Reliability and validation of the Turkish adaptation of the mistake rumination scale

Fedai Kabadayi[1] · Oğuz Mercan[2]

Abstract

The present study aimed to evaluate the validity and reliability of Turkish adaptation of the Mistake Rumination Scale (MRS) in university students. The study group consisted of 372 participants from different faculties, aged between 17 and 39 years and mainly female. We first translated Turkish of the MRS. Then, we analyzed the scale in terms of reliability and validity. The findings indicated that the MRS–Turkish Form confirmed seven items in one factor with good factor loadings. Good fit values were determined with the MRS–Turkish Form. The MRS–TF has good reliability coefficients. The mistake rumination was moderately positively correlated with ruminative thought styles and moderately negatively correlated with cognitive control and flexibility. These results demonstrated that the MRS–Turkish Form can be validly and reliably performed to Turkish culture.

Keywords Mistake rumination scale · Turkish culture · Perfectionism · Adaptation

Introduction

The term of rumination is a noteworthy concept in recent years. The increase in research on rumination is remarkable. Rumination has been defined in different forms, especially in the historical context, and has been fed from different theoretical structures (Kashdan & Roberts, 2007; Martin & Tesser, 1996; Nolen-Hoeksema, 2004; Trapnell & Campbell, 1999). These theories define rumination in different ways and rumination is measured differently in different structures (Yang et al., 2020). In addition, while the conceptual framework expands rapidly in Western countries, it requires patience the concept in countries such as Turkey. The introduction to developing countries of the theoretical structures of concepts and the adaptation of concept-related measurement instruments require a certain process.

There are different theoretical structures related to defining and explaining rumination. Although there are different definitions and explanations about rumination, it is seen that rumination measurements related to a specific context have come to the fore in recent years. The grief rumination (Eisma et al., 2014; Tang et al., 2019) that individuals experience with regard to a certain loss is an example of rumination in different situations. However, anger rumination is another (Quan et al., 2020; Ramos-Cejudo et al., 2017; Sukhodolsky et al., 2001). Finally, mistake rumination (Flett et al., 2020a) is the main topic of the present study, which also describes rumination that occurs in a specific situation. Especially in the current literature, the term of mistake rumination is striking.

Definition of Mistake Rumination

Cognitive activation can have different forms (Stoeber, 2017). One of these forms is mistake rumination. Mistake rumination refers to mistakes that most people would not consider to be crucial, but that is significantly magnified by the person who cannot face past mistakes (Flett et al., 2020a). The concept of mistake rumination was presented by Frost and Henderson (1991). In their study, they examined the relationship between the responses of competing female athletes competitions and the reactions of the coaches to mistakes made during the competition within the structure of perfectionism. In the following

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years, the importance of rumination about mistakes in daily life was often discussed. For example, in one of these studies (Frost et al., 1997), it was found that individuals ruminate more for mistakes that they think are important. At the same time, studies have also been carried out to find that mistake ruminations have a theoretical structure. This structuralizing is built on the theory and research developed by Flett et al. (1998).

Mistake rumination increases an avoidance orientation, delay and delay tendencies triggered by short memories of the past (Flett et al., 2020a). Similarly, the presence of contradictory propositions can cause rumination and stress (Ingram, 1990). In addition to these concepts, rumination is mostly studied within the concept of perfectionism. Perfectionism was defined in early studies as a fear of failure brought on by low self-esteem (Ellis, 1962; Missildine, 1963). In the following years, the definition of perfectionism has expanded structurally to include concepts such as personal standards, doubts about events and worrying about mistakes (Frost et al., 1990). Conceptually, mistake rumination can be expressed as an element of perfectionism cognition theory. Perfectionism is associated with a permanent and long-term rumination (Flett et al., 2018) and symbolizes a life approach that does not only make stress and failures more disturbing and frustrating, but also increases the likelihood of mistake occurrence (Flett & Hewitt, 2002).

Theoretical Background and Perfectionism

Perfectionism related studies have increased in the last 30 years (Curran & Hill, 2019). Perfectionism has no accepted common definition therefore there are various theoretical models and approaches to perfectionism (Ellis, 2002; Flett et al., 2018). These approaches conceptualize perfectionism as multi-dimensional (Gaudreau & Thompson, 2010; Hewitt & Flett, 1991; Stöber, 1998). Also, some of these approaches emphasize the positive and negative aspects of perfectionism (Stoeber & Otto, 2006; Terry-Short et al., 1995). Along with these approaches the concept of mistake rumination has evolved from the perfection cognition theory. The version of perfectionism cognition theory has some principles. First, perfectionism is linked to a longer, faster, and more frequent rumination experience. Second, there is a wide variety of thoughts. Third, perfectionism involves excessive cognitive preoccupation, the tendency to remember unsuccessful experiences, and the greater inclusion of memories from failed events (Flett et al., 2018).

More clearly, perfectionism can have positive consequences for setting high standards, and negative consequences for endless efforts to perfection. In the theory of perfectionism, the individual's effort to be perfect is basically evaluated as perfectionism. Perfectionists individuals want their lives to be perfect in all aspects (Flett & Hewitt, 2006). Pursuing high standards with a perfectionist attitude and wanting the best of everything has some negative consequences. It requires a demanding path in a continuous effort. This situation has negative effects on the psychological health of the individual. Because these standards are often too high for individuals to achieve and are not realistic (Hewitt et al., 2017). Perfectionist individuals have an idealized self-structure regarding themselves or others due to their irrational thoughts (Flett et al., 1991a). The individual's perfectionist cognitions will turn into actions that require more cognitive engagement and effort regarding the ideal self-structure. The difference between the individual's self-structure and ideal self-structure will rise (Flett et al., 2018).

In correlational studies on perfectionism, it was determined that the perfectionist nature of the individual was positively associated with high self-expectation, approval demand, dependence, blame tendency, anxiety (Flett et al., 1991a), and self-generated stress (Flett et al., 2020a). Individuals with high levels of perfectionist traits had high neuroticism and relatively poor physical health, psychological health, psychosocial resources, and well-being traits (Molnar et al., 2020). Lastly, perfectionism is negatively related to self-actualization (Flett et al., 1991b). Also, socially prescribed perfectionism was related significantly to increased levels of suicide potential (Hewitt et al., 1992).

Measuring the Mistake Rumination

In the perfectionism literature, cognitive rumination on mistakes and imperfections has been frequently mentioned (Flett et al., 2016; Flett et al., 2018; Flett et al., 2002; Frost & Henderson, 1991; Frost et al., 1997; Guidano & Liotti, 1983). Accordingly, measurement instruments aiming to measure rumination have been developed. Ruminative Thought Style Questionnaire (Brinker & Dozois, 2009) and Rumination About an Interpersonal Offense Scale (Wade et al., 2008) are two of them. However, these measurement instruments do not focus on the mistakes people make in real life. The Mistake Rumination Scale (MRS) was developed to fill this gap in the literature and support other measurement instruments related to rumination (Flett et al., 2020a).

MRS aims to measure the disposition to think about a personal mistake in the past. This scale consists of a factor with high reliability and seven items. It was concluded that the scores obtained from the MRS significantly predicted depression scores along with perfectionism and automatic thoughts (Flett et al., 2020a). It is also stated that focusing on mistake rumination represents a convenient way of expanding research and theory on social anxiety as well as perfectionism (Flett & Hewitt, 2014).

Turkish Scales Related to Rumination

There are some other scales related to rumination in Turkish (Altan-Atalay et al., 2020; Erdur-Baker & Bugay, 2010; Oral & Arslan, 2017). The first of these scales is the Ruminative Responses Scale adapted to Turkish by Neziroğlu (2010). This measurement instrument measures the rumination tendencies of people regarding negative events. It was found to be a reliable (Cronbach Alpha (α) = .77) measurement instrument adapted for university students (Neziroğlu, 2010). Another rumination scale is related to ruminative thought style (Karatepe et al., 2013). The structure in the scale treats rumination as a cognitive process independent of psychopathologies and is a reliable (Cronbach Alpha (α) = .91) measurement instrument that can be applied in clinical or non-clinical population (Karatepe et al., 2013). Metacognition related to rumination have been adapted in another scale for the Turkish culture (Esin-Yilmaz et al., 2014). In measuring, the instrument can be considered reliable with positive and negative dimensions and rumination is measured in both clinical and non-clinical population (Esin-Yilmaz et al., 2014). As a result, the reliability coefficients of the scales related to rumination generally have good reliability values (Esin-Yilmaz et al., 2014; Karatepe et al., 2013; Neziroğlu, 2010).

Aim of the Present Study

In Turkey, there are several measurement instruments for different rumination structures. However, it is seen that the studies on the measurement of rumination are still in the development stage. Rumination studies has a history of approximately 10 years in Turkey. This demonstrates that researchers and mental health practitioners do not benefit sufficiently from the rumination-related measurement instruments and concepts in Turkey. By providing measurement instruments for rumination, there is a need to correct this deficiency. Thus, in research, case study, therapy and counseling in Turkey, researchers and mental health practitioners can use the brief, reliable, valid the Mistake Rumination Scale. It will also encourage the adaptation of the scale in other countries where the concept has expanded.

The aim of the present study is to translate the Mistake Rumination Scale from English to Turkish and to show its reliability and validity in university students. We sought to a) complete the translation process b) assess the language validity of scale c) confirm the factor structure d) assess the criterion validity. It is known that the Ruminative Thought Style Questionnaire (Karatepe et al., 2013), Ruminative Response Scale (Neziroğlu, 2010), and Self-Critical Rumination Scale (Kocalar, 2019) are already adapted to the Turkish language. These scales aim to measure thoughts about rumination but do not include any evaluation of mistake rumination. Adaptation of MRS will provide

diversity in measuring the concept of rumination and will also be an effective assessment instrument for studies that specifically address the concept of mistake ruminations. At the same time, we also investigate the relationship between mistake rumination, cognitive control and flexibility, and ruminative thought. Exploring possible relationships within cognitive structures may allow us to better understand the structure of mistake rumination.

Method

Participants

The sample consisted of 372 (281 female, 91 male) Turkish university students. The ages of the participants ranged between 17 and 39 (mean = 22.03, sd = 2.74). 290 (75.3%) participants are university students and 92 (24.7%) new graduates. 70 (18.1%) were from first grade, 63 (16.9%) were from second grade, 62 (16.7%) third grade, 72 (19.4%) were fourth grade, and 13 (3.5%) were from fifth grade. Participants were registered in different faculties (mostly faculty of education). To participate in this survey, it is necessary to be a university student or new graduate.

Procedure and Data Collection

First, the corresponding author sent an e-mail for Turkish adapting MRS to Gordon Flett. Second, all the permissions were taken from the Research Ethics Committee of Recep Tayyip Erdogan University. Third, the researchers shared the questionnaire links with the students. Participants filled the questionnaires online using Google Forms. All participants provided Informed Consent using Google Forms. All participants declared that the participation in the research was voluntary. We announced that we will donate 3 saplings on behalf of 3 of the participants who answered this questionnaire to the TEMA foundation (The Turkish Foundation for Combating Soil Erosion, Reforestation, and the Protection of Natural Habitats). Participants who wished to participate in the draw provided their e-mail addresses with the questionnaires. After the data collection process was completed, we donated 3 saplings on behalf of 3 participants.

Instruments

The Mistake Rumination Scale (MRS) The original version of the MRS was developed (Flett et al., 2020a). The scale consists of seven items and one dimension. The MRS measures the ruminative thinking characteristics of some important mistake individuals have made in the past, which included cognitive structure of perfectionism. Item examples include "*To what extent do you still think about the mistake and wish it had*

gone better?" and "*To what extent did you think Why do I make mistakes that other people don't make?*". The scale is a 4-point Likert type (1 = not at all, 4 = very much). Cronbach Alpha (α) value is .84 in the first sample and .85 in the second sample. Item factor loadings of the scale are minimum .55 for the first sample and minimum .50 for the second sample. Confirmatory factor analysis (CFA) values of the scale are χ^2 (14) = 21.86, CFI = .99, TLI = .98, SRMR = .03 and RMSEA = .04 for the first sample, and χ^2 (14) = 44.56, CFI = .95, TLI = .92, SRMR = .04, RMSEA = .10 for the second sample (Flett et al., 2020a).

The Cognitive Control and Flexibility Questionnaire (CCFQ) The original version of the CCFQ was developed (Gabrys et al., 2018). The Turkish version of the CCFQ was adapted by Demirtaş (2019). The scale consists of 18 items and two sub-dimensions. The scale measures individuals' flexibility to evaluate and cope with emotional control over emotions in stressful situations. The scale is a 7-point Likert type (1 = I totally disagree, 7 = I totally agree). Cronbach Alpha (α) values are between .85 and .91. Item factor loadings of the scale are between .48 and .81. CFA values are χ^2 / df = 2.63, NFI = .94, CFI = .96, GFI = .86, AGFI = .82, IFI = .96, SRMR = .07 and RMSEA = .08 (Demirtaş, 2019).

Ruminative Thought Style Questionnaire (RTSQ) The original version of the RTSQ was developed (Brinker & Dozois, 2009). The Turkish version of the RTSQ was adapted by Karatepe et al. (2013). The scale consists of 20 items and one dimension. The scale measures the ruminative thinking for individuals including all population. The scale is a 7-point Likert type (1 = does not describe me at all, 7 = describes me the best). The RTSQ explains 63.43% of the total variance. Cronbach Alpha (α) value is .91 (Karatepe et al., 2013).

Adaptation Process

There are some steps in the translation process of the scale. In the first step, it was translated into Turkish by 5 experts (3 experts from Department of Counseling and Guidance and 2 from Department of English Language Teaching) with high proficiency in English. Second, back translation was made by 6 experts (4 experts from Department of Counseling and Guidance and 2 from Department of English Language Teaching) and then the best translations for the items in question were suggested. The researchers decided to finalize the scale with the translations of the items in line with the suggestions. Thus, the draft MRS–TF was ready for data process.

Data Analysis

The analysis of adaptation studies includes some systematic steps. We systematically followed the steps in the present study. First, we performed Pearson's correlation for concurrent validity with pilot study. Second, we analyzed the reliability of the scales. Third, the assumptions of the confirmatory factor analysis (sample size, missing value, outliers, normality) were analyzed (Tabachnick & Fidell, 2013). All assumptions checked and approved before the CFA. There was good sample size. Also, multivariate outliers and missing values were examined. We verified the factor structure using CFA. Fourth, we reported the findings of network analysis as additional evidence to the CFA. Fifth, the relationships between mistake rumination, cognitive control and flexibility, and ruminative thought styles were studied for criterion validity with Pearson's correlation. We performed data analysis using SPSS 18 (SPSS PASW, 2009), LISREL 8.8 (Jöreskog & Sörbom, 2006), and JASP 0.14.1 (Love et al., 2019).

Results

Descriptive Statistics

Descriptive statistics of the present study were analyzed. There was no missing value in the dataset. Skewness and Kurtosis should be in the range of −1 and + 1 (Büyüköztürk et al., 2015). All data of instruments was checked for the normality and it was determined that the measures have met the criteria (see Table 1).

Concurrent Validity

In the pilot study, 31 bilingual participants answered the original form of the scale. Participants answered the Turkish form after 2 weeks. And then, the correlations between original and the Turkish scale were analyzed. The statistical findings between the original MRS and MRS–TF is given in Table 2. The Pearson correlation between the two measurements was found to be extremely high (r = .79, $p < .01$) (Arney, 1990).

After the pilot study, concurrent validity, confirmatory factor analysis, network analysis, reliability and criterion validity stages were followed in the scale adaptation process.

Table 1 Descriptive statistics

Measures	α	ω	Mean	Sd	Range	Skewness	Kurtosis
MRS–TF	.82	.82	18.64	4.65	7–28	.05	−.83
RTSQ	.94	.94	98.63	23.71	30–140	−.56	−.27
CCFQ	.91	.90	77.06	17.91	32–126	.16	−.15

N = 372

Table 2 Pearson correlation between original and Turkish form

Measures	Mean	Sd	Range	Skewness	Kurtosis	Pearson correlation
MRS	14.93	4.13	10–25	.87	−.05	.79**
MRS–TF	14.67	3.63	10–23	.60	−.46	

** $p < .01$, $N = 31$

Reliability

In recent years, McDonald's Omega (ω) coefficient (McDonald, 1999) is reported together with the Cronbach Alpha (α) (Cronbach, 1951), which is frequently reported in reliability (Hayes & Coutts, 2020). In the present study, we calculated the Cronbach Alpha (α) and McDonald's Omega (ω) coefficients using JASP. The reliability of all of the scales was calculated. The MRS–TF shows a Cronbach Alpha (α) = .82. RTSQ and CCFQ show excellent Cronbach Alpha (α) = .94, and α = .91. McDonald's Omega (ω) value was calculated as .82 [95% CI (.79 and .85)] for MRS–TF, .94 [95% CI (.94 and .95)] for RTSQ and, .90 [95% CI (.88 and .91)] for CCFQ (see Table 1).

Confirmatory Factor Analyses of the Turkish Version

CFA was performed with LISREL 8.8 software to evaluate the model fit of the MRS–TF. CFA is provided with maximum likelihood estimation. A one-factor model of MRS–TF was tested with the seven items. The results are as follows: $\chi^2 = 61.64$, df = 14, GFI = .95, AGFI = .91, CFI = .96, SRMR = .04, TLI = .94, NFI = .95, IFI = .96, RMSEA = .09, Confidence Interval = [0.07, 0.12], $p_{close} = .001$. We made one modification between Item 2 and Item 4 after evaluating the model fit. Results after modification are as follows: $\chi^2 = 42.24$, df = 13, GFI = .97, AGFI = .93, CFI = .98, SRMR = .03, TLI = .96, NFI = .97, IFI = .98, RMSEA = .07, Confidence Interval = [0.05, 0.10], $p_{close} = .001$ can be used as a criterion. The criteria of GFI and CFI ≥ .95, which was perfect; AGFI ≥ .90, which was good; RMSEA ≤ .09, which was adequate; SRMR ≤ .05, which was perfect (Kelloway, 1998) and the criteria of TLI ≥ .90, which was acceptable (Schumacker & Lomax, 2016); NFI ≥ .95, which was perfect (Schermelleh-Engel et al., 2003). A valid fit was confirmed on the 7-item MRS–TF with a one factor. All items had factor loadings of .46 or higher and it was similar to the factor loadings in the original scale (see Table 3).

Network Analysis

With the network analysis, we aimed to identify the data better, to make predictions about the direction and strength of the relationships between the items, and to provide information about the factor structure as an alternative to CFA. JASP 0.14.1 software was used for network analysis (see Fig. 1).

Figure 1 showed that no items are centralized, and the items are suitable for a single factor structure in parallel with the confirmatory factor analysis results. Item 4 has the highest betweenness score (Item 4 = 1.60). Also, Item 2 has the highest closeness score (Item 2 = 1.24). Moreover, the high strength score was for Item 4 (1.17). All findings are presented in Table 4.

Criterion Validity

The relations among the variables mistake rumination, ruminative thought style, cognitive control and flexibility were analyzed using Pearson correlations (see Table 5). Mistake rumination was found positively correlated with ruminative thought style ($r = .53$, $p < .01$). Moreover, mistake rumination was found negatively correlated with cognitive control and flexibility ($r = −.35$, $p < .01$).

Gender Differences on Mistake Rumination

We analyzed gender differences on the mistake rumination using independent t-test. The results showed that females had more mistake rumination than males ($t = −2.26$, $p < .05$) (see Table 6).

Table 3 Factor loadings of the original MRS and MRS–TF

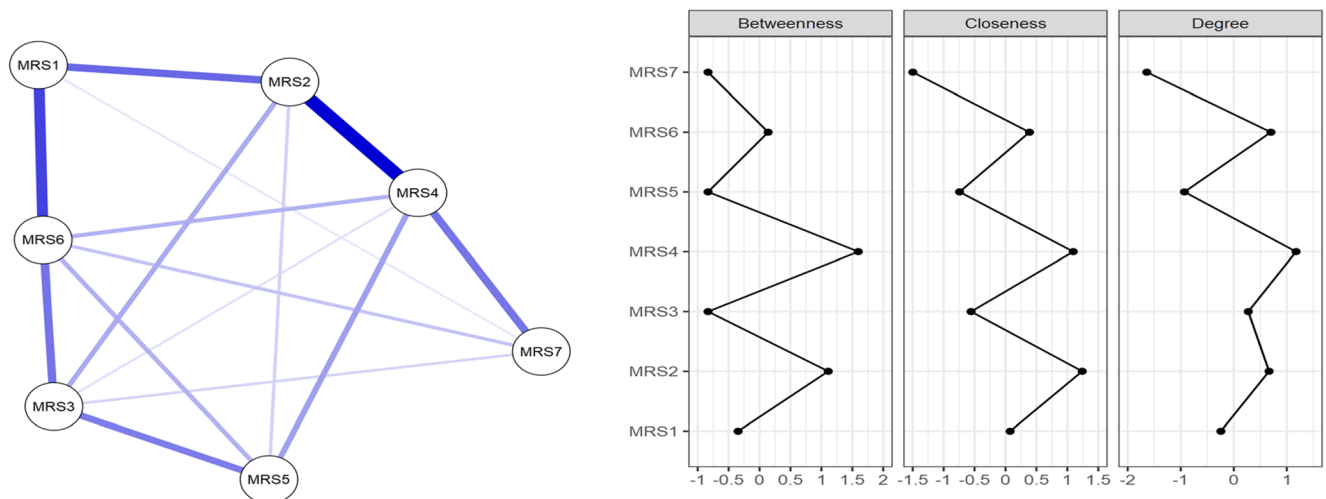| Items	Original MRS		MRS–TF	
	Sample 1	Sample 2	Sample	
			Without modification	Modification
Item 1	.61	.76	.63	.65
Item 2	.74	.63	.72	.66
Item 3	.65	.79	.67	.69
Item 4	.70	.71	.70	.64
Item 5	.63	.66	.56	.57
Item 6	.73	.66	.68	.71
Item 7	.55	.50	.47	.46

Fig. 1 Network Analysis of MRS–TF. *Note.* Network structure of MRS–TF (left panel) and centrality indices (right panel)

Discussion

The aim of present study was to adapt the Mistake Rumination Scale for Turkish Form in university students. The scale is based on the theory of cognitive perfectionism to determine the rumination of individuals about some specific situation or mistake (Flett et al., 2020a). The present study was carried out step by step. First, was the concurrent validity analysis and very strong correlation was found between the Turkish and English forms of the scale (r = .79, p < .01).

Secondly, the factor structure was tested by CFA. The one-dimensional 7-item Turkish Form was confirmed as similar to the original MRS. The data was verified without the need for any modifications as a result of the CFA. However, with a modification process between item-2 and item-4, the fit indices increased considerably. The modification indices suggested that there was covariance between Item 2 (*"To what extent did you think "Why can't I stop making mistakes like this?""*) and Item 4 (*"To what extent did you think "Why do I make mistakes that other people don't make?""*). It is stated that individuals with high perfectionism orientation can think of mistakes because they cannot accept or prohibit the mistakes made by others (Flett et al., 2020a). Thus, we made a

modification between Item 2 and Item 4 can be explained in the context of the theoretical basis. All items in the Turkish Form have factor loadings of more than .46. Factor loadings should perform at a minimum of .30 (Seçer, 2015). Factor loads for MRS–TF are above .30. Also, the factor loadings obtained in each item are quite parallel to the factor loadings in the original scale. The current factor loadings provide evidence for construct validity. Moreover, the MRS–TF had good reliability coefficients (Cronbach Alpha (α) = .82 and McDonald's Omega (ω) = .82). A limit of .70 is generally accepted for the reliability. Also, looking at the reliability in the original scale, the findings of the reliability were very close to each other. The results of Cronbach Alpha (α) and McDonald's Omega (ω) provided evidence of reliability for MRS–TF. These psychometric findings showed that the Turkish Form of the scale is a valid and reliable instrument. It can be said that the MRS–TF reliability value is similar to the reliability values of Turkish scales related to rumination.

Third, network analysis findings are presented in a supportive manner rather than as an alternative to confirmatory factor analysis findings. Network analysis provides researchers to visually examine item distribution and facilitates the evaluation of the structure of the scale (Suwartono & Bintamur, 2019). Furthermore, network analysis results showed that MRS–TF items are not centralized in the present study. The

Table 4 Centrality measures per items

Items	Betweenness	Closeness	Strength
Item 1	−.35	.07	−.24
Item 2	1.11	1.24	.67
Item 3	−.83	−.56	.27
Item 4	1.60	1.10	1.17
Item 5	−.83	−.74	−.93
Item 6	.14	.39	.70
Item 7	−.83	−1.50	−1.64

Table 5 Correlations among mistake rumination, ruminative thought style and cognitive control and flexibility

Measures	1	2	3
1. Mistake rumination	–		
2. Ruminative thought style	.53*	–	
3. Cognitive control and flexibility	−.35*	−.45*	–

*p < .01

Table 6 Gender differences on mistake rumination

Gender	M	SD	$t_{(340)}$	p	Cohen's d
Male	17.69	4.46	−2.26	.025*	−.27
Female	18.95	4.69			

*$p < .05$

findings also provided additional evidence that the substances showed the one-factor structure.

Fourth, Pearson correlation with equivalent scales was examined. Mistake rumination and ruminative thought styles were moderately positively correlated ($r = .53$, $p < .01$). Moreover, mistake rumination and cognitive control and flexibility were moderately negatively correlated ($r = −.35$, $p < .01$). In the previous study, mistake rumination was positively correlated with perfectionistic cognitions, social anxiety, social phobia, depression, procrastination, socially prescribed perfectionism, self-oriented perfectionism, brooding, whereas negatively correlated with self-compassion (Flett et al., 2020a). The findings of our study are in line with the previous results when compared with previous findings. The correlations between mistake ruminations, ruminative thought styles, and cognitive control and flexibility scores is enough to provide evidence for criterion validity.

Fifth, the results showed that females had more mistake rumination than men, although small effect size in this study. In the original study, there were two separate findings related to gender differences on mistake rumination. In sample 1 there were no gender differences despite in the study 2 females had higher mistake rumination than men (Flett et al., 2020a).

The MRS–TF can also be useful for the researchers or mental health practitioners to measure the rumination related to a specific mistake. There are scales that can be used to measure various psychometric properties in the Turkish culture. Particularly, there exist Utrecht Grief Rumination Scale (Tekin & Kırlıoğlu, 2019), Co-rumination Questionnaire (Bugay & Erdur-Baker, 2015), Work-Related Rumination Scale (Sulak-Akyüz & Sulak, 2019), and Rumination about an Interpersonal Offense Scale (Oral & Arslan, 2017). Utrecht Grief Rumination Scale measures grief rumination, defined as repetitive thoughts about the negative feelings about the causes, consequences of a death or loss (Tekin & Kırlıoğlu, 2019). Co-rumination Questionnaire measures rumination in close relationships (Rose, 2002). Work-Related Rumination Scale measures employees' ruminative thoughts about work (Sulak-Akyüz & Sulak, 2019). Rumination about an Interpersonal Offense Scale measures rumination related to problems they experience in interpersonal relationships in university students (Oral & Arslan, 2017). MRS–TF measures the rumination of a particular mistake associated with individuals' perfectionism. As a result, MRS–TF will fill an important gap in measuring the rumination related to a specific

mistake in Turkish culture. Moreover, it is worthwhile to be able to measure the problems between people with MRS–TF, work-related problems, and even other mistakes in the life of the individual (mistakes made by athletes, politicians, etc.).

Limitations

This scale adaptation study has several limitations. First, test-retest validity and cross-validation could not be tested in the present study. Second, we preferred confirmatory factor analysis while analyzing the one factor mistake rumination structure in the original scale. Because the purpose of the research was to verify the one-dimensional original structure (Flett et al., 2020a) for university students in Turkish culture. Third, the participant group mainly consists of females. In future studies, the participant group may be more homogeneous for gender differences on mistake rumination. Forth, the Mistake Rumination Scale is quite new in the literature. There is no research on adapting the scale to other cultures. Therefore, we could not find the opportunity to compare findings obtained in other cultures in the present study. This paper will provide a process-related contribution to the adaptation of the MRS in the following different cultures.

Conclusion

This scale adaptation study contributes to the expansion of the mistake rumination to different cultures. We have obtained several evidences of adaptation of the scale. The MRS–TF consisting of seven items with one dimension showed reliable values. Moreover, one of the results of the present study is that the scale is above the least acceptable limits in the scale verified as a result of the confirmatory factor analysis.

Turkish researchers and mental health practitioners can easily and practically apply the MRS–TF in their research and psychotherapy, counseling, and case studies. Also, MRS–TF may be preferred in a randomized controlled trial experiment aimed at reducing the mistake rumination scores of individuals with high mistake rumination due to certain past mistakes. Moreover, The MRS–TF can be re-analyzed with different sampling styles in future studies. Specifically, validity and reliability studies of the scale can be tested in clinical populations. Furthermore, investigating the MRS–TF on a specific mistake can provide important data in future studies. Replications studies also need to test-retest validity and cross-validation.

This Turkish form has similar psychometric properties with the original scale. On the other hand, although we tested the one-dimensional mistake rumination structure in this study, it may be suggested in future studies to test whether the original structure can be transformed into more than one factor. It can also be encouraging to work on adapting the scale to other languages. Although there is a limitation in the present study

due to the lack of comparison for adaptation studies in different cultures, the present study may be a suitable adaptation study for comparison in future adaptation studies.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12144-021-01972-5.

Data Availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical Approval This study was approved by the Research Ethics Committee of Recep Tayyip Erdogan University (2020/25).

Declaration of Conflicting Interests The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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