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Intolerance of Uncertainty Inventory Development: Validity and Reliability Study

İlknur Ezgi KOSER[1], Yücel ÖKSÜZ[2], Şevki KOLUKISA[3]

[1]*Giresun Üniversitesi, Psikolojik Danışma ve Rehberlik Araştırma ve Uygulama Merkezi*
[2] *Giresun Üniversitesi, Eğitim Bilimleri Bölümü, Rehberlik ve Psikolojik Danışmanlık A.B.D.*
[3]*Giresun Üniversitesi, Spor Bilimleri Fakültesi, Antrenörlük Eğitimi Bölümü*

Abstract

This study an attitude scale designed to measure intolerance to uncertainty in adultsThe objective was to develop a scale that accurately measures the level of intolerance to uncertainty among adults. Initially, the scale comprised 20 items. However, based on exploratory factor analysis and expert opinion, three items were removed. The refined scale emerged with four dimensions, which together accounted for 72.66% of the variance across 17 items. These four dimensions: "Control," "Doubt," "Anxiety," and "Fear," were identified through both literature review and explanatory factor analysis of intolerance to uncertainty. The revised scale, structured with four sub-dimensions, was designed according to a Likert measurement scale. Confirmatory factor analysis indicated that the scale is acceptable and exhibits good fit values. T-test values for the factors ranged from 11,67 to 17,24. Additionally, item-total and correlation analyses between factors were conducted, yielding meaningful results. Reliability calculations revealed a Cronbach's Alpha coefficient of 0.93, indicating high reliability. Consequently, the 17-item Intolerance of Uncertainty Inventory is a valid and reliable tool for measurement.

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Belirsizliğe Tahammülsüzlük Envanterinin Geliştirilmesi: Geçerlik ve Güvenirlik Çalışması

Öz

Bu araştırmada, yetişkinlerin belirsizliğe tahammülsüzlük düzeylerini ölçecek nitelikte bir tutum ölçeğinin geliştirilmesi amaçlanmıştır. Ölçeğin taslak formunda 20 madde yer almaktadır. Açımlayıcı faktör analizi ve uzman görüşüyle birlikte ölçekten 3 madde atılmıştır. 17 maddenin varyansın %72,66'sını açıklayan dört faktörlü bir ölçme aracı elde edilmiştir. "Kontrol etme," "Şüphe," "Kaygı" ve "Korku" olarak adlandırılan bu dört boyut belirsizliğe tahammülsüzlük ile ilgili yapılan literatür taraması ve açımlayıcı faktör sonucunda elde edilmiştir. Dört alt boyutlu bu ölçek likert ölçme aracına uygun halde hazırlanmıştır. Doğrulayıcı faktör analizleri yapılmış ve çıkan sonuçlar ölçeğin iyi uyum değerlerine sahip, kabul edilebilir olduğunu göstermiştir. Faktörlerin t değerleri hesaplanmış ve 11,67 ile 17,24 arasında değişmektedir. Madde toplam analizi ve faktörler arası korelasyon analizi uygulanmış ve analizlerin sonuçlarının anlamlı olduğu bulunmuştur. Güvenirlik hesaplamaları sonucunda ölçeğin tamamı için Cronbach Alpha güvenirlik katsayısı, 93 bulunmuştur. Elde edilen bulgular, 17 maddeden oluşan Belirsizliğe Tahammülsüzlük Envanteri'nin geçerli ve güvenilir bir ölçme aracı olduğunu göstermiştir.

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Anahtar kelimeler*: Belirsizliğe tahammülsüzlük, Envanter, Geçerlik, Güvenirlik*

Sorumlu Yazar: Şevki KOLUKISA
e-mail: sevki.kolukisa@giresun.edu.tr

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INTRODUCTION

Daily life is often filled with uncertainties, from to control time to the unpredictability of nature and the actions of others. Humans naturally seek to reduce uncertainty, even if it means accepting negative truths. The Turkish Language Association defines uncertainty as “nebulousness, imprecision, and vagueness” (Türk Dil Kurumu, 2022). Budner (1962) categorized uncertainty into three types: Novelty (new situation without familiar clues), Complexity (situations with many confusing clues), and Insolubility (situation with contradictory clues). Uncertainty is associated with unpredictability, ambiguity, and uncertainty (Grupe & Nitschke, 2013).

The concept of intolerance to uncertainty was introduced by Frenkel-Brunswik (1949), who suggested that the discomfort experienced by individuals in uncertain situations could be a personality trait. However, Budner (1962) argued that perceiving uncertainty negatively is a more functional explanation than personality traits alone (Grenier et al., 2005). For example, one person might find a situation "disturbing" while another might not, even if the odds and consequences are the same. This difference in reaction highlights varying intolerance thresholds for uncertainty.

Intolerance to ambiguity involves overthinking and finding experiences unacceptable, regardless of their likelihood. Individuals with high tolerance to uncertainty struggle with emotional fluctuations and stress, intensifying their discomfort. They attempt to reduce uncertainty, which often increases emotional arousal and stress (Dugas et al., 2001). Conversely, individuals with a low intolerance to uncertainty can manage negative situations more effectively.

However, daily life is replete with uncertainties (Dugas et al., 2001). Individuals respond to stimuli on two levels: factual and functional levels. The factual level pertains to individual perceptions and emotions, while the functional level involves interactions with natural and social objects in the external world (Higgins, 2000). These reactions arise from both the inner and outer worlds of an individual. While individuals process internal perceptions, evaluations, and feelings, they simultaneously interact with their external environment.

To measure an individual's tolerance or intolerance of uncertainty, it is necessary to observe behaviors at both levels. Responses to threat stimuli are classified into “submission” and “denial.” If an individual exhibits any of the following behaviors: factual submission (anxiety and restlessness), factual denial (repression and denial), operational denial (destructive behavior or constructive behavior), or operational submission (avoidant behavior), it indicates a perceived threat. “submissiveness” involves accepting one’s inability to change events, while “denial” involves altering objective reality to fit personal desires (Budner, 1962). Therefore, if these behaviors are observed, the individual may perceive a threat. High intolerance to uncertainty is inferred if these behaviors occur in situations characterized by novelty, complexity, or insolubility (Budner, 1962).

The prospective dimension, the first factor in intolerance of uncertainty, relates to the desire to predict one’s situation. The desire for predictability increases anxiety and prompts

individuals to seek more information about their circumstances (Hirsh et al., 2012). Research has shown that individuals with high intolerance to uncertainty are more likely to conduct extensive research to alleviate health concerns and seek information from health institutions, such as brochures (Rosen & Knäuper, 2009). This tendency indicates that people often seek additional information to reduce anxiety rather than avoid the situation.

The inhibiting dimension of intolerance of uncertainty can lead to a condition known as Uncertainty Paralysis. Studies have linked Uncertainty Paralysis, which defines the inhibitory dimension, to mental disorders characterized by avoidance behavior. The cognitive, psychological, and emotional consequences of intolerance to uncertainty significantly impact adaptive coping behaviors due to high threat perception, problem-focused coping, cognitive avoidance, and overestimation of negative consequences (Anderson et al., 2019). Individuals with high intolerance to uncertainty often exhibit low self-control in threatening situations and rely more on emotion-focused coping strategies than problem-solving methods. Intolerance of uncertainty is considered a core aspect of anxiety, with anxiety often serving as a dysfunctional strategy for managing or preventing negative outcomes rather than resolving undesirable situations (Freeston et al., 1994).

Uncertainty is an inherent part of life. The critical factors are how uncertainty affects individuals, how they cope with it, and how they manage uncertainty in their lives. Without appropriate coping strategies, undesirable outcomes may arise (Han et al., 2020). The literature suggests that intolerance of uncertainty can negatively impact an individual's psychology (Sarı & Dağ, 2009). Numerous studies have demonstrated that it can create a perception of threat, leading to anxiety, fear, and worry. Anxiety often aims to reduce feelings of uncertainty about future situations, and significant associations have been found between intolerance of uncertainty, anxiety, and generalized anxiety disorder (Dugas et al., 1997). The cognitive, psychological, and emotional consequences of intolerance of uncertainty impact adaptive coping behaviors, including high threat perception, problem-focused coping, cognitive avoidance, and overestimation of negative consequences (Bredemeier & Berenbaum, 2008). Viewing problems negatively, and interpreting them as threats rather than challenges, can result in avoidance rather than problem-solving (Davey, 1994). Those with a high intolerance of uncertainty typically exhibit lower self-control in threatening situations and prefer emotion-focused coping strategies over problem-solving methods. Intolerance of uncertainty is a fundamental aspect of anxiety, often used as a dysfunctional strategy to prevent or manage negative consequences instead of resolving the actual situation (Freeston et al., 1994).

Upon reviewing the literature, it is evident that the long form of the Intolerance of Uncertainty Scale was developed by Freeston et al. (1994). This scale consists of 27 items and was later adapted to Turkey by Sarı and Dağ (2009), who conducted a validity and reliability study. The internal consistency of the adapted scale was found to be 0.91, while the test-retest reliability was 0.66. Subsequently, Carleton et al. (2007) developed a short form of the Intolerance of Uncertainty Scale, based on the original scale by Freeston et al. This short form consists of 12 items and was also adapted to Turkey, with validity and reliability studies conducted by

Sarıçam et al. (2014). The internal consistency of this adaptation was reported as 0.88, and the test-retest reliability was found to be 0.74.

The Attitude Against Uncertainty Scale, which was directly developed in Turkey, was created by Ersanlı and Uysal (2015). The scale has a single-factor structure and demonstrated an internal consistency of 0.89.

The literature shows that most scales used to measure intolerance of uncertainty levels have been adaptations to Turkey (Dağ & Sarı, 2009; Sarıçam et al., 2014). Although adopting a valid and reliable scale from another language may be less labor-intensive, issues may arise due to translation inaccuracies or cultural differences, such as achieving exact measurement equivalence. Considering the need for a scale better suited to Turkish culture and capable of fully capturing the construct, the development of a new scale was deemed necessary.

Furthermore, existing literature indicates that the measurement tool developed directly in Turkish to measure intolerance of uncertainty consists of a single-factor structure (Ersanlı & Uysal, 2015). However, it is believed that developing a new scale that addresses intolerance of uncertainty with different sub-dimensions is appropriate under current conditions. Therefore, this study aims to develop a new Intolerance of Uncertainty Inventory, building upon previously developed scales. The validity and reliability of this newly developed scale were thoroughly evaluated.

METHOD

Study Group

Exploratory factor analysis was conducted on a sample of 574 students from a state university, and confirmatory factor analysis was conducted on a separate sample of 342 students.

Development of Measurement Tool

Item Pool Creation

To develop the Intolerance of Uncertainty Scale, a comprehensive literature review was conducted, analyzing items from existing inventories related to intolerance of uncertainty. Care was taken to ensure that the items covered cognitive, affective, and behavioral criteria and were both observable and measurable. Based on these criteria, 20 items were initially selected from the item pool and then reviewed by experts. Following the feedback, 3 items were removed, leaving a final set of 17 items. The inventory items were designed on a 5-point Likert scale, with response options ranging from "Not suitable for me at all" to "Completely suitable for me." The Likert scale is a common research tool for measuring attitudes and opinions (Tavşancıl, 2010).

Expert Review

A draft version of the inventory, consisting of 20 items, was evaluated by two experts in Turkish education and 10 faculty members specializing in measurement, evaluation, and psychological counseling and guidance. These experts evaluated the content, clarity, and

appropriateness of the items. Based on their feedback, 3 items were removed, resulting in a final draft with 17 items. The items were randomly ordered to prevent respondents from being influenced by similar items appearing consecutively.

Pilot Application

To ensure clarity and understanding, the scale was tested on two students at each grade level. The goal was to identify items that could cause misunderstanding among students. The feedback confirmed that items that students understood differently were similar to those suggested for removal by the experts. Thus, a 17-item scale was finalized for application.

Data Analysis

Construct Validity (Factor Analysis)

Construct validity refers to the degree to which the questions in a scale accurately measure the psychological traits to be measured (Büyüköztürk, 2017, p. 180). Factor analysis was used to reduce the number of related variables and the underlying structure among them (Kalaycı, 2018, p. 321). The draft inventory was administered to university students.

Exploratory Factor Analysis

Exploratory factor analysis (EFA) was used to explore the relationships among the variables. According to Pallant (2007, p. 179), EFA helps researchers gather preliminary information about these relationships. The 17-item Likert-type scale was administered to 574 students. The skewness (−0.523) and kurtosis (−0.538) values of the data met the criteria for normality because they fell within the acceptable range of −1 to +1 (Leech et al. 2005, p. 28).

Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was conducted to verify whether the factor structure identified in EFA applied to a different sample. Jöroskog and Sörbom (1993, p. 22) noted that CFA was used to test hypotheses based on previous research findings. The responses from 342 students on the 17-item scale were analyzed to confirm the factor structure.

Reliability Calculation

The reliability of the scale was assessed using Cronbach's Alpha internal consistency coefficient, which measures the consistency of items within a scale. According to Büyüköztürk (2012), a Cronbach's Alpha coefficient between 0.60 and 0.80 indicates good reliability, while a coefficient between 0.80 and 1.00 indicates high reliability. The Cronbach's Alpha for the entire Intolerance of Uncertainty Inventory was calculated at 0.933, indicating high reliability. The internal consistency coefficients for the sub-dimensions were as follows: 0.925 for "Control," 0.817 for "Doubt," 0.806 for "Anxiety," and 0.808 for "Fear." These results suggest that the items within each sub-dimension are consistent and accurately reflect the attitudes they are designed to measure. The results are detailed in Table 6.

Research Ethics Committee Approval

This study received approval from the Ethics Committee of Giresun University, with a decision dated November 2, 2022, and numbered 28/30.

FINDINGS

Findings Related to Construct Validity

In EFA, the sample size was considered sufficient. According to Field (2009, p. 641), Kaiser's criterion suggested that the sample should exceed 250 participants and that the Kaiser-Meyer-Olkin (KMO) measure should be equal to or greater than 0.6. In this study, the KMO value was found to be 0.969, indicating excellent sampling adequacy. To test the significance of the relationships within the correlation matrix, Bartlett's Test of Sphericity was employed, yielding a significant result ($\chi^2(820) = 12{,}839.806$, $p < 0.001$). These results suggest that the data are appropriate for EFA.

Principal Component Analysis (PCA) was used in EFA to determine the number of factors. Several criteria were considered, which are as follows:

1) Eigenvalue Criterion: Factors with eigenvalues of 1.0 or more were retained, as recommended by Field (2009, p. 640).

2) Scree Plot Analysis: the scree plot was examined to identify where the curve changes direction and levels off, indicating the number of factors (Pallant, 2007, p. 182). The vertical axis of the scree plot represents the eigenvalues, and the horizontal axis represents the factors. Factors with a steep slope followed by a flattening of the curve were considered significant (Büyüköztürk, 2017, pp. 135–136).

3) Percentage of Variance Explained: Factors were also evaluated according to the percentage of variance they explained. PCA was conducted with a varimax rotation to maximize the interpretability option in EFA. Items with factor loadings below 0.45, items with high cross-loadings of multiple factors, and items explaining less than 5% of the variance were excluded from the analysis.

4) Factor Loading Values: In factor analysis, it is recommended to retain variables with factor loadings of 0.32 and above (Tabachnick & Fidell, 2013, p. 654). In this study, a threshold of 0.45 was used, and items below this value were removed.

5) Difference in Loading Values: It was determined that the difference between the highest and next highest loading values of an item should be at least 0.10 (Büyüköztürk, 2017, p. 135). This criterion helped ensure that items were clearly associated with specific factors.

The varimax rotation method revealed a 4-factor structure, with each factor having an eigenvalue above 1 and collectively accounting for 72.663% of the total variance. Table 1 presents the EFA results.

Table 1. Exploratory factor analysis results

Scale Item No	Factor 1	Factor 2	Factor 3	Factor 4	Adjusted Article Total Correlation
	Control				
m1	0.800				0.787
m3	0.730				0.682

m6	0.732			0.700
m7	0.645			0.689
m17	0.668			0.611
		Doubt		
m4		0.744		0.554
m12		0.715		0.631
m13		0.647		0.550
m15		0.603		0.570
			Anxiety	
m5			0.706	0.521
m10			0.649	0.652
m14			0.642	0.546
m16			0.824	0.786
				Fear
m2			0.773	0.700
m8			0.741	0.700
m9			0.675	0.689
m11			0.643	0.611

When examining Table 1, it is observed that the factor loadings of the scale, which consists of 17 items, range from 0.800 to 0.576. Percentages of variance and total variances of factors are presented in Table 2.

Table 2. Percentages of variance and total variances of factors

Factors	Percentages of Variance (%)	Total Variances (%)
Factor 1: Control	28.935	28.935
Factor 2: Doubt	15.834	44.769
Factor 3: Anxiety	14.194	58.963
Factor 4: Fear	13.700	72.663

Upon examining Table 2, we found that the entire scale accounted for 72.633 of the total variance. The variance percentages for the scale's factors were also determined as follows:

1) Control Dimension: The "Control" dimension of the Intolerance of Uncertainty Inventory consists of 5 items. After applying the rotation method, the factor loading for these items ranged from 0.800 to 0.645. This dimension accounts for 28.935% of the variance.

2) Doubt Dimension: The "Doubt" dimension consists of 4 items, with factor loadings ranging from 0.744 to 0.603. This dimension explains 15.834% of the variance.

3) Anxiety Dimension: The "Anxiety" dimension also consists of 4 items, with loadings ranging from 0.706 to 0.642. It accounts for 14.194% of the variance.

4) Fear Dimension: The "Fear" dimension consists of 4 items as well, with factor loadings ranging from 0.800 to 0.645. This dimension explains 13.700% of the variance.

The Pearson Correlation Coefficients of the factors are presented in Table 3.

Table 3. Pearson correlation coefficients of factors

	Control	Doubt	Anxiety	Fear	Total
Control	1	0.688**	0.680**	0.672**	0.964**
Doubt	0.688 **	1	0.603**	0.636**	0.808**
Anxiety	0.680**	0.603**	1	0.644**	0.818**

Fear	0.672	0.636**	0.644**	1	0.834**
Total	0.964**	0.808**	0.818**	0.834**	1

** $p < 0.01$

In Table 3, the relationship between the factors of the scale and the total score was examined, and Pearson Correlation Coefficients (r) were calculated as additional evidence of construct validity. According to Büyüköztürk (2017, p. 32), the absolute value of the correlation coefficient can be categorized as follows: high (0.70–1.00), moderate (0.30–0.69), and low (0.00–0.29). In the Intolerance of Uncertainty Inventory, it was found that each factor, Control (r = 0.96), Doubt (r = 0.81), Anxiety (r = 0.82), and Fear (r = 0.83), had a high positive correlation with the overall scale.

Findings of the Confirmatory Factor Analysis

CFA was conducted to test whether the factor structure and item number were consistent when the scale, which consists of 17 items and a 4-factor structure, was applied to another study group. Data from 342 students were entered into SPSS software and re-encoded. These data were then transferred to the LISREL package program, where compliance indices were calculated.

Table 4. Goodness-of-Fit ındices based on first-level CFA results for the intolerance of uncertainty inventory

Chi-square/df	RMSEA	CFI	NNFI	NFI	GFI	AGFI	SRMR
2.3	0.073	0.98	0.98	0.97	0.89	0.87	0.054

In the analysis, the fit indices were examined, and the error variances of Items 1 and 2 and Items 3 and 8 within the same factor were correlated. First-level CFA was conducted to test the suitability of the proposed structure. The observed fit indices were: Chi-square/df = 2.23; RMSEA = 0.073; CFI = 0.98; NNFI = 0.98; NFI = 0.97; GFI = 0.89; AGFI = 0.87; and SRMR = 0.054.

Table 5. Goodness-of-Fit ındices based on second-level CFA results for the intolerance of uncertainty inventory

Chi-square/df	RMSEA	CFI	NNFI	NFI	GFI	AGFI	SRMR
2.21	0.073	0.98	0.98	0.97	0.89	0.87	0.055

In the second-level CFA, the suitability of the model's structure was assessed with the following observed fit indices: Chi-square/df = 2.21; RMSA = 0.073; CFI = 0.98; NNFI = 0.98; NFI = 0.97; GFI = 0.89; AGFI = 0.87; and SRMR = 0.055. According to Meydan and Şeşen (2011, p. 32), a ratio of the chi-square to degrees of freedom (χ^2/df) of less than 3 indicates an acceptable general model fit, even if the chi-square value is statistically significant. Browne and Cudeck (1992, p. 239) suggested that an RMSEA value of 0.05 or less reflects a close model fit, while a value of 0.08 or less represents a reasonable fit. Kline (2011, p. 208) noted that a CFI value of 0.95 or higher and an SRMR value of 0.08 or lower indicate a good fit.

When examining the GFI (Goodness-of-Fit Index), Cole (1987, p. 586) suggested that a value of 0.8 or above generally indicates a good fit, while Anderson and Gerbing (1984, p. 166)

considered a GFI value above 0.85 to be acceptable. The t-values associated with items in the factors ranged from 11.67 to 17.24, indicating that the items significantly contribute to the model. ($p < 0.05$).

3.1.3 Reliability Findings

In the reliability tests, Cronbach's Alpha internal consistency coefficient was calculated for the entire scale, resulting in a value of 0.933 for the Intolerance of Uncertainty Inventory.

Table 6. Reliability calculations of factors

	Cronbach Alpha Internal Consistency Coefficient
Factor 1: Control	$\alpha = 0.925$
Factor 2: Doubt	$\alpha = 0.817$
Factor 3: Anxiety	$\alpha = 0.806$
Factor 4: Fear	$\alpha = 0.808$

The internal consistency coefficients of the Intolerance of Uncertainty Inventory are as follows: Control 0.925 Doubt 0.817, Anxiety 0.806, and Fear 0.808. These coefficients indicate a high level of internal consistency across the different dimensions of the scale. As a result, it can be concluded that the items comprising the scale are consistent with each other and effectively measure the intended attitudes.

DISCUSSION AND CONCLUSION

The COVID-19 pandemic has triggered significant changes across various sectors globally, including economics, society, and education. These changes have introduced new uncertainties, highlighting the need for updated tools to measure individuals' intolerance of uncertainty in this evolving landscape. Existing scales in the literature that measure intolerance of uncertainty were developed before the pandemic and may not fully capture the current context. Therefore, a new scale that accurately reflects the current levels of intolerance of uncertainty a reliable and valid measurement tool to assess individuals' intolerance of uncertainty. Intolerance of uncertainty is closely associated with fear and anxiety regarding potential negative or harmful outcomes and represents individuals' tendency to react negatively to uncertain situations or events (Buhr & Dugas, 2006). According to Budner (1962), behaviors such as stress, denial, anxiety, and avoidance, especially in situations characterized by novelty, complexity, or insolubility, indicate high levels of intolerance to uncertainty.

A review of the literature revealed existing scales measuring intolerance to uncertainty, including two "Adaptation to Turkish" studies (Ersanlı & Uysal, 2015; Sarı & Dağ, 2009; Sarıçam et al., 2014) and the Attitude Against Uncertainty Scale developed by Ersanlı and Uysal (2015), a one-dimensional 15-item scale. The scale developed in this study differs from Ersanlı and Uysal's scale, featuring four sub-dimensions and 17 items, with questions addressing the behavioral, cognitive, and affective aspects of intolerance of uncertainty.

The Intolerance of Uncertainty Inventory's items were administered to a sample of students, and the responses were analyzed using EFA with SPSS software. EFA, a common technique in social sciences, explores the underlying structure influencing responses (Costello & Osborn, 2005; DeCoster, 1998). In a study with 574 university students, the KMO measure was 0.969, and Bartlett's test was significant (χ^2 = 12989.806, df = 820, p = 0.000). The analysis suggested a four-factor structure, which was confirmed by examining the scree plot and variance ratios. The final scale is a 17-item, 5-point Likert-type scale, with factors labeled "Control," "Doubt," "Anxiety," and "Fear," explaining 72.663% of the total variance.

Subsequent CFA with a different sample confirmed the four-factor structures, indicating good model fit: χ^2 = 497.88, df = 225, χ^2/df = 2.21, RMSEA = 0.060, CFI = 0,98, NNFI = 0.98, NFI = 0.97, GFI = 0.89, AGFI = 0.87, and SRMR = 0.055. Reliability analysis, conducted by calculating Cronbach's Alpha, revealed an internal consistency coefficient of 0.933 for the entire scale. The sub-dimensions showed high reliability: "Control" (α = 0.925), "Doubt" (α = 0.817), "Anxiety" (α = 0.806), and "Fear" (α = 0.808).

In conclusion, the Intolerance of Uncertainty Inventory is a valid and reliable tool for measuring adults' levels of intolerance to uncertainty. The 17-item scale uses a 5-point Likert scale with response options ranging from "Not suitable for me at all" to "Completely suitable for me," yielding a total score between 17 and 85. The t-values for the factors ranged from 11.67 to 17.24, indicating significant contributions of the items to the model ($p < 0.05$). However, a limitation of this study is that data were collected from only students at a public university. Future studies should include a more diverse sample from different regions to generalize the findings.

CONFLICT OF INTEREST

There are no conflicts of interest related to this study. The responsibility for the content and writing of this paper lies solely with the authors.

REFERENCES

Anderson, E.C., Carleton, R.N., Diefenbach, M., & Han, P.K.J. (2019). The relationship between uncertainty and affect. *Frontiers in Psychology*, *10*, 2504.

Anderson, J.C., & Gerbing, D.W. (1984). The effect of sampling error on convergence, improper solutions, and goodness-of-fit indices for maximum likelihood confirmatory factor analysis. *Psychometrika*, *49*(2), 155-173.

Bredemeier, K., & Berenbaum, H. (2008). Intolerance of uncertainty and perceived threat. *Behaviour Research and Therapy*, *46*(1), 28-38.

Browne, M.W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological Methods and Research*, *21*(2), 230-258.

Budner, S. (1962). Intolerance of ambiguity as a personality variable. *Journal of Personality*, *30*, 29-50.

Buhr, K., & Dugas, M.J. (2006). Investigating the construct validity of intolerance of uncertainty and its unique relationship with worry. *Journal of Anxiety Disorders*, *20*(2), 222-236.

Büyüköztürk, Ş. (2012). *Veri analizi el kitabı*. Ankara: Pegem A Yayıncılık.

Carleton, R.N., Norton, M.A.P.J., & Asmundson, G.J.G. (2007). Fearing the unknown: A short version of the intolerance of uncertainty scale. *Journal of Anxiety Disorders*, *21*(1), 105-117.

Cole, D.A. (1987). Utility of confirmatory factor analysis in test validation research. *Journal of Consulting and Clinical Psychology*, *55*(4), 584-594.

Costello, A.B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation*, *10*, 1-9.

Davey, G.C.L. (1994). Worrying, social problem-solving abilities, and social problem-solving confidence. *Behaviour Research and Therapy*, *32*(3), 327-330.

Dugas, M.J., Freeston, M.H., & Ladouceur, R. (1997). Intolerance of uncertainty and problem orientation in worry. *Cognitive Thearpy and Research*, *21*, 693-606.

Dugas, M.J., Gosselin, P., & Ladouceur, R. (2001). Intolerance of uncertainty and worry: Investigating narrow specificity in a nonclinical sample. *Cognitive Therapy and Research*, *25*(5), 551-558.

Dugas, M.J., Schwartz, A., & Francis, K. (2004). Intolerance of uncertainty, worry and depression. *Cognitive Therapy and Research*, *28*(6), 835-842.

Ersanlı, K., & Uysal, E. (2015). Belirsizliğe karşı tutum ölçeğinin geliştirlmesi. *Elektronik Sosyal Bilimler Dergisi*, *14*(54), 46-53.

Field, A. (2009). *Discovering statistics using SPSS* (3rd edition). London: SAGE Ltd.

Freeston, M.H., Rhéaume, J., Letarte, H., Dugas, M.J., & Ladouceur, R. (1994). Why do people worry? *Personality and Individual Differences*, *17*(6), 791-802.

Frenkel-brunswik, E. (1949). Intolerance of ambiguity as an emotional and perceptual personality variable. *Journal of Personality*, *18*(1), 108-143.

Grenier, S., Barrette, A.M., & Ladouceur, R. (2005). Intolerance of uncertainty and intolerance of ambiguity: Similarities and differences. *Personality and Individual Differences*, *39*(3), 593-600.

Grupe, D.W., & Nitschke, J.B. (2013). Uncertainty and anticipation in anxiety: An integrated neurobiological and psychological perspective. *Nature Reviews. Neuroscience*, *14*(7), 488-501.

Han, P.K.J., Gutheil, C., Hutchinson, R.N., & LaChance, J.A. (2020). Cause or effect? The role of prognostic uncertainty in the fear of cancer recurrence. *Frontiers in Psychology*, *11*, 626038.

Hirsh, J.B., Mar, R.A., & Peterson, J.B. (2012). Psychological entropy: A framework for understanding uncertainty-related anxiety. *Psychological Review*, *119*(2), 304-320.

Jöroskog, K.G., & Sörbom, D. (1993). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Mooresville, IL: Scientific Software International.

Kalaycı, Ş. (2018). *SPSS uygulamalı çok değişkenli istatistik teknikleri*. Ankara: Asil Yayın Dağıtım.

Kline, R.B. (2011). *Principals and practice of structural equation modeling*. New York: The Guilford Press.

Leech, N.L., Barrett, K.C., & Morgan, G.A. (2005). *SPSS for ıntermediate statistics, use and ınterpretation* (2nd edition). Mahwah: Lawrence Erlbaum Associates Inc.

Meydan, C.H., & Şeşen, H. (2011). *Yapısal eşitlik modellemesi AMOS uygulamaları*. Ankara: Detay Yayıncılık.

Pallant, J. (2007). *SPSS survival manual: A step by step guide to data analysis using SPSS for Windows* (3rd edition). New York: McGraw-Hill Education.

Rosen, N.O., & Knäuper, B. (2009). A little uncertainty goes a long way: State and trait differences in uncertainty ınteract to ıncrease ınformation seeking but also ıncrease worry. *Health Communication*, *24*(3), 228-238.

Sarı, S., & Dağ, İ. (2009). Belirsizliğe tahammülsüzlük ölçeği, endişe ile ilgili olumlu inançlar ölçeği ve endişenin sonuçları ölçeği'nin Türkçeye uyarlanması, geçerliliği ve güvenilirliği. *Anadolu Psikiyatri Dergisi*, *10*, 261-270.

Sarıçam, H., Erguvan, F.M., Akın, A., & Akça, M.Ş. (2014). Belirsizliğe tahammülsüzlük ölçeği (BTÖ-12) Türkçe formu: Geçerlik ve Güvenirlik çalışması. *Route Educational and Social Science Journal*, *1*(3), 148-257.

Suhr, D. (2006). *Exploratory or confirmatory factor analysis?* Proceedings of the 31st annual SAS? Users Group International Conference. Cary, NC: SAS Institute Inc., Paper Number: 200-31.

Tabachnick, B.G., & Fidell, L.S. (2013). *Using multivariate statistics* (6th edition). Boston, MA: Pearson.

Tavşancıl, E. (2010). *Tutumların ölçülmesi ve SPSS ile veri analizi* (4. Basım). Ankara: Nobel Yayın Dağıtım.

Tory Higgins, E.T. (2000). Social cognition: Learning about what matters in the social world. *European Journal of Social Psychology*, *30*(1), 3-39.

Türk Dil Kurumu-Belirsizlik (2024). https://sozluk.gov.tr/.