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Adaptation, Validity, and Reliability of the Turkish Version of Contrast Avoidance Questionnaires

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ABSTRACT

This study aimed to adapt the Contrast Avoidance Model (CAM) and its measurement tools into Turkish while evaluating their psychometric properties. Llera and Newman (2017) developed the CAM to explore how avoiding sudden emotional changes can lead to pathological worry. The study utilized the Contrast Avoidance Questionnaires (CAQs), which comprises two scales: the Contrast Avoidance Questionnaire-Worry (CAQ-W) and Contrast Avoidance Questionnaire-General Emotions (CAQ-GE). A total of 549 participants, aged 18–66 (M=27.21), completed the CAQ-W, CAQ-GE, Depression Anxiety Stress Scale, Why Worry-II Scale, Penn State Worry Questionnaire, State-Trait Anxiety Inventory-II, Acceptance and Action Questionnaire-II, and Symptom Checklist-90. Confirmatory factor analysis confirmed the original three-factor structure of the CAQ-W and the two-factor structure of the CAQ-GE (CAQ-W: χ^2/df=2.97; Goodness of Fit Index [GFI]=0.87; Comparative Fit Index [CFI]=0.91; Root Mean Square Error of Approximation [RMSEA]=0.06; CAQ-GE: χ^2/df=2.73; GFI=0.90; CFI=0.95; RMSEA=0.05). The internal consistency was high (α=0.92 for CAQ-W; α=0.95 for CAQ-GE),with test–retest correlations of 0.77 and 0.82, respectively. Although women scored higher on contrast avoidance than men, this difference was not statistically significant. Overall, the findings suggest that the Turkish versions of the CAQs are valid and reliable tools for assessing contrast avoidance mechanisms in the Turkish population.

Keywords: Anxiety, depression, validation studies as topic.

ÖZ

Kontrasttan Kaçınma Anketlerinin Türkçe Formunun Uyarlanması, Geçerliliği ve Güvenilirliği

Bu çalışma, Kontrasttan Kaçınma Modeli ve bu modelin ölçme araçlarının Türkçeye uyarlanmasını ve psikometrik özelliklerinin değerlendirilmesini amaçlamaktadır. Llera ve Newman (2017) tarafından geliştirilen Kontrasttan Kaçınma Modeli, ani duygusal değişimlerden kaçınmanın patolojik endişeye yol açabileceğini öne sürmektedir. Bu modelin ölçme araçları olan Kontrasttan Kaçınma Ölçekleri (KKÖ), Kontrasttan Kaçınma Ölçeği-Endişe (KKÖ-E) ve Kontrasttan Kaçınma Ölçeği-Genel Duygular (KKÖ-GD) olmak üzere iki ölçekten oluşmaktadır. Araştırmaya, 18–66 yaş aralığında ve yaş ortalaması 27,21 yıl olan 549 katılımcı dahil edildi. Katılımcılar, KKÖ-E, KKÖ-GD, Depresyon Anksiyete Stres Ölçeği (DASÖ-21), Endişe ile İlgili Olumlu İnançlar Ölçeği (EOİÖ), Penn State Endişe Ölçeği (PSEÖ), Sürekli Kaygı Ölçeği (STAI-II), Kabul ve Eylem Formu-II (KEF-II) ve Belirti Tarama Testi (SCL-90) ölçeklerini doldurdu. Doğrulayıcı faktör analizi (DFA), KKÖ-E'nin üç faktörlü ve KKÖ-GD'nin iki faktörlü yapısını Türk örnekleminde doğruladı (KKÖ-E: χ^2/df=2,97, GFI=0,87, CFI=0,91, RMSEA=0,06; KKÖ-GD: χ^2/df=2,73, GFI=0,90, CFI=0,95, RMSEA=0,05). Ölçeklerin iç tutarlılık değerleri Cronbach alfa katsayısı ile 0,92 (KKÖ-E) ve 0,95 (KKÖ-GD) olarak bulundu. Test-tekrar test güvenilirliği KKÖ-E için 0,77, KKÖ-GD için 0,82 olarak hesaplandı. Kadınların kontrasttan kaçınma puanları erkeklerden daha yüksek olmasına rağmen, bu fark istatistiksel olarak anlamlı bulunmadı. Sonuç olarak, kontrasttan kaçınma ölçeklerinin Türkçe versiyonlarının geçerli ve güvenilir ölçüm araçları olduğu öne sürülebilir.

Anahtar Kelimeler: Anksiyete, depresyon, doğrulama çalışmaları.

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INTRODUCTION

Worry is recognized as a transdiagnostic risk factor that negatively impacts psychological and physical health (Marshall et al, 2018; Brosschot et al, 2006; Tully et al, 2013). Excessive worry has been associated with diminished quality of life, impaired job performance, and inappropriate behavior, as well as an increased risk of social harm (Javaherirenani et al, 2025). Worry is not only a core process of generalized anxiety disorder (GAD) but also a transdiagnostic process for a wide spectrum of clinical problems. Despite its negative effects on mental and physical health, worry has not yet received sufficient research attention (Dugas et al, 2010).

Previously, worry was often conflated with the cognitive aspects of anxiety. However, it has since been recognized as a distinct concept, separate from the cognitive elements of anxiety, allowing researchers to study it independently (Davey, 1993; Davey et al, 1992; Zebb & Beck, 1998). Borkovec, Robinson, Pruzinsky, and DePree (1983, p. 10) describe worry as a series of negatively charged thoughts and mental images characterized by a perceived lack of control. It involves attempts to mentally resolve problems related to uncertain situations that could result in negative outcomes and is closely associated with the fear process. More recent interpretations expand on this definition, conceptualizing worry as an anxious anticipation of potential future negative events (Barlow, 2004).

With the inclusion of worry as a core feature of GAD in the revised third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; American Psychiatric Association, 1987), research on worry formation has increased, providing valuable insights into the frequency, nature, and function of worry and GAD. One of the first experimental studies on worry, conducted by Borkovec and Hu (1990), resulted in the emergence of the Cognitive Avoidance Theory of Worry, which is rooted in Mowrer's Fear Theory (1947) and Foa and Kozak's (1986) Emotional Processing Model (Behar et al, 2009). As per this theory, while worry may serve as an inadequate cognitive strategy to solve problems and eliminate perceived threats, it can also function as a means of avoiding the uncomfortable somatic and emotional experiences that naturally arise during fear (Borkovec et al, 2004). However, conflicting findings have emerged regarding the hypothesis that worry facilitates the avoidance of unpleasant somatic and emotional experiences. Several studies (Ottaviani et al, 2014; Skodzik et al, 2016; Pieper et al, 2010; Ottaviani et al, 2016) have indicated that worry produces various physiological effects, including reduced vagal tone, consistently elevated heart rate, heightened skin conductivity, increased endocrine system activity, higher blood pressure, and decreased heart rate variability. These findings suggest that worry can increase somatic activation.

Recent research challenges the notion that worry prevents negative emotional states. Instead, it has been argued that worry either triggers or prolongs negative emotions; several studies support this perspective (Pieper et al, 2010; Key et al, 2008; Verkuil et al, 2009; Llera & Newman, 2017; Burkhouse et al, 2015). Mennin, Heimberg, Turk, and Fresco (2005) found that individuals diagnosed with GAD are more likely to report that worry initiates and sustains negative emotions. Moreover, trait worry has been linked to a persistent, heightened sensitivity to threatening cues at the neural level.

Owing to these contradictory findings, Llera and Newman (2010) conducted an experimental study, expanding upon Borkovec's research while introducing key modifications. They examined the effects of anxiety, relaxation, and neutral inductions on reactivity to different emotional stimuli (fear, sadness, calmness, and happiness) in individuals with GAD and healthy participants. Participants who underwent anxiety induction exhibited lower physiological and subjective responses to the fear clip than those who underwent relaxation induction. Individuals with GAD did not show vagal withdrawal after neutral induction, whereas healthy individuals did. However, participants in the anxiety induction condition showed greater subjective reactivity to the fear clip than those in the neutral induction condition. These findings suggest that worry intensifies negative mood and that preemptive responses to fear exposure may help mitigate physiological arousal. However, no evidence was found to support fear-related emotion avoidance.

Regarding the sadness clip, participants who underwent anxiety induction reported fewer subjective responses than those in the neutral and relaxation induction conditions. Interestingly, the sadness clip resulted in a reduction in negative emotionality among those in the anxiety induction condition. Although anxiety did not directly affect physiological responses to negative emotions, it appeared to attenuate subjective reactivity. In contrast, no significant physiological or subjective differences were observed across the anxiety, relaxation, and neutral induction conditions in response to positive emotions. The happy clip elicited positive subjective responses regardless of the preceding induction type. Furthermore, anxiety did not inhibit the positive effects associated with positive emotions and increased vagal activity in response to the happy clip.

As a result, Newman and Llera (2011) developed the Contrast Avoidance Model (CAM) for GAD (Newman et al, 2013). The CAM is based on three core tenets: First, individuals with GAD are threatened by sharp shifts in negative emotion; they are highly sensitive to sharp negative emotional shifts and struggle to regulate them. They exhibit heightened

emotional reactivity, making it difficult to cope with emotional contrasts. Second, individuals with GAD use worry to create and sustain negative emotions to avoid negative emotional contrast; they engage in worry as a means of generating and maintaining a negative emotional state, thereby preventing sudden emotional shifts. Contrary to previous theories, the CAM does not propose that worry functions to suppress or avoid negative emotions; rather, it argues that worry itself triggers arousal and has detrimental psychological and physiological consequences (Newman & Llera, 2011). Third, individuals with GAD experience discomfort in resting positive states but do not avoid brief positive experiences (Positive Emotional Contrasts). The model suggests that while these individuals may seek short-term positive emotions, they simultaneously fear the possibility of a subsequent negative shift. Consequently, persistent worry serves as a mechanism to prepare for potential negative outcomes. However, after experiencing short-term positive emotions, these individuals often return to familiar negative emotional states, reinforcing the cycle of worry (Newman & Llera, 2017).

Newman and Llera (2017) developed two self-report measures to assess contrast avoidance tendencies: the Contrast Avoidance Questionnaire-Worry (CAQ-W), which evaluates the role of worry in contrast avoidance, and the Contrast Avoidance Questionnaire-General Emotion (CAQ-GE), which examines the role of other negative emotions. These two questionnaires, which assess contrast avoidance tendencies, complement each other and measure the model's different aspects. This study aimed to adapt these questionnaires into Turkish and evaluate their reliability and validity.

METHODS

Adaptation Process, Procedure, and Data Collection

First, permission for the study was obtained via email from Sandra J. Llera, the original scale developer. Ethical approval was obtained from the Istanbul Medipol University Social and Human Sciences Research Ethics Committee (Decision No: 41 Dated: April 29, 2019). This study was conducted in accordance with the Declaration of Helsinki to ensure the ethical standards and the rights of the participants. Three independent professionals—two psychiatrists and one psychologist—who specialize in repetitive thinking and have expertise in mental health conducted the Turkish translation of the scales. The most accurate translations for each item were selected from the three options following the translation process, resulting in the final version. Two individuals from the Department of English Language performed a back-translation of this final version, with no revisions suggested by the language experts.

The finalized Turkish version of the questionnaire was subsequently piloted with 80 participants to assess their comprehension of the items. Minor revisions were made based on the feedback received, leading to the establishment of the final version. Data were collected over approximately 4 months (May 2019–September 2019) through an online Google Form. The survey link was shared via social media platforms and WhatsApp groups, allowing voluntary participation. To evaluate the test–retest reliability of the scales, 20 participants from the research group were asked to complete the scales again after 1 month.

Participants

The sample consisted of 549 Turkish participants (394 women and 155 men) aged 18–66 years. The participants' mean age was 27.21 years (SD=9.89). The participants were nearly evenly split in terms of romantic relationships, with 49.4% reporting being in a relationship and 50.6% reporting not being in a relationship.

Instruments

CAQ-W

The CAQ-W, developed by Llera and Newman (2017), is a self-report scale that assesses the role of worry in negative contrast avoidance. The five-point Likert-type scale consists of 30 items and three subdimensions: 1) worry to avoid negative emotional shifts, 2) worry to create and sustain negative emotion, and 3) worry to create positive contrast. High scores on the scale indicate a tendency to use worry for contrast avoidance.

CAQ-GE

The CAQ-GE is a 25-item measure that assesses emotional contrast avoidance tendencies (Llera & Newman, 2017). It encompasses two subdimensions: "creating/sustaining negative emotion to avoid negative contrasts" and "discomfort with emotional shifts." Items were rated using a five-point Likert-type scale ranging from 1 (not at all true) to 5 (absolutely true). High scores indicated a tendency to maintain negative emotions as a strategy to avoid sudden emotional shifts.

Depression Anxiety Stress Scale (DASS-21)

The initial version of the scale was developed by Lovibond and Lovibond in 1995 and comprised 42 questions. Later, a 21-question version of the scale was developed (Antony et al, 1998). Participants were asked to state their answers on a four-point Likert scale. The Turkish adaptation was developed (Yıldırım et al, 2018) with three subscales: depression, anxiety, and stress; these subscales had internal consistency (coefficients alpha) of 0.89, 0.87, and 0.90, respectively.

Why Worry-II Scale (WW-II)

This scale was originally developed in French to assess positive beliefs regarding worry (Freeston et al, 1994). It was later adapted into English and revised (Holowka et al, 2000). The scale comprises 25 items that express positive beliefs about worry. Participants were asked to rate these items on a five-point Likert scale. The scale was adapted to Turkish by Sarı and Dağ (2009). While the original version had a five-factor structure, the Turkish adaptation exhibited a three-factor structure: 1) "worrying helps problem solving and is a source of motivation," 2) "worrying prevents dangerous and negative consequences," and 3) "worrying protects against negative emotions." The Turkish version of the scale has high internal consistency (a=0.95).

Penn State Worry Questionnaire (PSWQ)

The questionnaire developed by Meyer, Miller, Metzger, and Borkovec (1990) measures pathological worry characterized by excessive, persistent, and uncontrollable features. This self-report instrument consists of 16 items rated on a 5-point Likert scale. Boysan and Keskin (2008) conducted the validity and reliability study for the Turkish adaptation. For the Turkish version, the internal consistency coefficient was found to be 0.88, whereas the test–retest reliability coefficient ranged from 0.74 to 0.92 in the assessments conducted at intervals of 2–10 weeks.

State-Trait Anxiety Inventory-II (STAI)

The STAI was developed (Spielberger et al, 1970) to measure state and trait anxiety levels. The STAI consists of two distinct scales, each with 20 items: STAI-I, which is designed to assess state anxiety, and STAI-II, which is intended for trait anxiety measurement. The Turkish version underwent validity and reliability evaluations, which were conducted by Öner and Le Compte (1985). Only the STAI-II version was used in our study.

Acceptance and Action Questionnaire-II (AAQ-II)

The AAQ-II is an improved version of the initial Acceptance and Action Questionnaire, with stronger statistical data. This method was developed (Bond et al, 2011) to measure differences in psychological inflexibility and experiential avoidance in individuals. It is a unidimensional, seven-point Likert scale. An increase in the total scale score indicates heightened psychological inflexibility and experiential avoidance. The internal consistency coefficient of the scale for the total score was 0.84. The Turkish validity and reliability study of AAQ-II was conducted by Yavuz et al. (2016).

Symptom Checklist (SCL-90-R)

The scale, developed by Derogatis (1977), is a self-report instrument. It encompasses nine subdimensions that aim to capture psychiatric symptoms and complaints. These include somatization (S), anxiety (A), obsessive-compulsive symptoms, depression (D), interpersonal sensitivity, psychoticism (P), paranoid thought, anger-hostility, and phobic anxiety. Additionally, an extra subdimension covers symptoms related to guilt, eating disorders, sleep disturbances, and similar issues. The assessment consists of 10 subdimensions. The scale comprises 90 items, and the corresponding internal consistency coefficients for these subdimensions are as follows: 0.82, 0.84, 0.73, 0.78, 0.79, 0.73, 0.63, 0.79, 0.78, and 0.77. Scoring involves assigning points from 0 to 4 for each item. The validity and reliability analyses for the Turkish version were conducted by Dağ in 1991.

Data Analysis

The Turkish versions of CAQ-W and CAQ-GE were analyzed for validity and reliability using SPSS 20 and AMOS v24.

The skewness and kurtosis values of the distribution were examined to assess normality. The skewness values for all indicators fell within the range of ±2.0, and the kurtosis values were within ±7.0, indicating that the data followed a normal distribution (West et al, 1995).

Bartlett's test of sphericity and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy were employed to determine whether the Turkish forms of CAQ-W and CAQ-GE were suitable for factor analysis. The KMO statistic ranges from 0 to 1, with values above 0.6 considered acceptable. Additionally, in Bartlett's test of sphericity, a p-value below 0.05 is considered satisfactory (Tabachnick & Fidell, 2001).

Subsequently, Confirmatory factor analysis (CFA) was conducted using AMOS v24 to evaluate the factor validity of the scales. This analysis assessed whether the data from the Turkish scales aligned with the factor structures proposed in their original versions.

The accuracy and fit of the models in structural equation modeling (SEM) were assessed using various fit indices. One commonly used index, the Chi-square to degrees of freedom ratio (χ^2/df), is preferred over the Chi-square statistic alone, as the latter is highly sensitive to sample size (Şimşek, 2007). Several fit indices, including χ^2/df, RMSEA, CFI, and SRMR, were employed in this study. Higher values indicate better model fit for certain indices (e.g., GFI, CFI, and Incremental Fit Index [IFI]), whereas lower values are preferable for others (e.g., RMSEA) (Munro, 2005; Şimşek, 2007).

Table 1. Descriptive Statistics

Scales	Mean	SD	Min	Max
CAQ-W	86.76	19.93	30.00	150.00
CAQ-GE	61.00	20.28	25.00	125.00
AAQ-II	24.48	10.22	7.00	49.00
DASS-21	23.07	14.85	0.00	60.00
WW-II	59.97	23.54	25.00	125.00
PSWQ	45.94	12.39	18.00	76.00
SCL-90-R	104.71	72.63	0.00	338.00
STAI-II	50.45	12.35	24.00	90.00

CAQ-W: Contrast Avoidance Questionnaire-Worry; CAQ-GE: Contrast Avoidance Questionnaire-General Emotion; AAQ-II: Acceptance and Action Questionnaire-II; DASS-21: Depression, Anxiety, and Stress Scale-21; WW-II: Why Worry-II; PSWQ: Penn State Worry Questionnaire; SCL-90-R: Symptom Checklist-90-Revised; STAI-II: State-Trait Anxiety Inventory-Trait Form; SD: Standard deviation; Min: Minimum; Max: Maximum.

Specific reference values are used in the structural equation modeling to assess the model fit. The IFI indicates an acceptable fit at ≥0.90 and an excellent fit at ≥0.95. Similarly, the CFI suggests an acceptable fit at ≥0.95 and an excellent fit at ≥0.97. The GFI denotes an acceptable fit at ≥0.85, while values ≥0.90 indicate an excellent fit. The RMSEA supports an acceptable fit at ≤0.080 and an excellent fit at ≤0.050. Lastly, χ^2/df is generally considered acceptable at ≤3.0 (Marcoulides & Schumacker, 2001). Collectively, these indices provide a comprehensive assessment of model fit, ensuring the suitability of the models for SEM analyses.

The DASS-21, STAI-II, PSWQ, SCL-90-R, WW-II, and AAQ-II were used for the validity analyses of the scales, and their relationships were examined using Pearson correlation analysis. To assess the reliability of the scales, the Cronbach's alpha coefficient and test–retest reliability were analyzed.

RESULTS

Descriptive Statistics

Table 1 presents the averages, standard deviations, and minimum and maximum values of the scales' scores used in the study.

Construct Validity Analyses

The analysis of the KMO and Bartlett's sphericity tests, evaluating the CAQ-W and CAQ-GE forms for factor analysis, indicates the data's suitability. For the CAQ-E scale, the KMO was 0.948, indicating high sampling adequacy. Bartlett's test (χ^2=9933.401, df=435, p<0.001) affirmed the non-identity correlation, supporting the factor analysis. Similarly, the KMO of CAQ-GE was 0.959, indicating strong sampling adequacy. Bartlett's test (χ^2=9645.298, df=300, p<0.001) reinforced data suitability.

Table 2. Fit indices for the models for the Turkish form of the CAQ-W tested in the confirmatory factor analysis

	χ^2/df	GFI	CFI	IFI	RMSEA	p
Model 1	3.88	0.83	0.88	0.88	0.07	0.001**
Model 2	2.97	0.87	0.91	0.91	0.06	0.001**

CAQ-W: Contrast Avoidance Questionnaire-Worry; χ^2/df: Chi-square to degrees of freedom ratio; GFI: Goodness of Fit Index; CFI: Comparative Fit Index; IFI: Incremental Fit Index; RMSEA: Root mean square error of approximation; *: P<0.05; **: P<0.001.

Table 3. Fit indices for the models for the Turkish form of the CAQ-GE tested in the confirmatory factor analysis

	χ^2/df	GFI	CFI	IFI	RMSEA	p
Model 1	4.48	0.84	0.90	0.90	0.08	0.001
Model 2	2.73	0.90	0.95	0.95	0.05	0.001

CAQ-GE: Contrast Avoidance Questionnaire-General Emotion; χ^2/df: Chi-square to degrees of freedom ratio; GFI: Goodness of Fit Index; CFI: Comparative Fit Index; IFI: Incremental Fit Index; RMSEA: Root mean square error of approximation; *: P<0.05; **: P<0.001.

CFA

CAQ-W

The CFA of the CAQ-W Turkish version was conducted using AMOS v24. Based on the values of various fit indices, the initial model did not meet the criteria for an acceptable fit. Upon further investigation of the modification indices, enhancements could be made to the model. Specifically, an analysis of the modification indices for items 1–2, 6–14, 19–20, 24–27, and 28–29 showed significant covariance-related measurement errors among these pairs of items. Consequently, these errors were rectified by making appropriate adjustments to the model.

The final fit indices for the revised 30-item model exhibited notable improvements over the original model after implementing these modifications. Table 2 shows the final model fit indices. These final indices indicate a markedly enhanced model fit compared with the initial version.

Figure 1 shows the factorial model of the scale and its standardized coefficients and t-values regarding the factor-item relationship. Looking at the figure, the factor loads of the items are 0.50 and above. In this case, the factor loads are at a good level (Büyüköztürk, 2002).

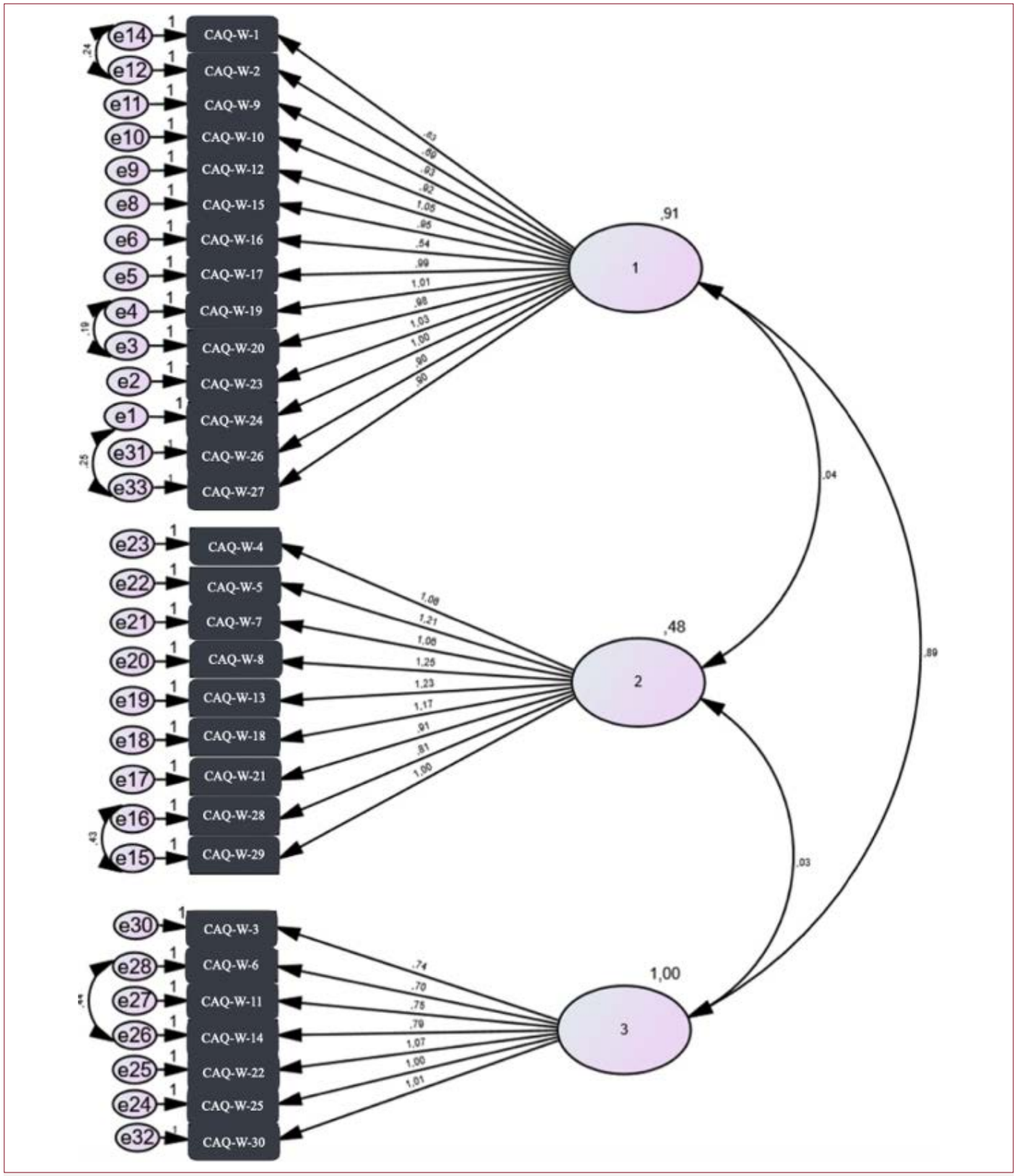

Figure 1. Standardized two-factor confirmatory factor analysis model for the Turkish version of the CAQ-W.

Table 4. Convergent validity of CAQ measures and subscales

	1	2	3	4	5	6	7	8	9	10	11
CAQ measures											
1. CAQ-W Total	1										
2. CAQ-W F1	0. 907**	1									
3. CAQ-W F2	0.407**	0.041	1								
4. CAQ-W F3	0.840**	0.803**	0.047	1							
5. CAQ-GE total	0.718**	0.728**	0.169**	0.608**	1						
6. CAQ-GE F1	0.698**	0.759**	0.041	0.635**	0.962**	1					
7. CAQ-GE F2	0.884**	0.898**	0.036	0.916**	0.631**	0.656**	1				
Convergent measures											
8. AAQ-II	502**	0.444**	0.306**	0.332**	0.663**	0.575**	0.378**	1			
9. PSWQ	0.557**	0.490**	0.356**	0.374**	0.567**	0.502**	0.400**	0.613**	1		
10. WW-II	0.685**	0.727**	0.006	0.676**	0.651**	0.668**	0.709**	0.471**	0.451**	1	
11. STAI-II	0.431**	0.371**	0.274**	0.295**	0.499**	0.434**	0.306**	0.650**	0.646**	0.680**	1

CAQ-W Total: Contrast Avoidance Questionnaire-Worry; CAQ-W F1: Worry to Avoid Negative Emotional Shifts; CAQ-W F2: Worry Creates and Sustains Negative Emotion; CAQ-W F3: Worry to Create Positive Contrast; CAQ-GE Total: Contrast Avoidance Questionnaire-General Emotion; CAQ-GE F1: Creating and Sustaining Negative Emotion to Avoid Negative Contrasts; CAQ-GE F2: Discomfort with Emotional Shifts; AAQ-II: Acceptance and Action Questionnaire-II; WW-II: Why Worry-II; PSWQ: Penn State Worry Questionnaire; STAI-II: State-Trait Anxiety Inventory-Trait Form. *: P<0.05; **: P<0.001.

CAQ-GE

CFA was also applied to test the construct validity of CAQ-GE, which originally had a two-factor structure. Considering the values because of the analysis, the model did not provide acceptable values; however, the model could be improved upon examining the modification indices. Suitability indices 1.-2., 4.-5., 21.-22., and 19.-23. revealed high covariance-related measurement errors among the items, which were corrected. According to the final fit indices, the revised and adjusted 25-item model outperformed the previous model. The values of the fit indices of the models are shown in Table 3.

Figure 2 presents the scale's factorial structure with standardized coefficients and t-values. The factor loadings, all at or above 0.50, indicate a satisfactory level (Büyüköztürk, 2002).

Convergent Validity Analyses

To determine the convergent validity of the CAQ-W, CAQ-GE, and their factors, we examined the correlation coefficients between STAI-II, PSWQ, WW-II, and AAQ-II. There was a significant correlation between CAQ-W, CAQ-GE, their factors, and all the other scales (Table 4).

Predictive Validity Analyses

The results of the hierarchical regression analysis indicated that CAQ-GE contributed more than CAQ-W in predicting PSWQ, STAI-II, DASS-Depression, DASS-Anxiety, DASS-Stress, SCL-Depression, and SCL-Anxiety scores.

The regression analysis indicated that CAQ-W significantly predicted all psychological outcomes; however, CAQ-GE was generally a stronger predictor, explaining a greater percentage of the variance in most cases. For PSWQ-A, CAQ-GE (β=0.211, t=7.057, p<0.001) was the strongest predictor, increasing the explained variance to 5.8% (R^2=0.058). In predicting STAI-II, CAQ-GE (β=0.239, t=7.414, p<0.001) accounted for 7.4% of the variance (R^2=0.074), showing a stronger effect than CAQ-W. For DASS-D, CAQ-GE (β=0.106, t=8.772, p<0.001) was the most influential predictor, explaining 9.5% of the variance (R^2=0.095). Similarly, for DASS-A, CAQ-GE (β=0.079, t=5.530, p<0.001) accounted for 4.3% of the variance (R^2=0.043). In DASS-S, CAQ-GE (β=0.099, t=6.749, p<0.001) explained 6.2% of the variance (R^2=0.062). For SCL-D, CAQ-GE (β=0.277, t=8.281, p<0.001) had the strongest effect, accounting for 9.0% of the variance (R^2=0.090). Lastly, for SCL-A, CAQ-GE (β=0.174, t=7.583, p<0.001) was the most significant predictor, explaining 7.8% of the variance (R^2=0.078). Overall, CAQ-GE consistently showed a stronger influence on psychological distress than CAQ-W (Table 5).

Internal Consistency

Corrected item–total correlations for the Turkish version of the CAQ-W items, the Cronbach's alpha coefficients (α) were found to be 0.93 for the first factor, 0.89 for the second factor, 0.85 for the third factor, and 0.92 for the total score. For the Turkish version of CAQ-GE, the Cronbach's alpha coefficients were found to be 0.96 for the first factor, 0.86 for the second factor,

Table 5. Results of the hierarchical regression analyses using CAQ-W and CAQ-GE as predictors

Variable	PSWQ-A		STAI-II		DASS-D		DASS-A		DASS-S		SCL-D		SCL-A	
	β	t	β	t	β	t	β	t	β	t	β	t	β	t
CAQ-W	0.192	6.324*	0.093	2.829*	0.039	3.196*	0.060	4.101*	0.053	3.526*	0.089	2.617*	0.063	2.678*
CAQ-GE	0.211	7.057*	0.239	7.414*	0.106	8.772*	0.079	5.530*	0.099	6.749*	0.277	8.281*	0.174	7.583*
R^2	0.058		0.074		0.095		0.043		0.062		0.090		0.078	
p	0.000		0.000		0.000		0.000		0.000		0.000		0.000	

CAQ-W: Contrast Avoidance Questionnaire-Worry; CAQ-GE: Contrast Avoidance Questionnaire-General Emotion; PSWQ: Penn State Worry Questionnaire; DASS-D: Depression, Anxiety, and Stress Scale-Depression; DASS-A: Depression, Anxiety, and Stress Scale- Anxiety; DASS-S: Depression, Anxiety, and Stress Scale-Stress; SCL-D: Symptom Checklist-90-Depression; SCL-A: Symptom Checklist-90-Anxiety. *p<0.05, **p<0.001.

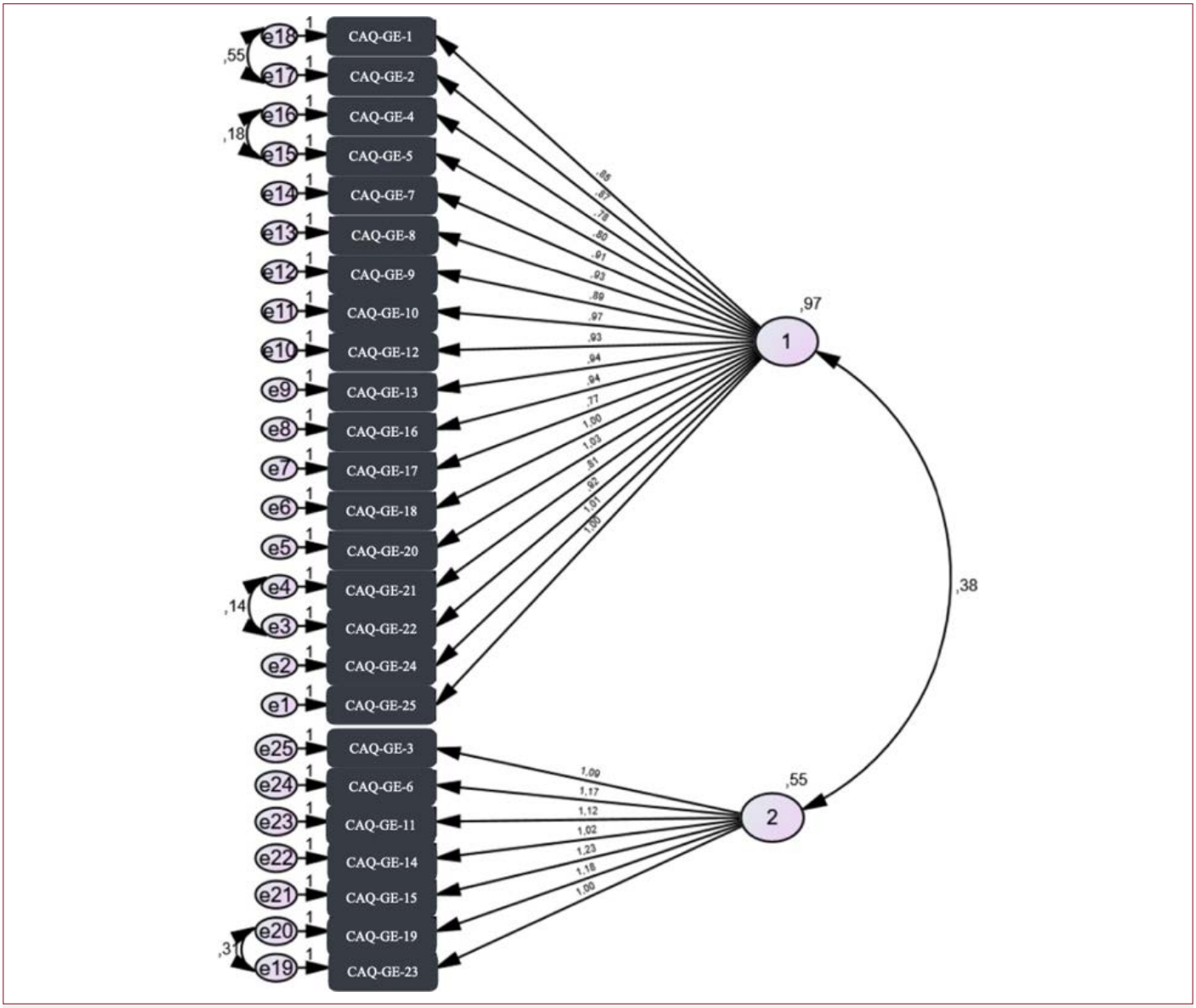

Figure 2. Standardized two-factor confirmatory factor analysis model for the Turkish version of the CAQ-GE .

Table 6. Corrected item–total statistics for the CAQ-W scale

	Mean if item is deleted	Variance if item is deleted	Corrected item–total correlation	Cronbach's alpha if item is deleted
1	84.79	376.245	0.493	0.921
2	84.66	375.244	0.459	0.922
3	84.48	370.860	0.507	0.921
4	82.89	378.334	0.397	0.923
5	82.86	385.737	0.252	0.924
6	83.45	370.105	0.539	0.921
7	82.63	384.900	0.323	0.923
8	82.92	386.881	0.221	0.925
9	84.17	365.209	0.660	0.919
10	84.50	365.878	0.674	0.919
11	84.62	370.853	0.561	0.920
12	84.11	362.290	0.675	0.919
13	82.90	382.949	0.331	0.923
14	83.62	368.046	0.579	0.920
15	84.46	366.588	0.661	0.919
16	83.92	373.156	0.459	0.922
17	84.44	363.010	0.724	0.918
18	82.94	385.495	0.265	0.924
19	84.13	363.704	0.686	0.919
20	84.24	364.709	0.661	0.919
21	83.43	384.472	0.254	0.925
22	84.10	360.822	0.697	0.918
23	84.22	362.834	0.725	0.918
24	84.53	362.312	0.714	0.918
25	84.22	363.247	0.659	0.919
26	84.43	368.691	0.621	0.920
27	84.35	363.364	0.656	0.919
28	83.25	393.313	0.058	0.927
29	82.94	389.870	0.148	0.926
30	84.02	364.244	0.628	0.919

CAQ-W: Contrast Avoidance Questionnaire-Worry.

Table 7. Corrected item–total statistics for the CAQ-GE scale

	Mean if item is deleted	Variance if item is deleted	Corrected item–total correlation	Cronbach's alpha if item is deleted
1	58.26	377.357	0.691	0.949
2	58.26	376.768	0.688	0.949
3	57.73	389.471	0.470	0.952
4	59.06	381.469	0.678	0.949
5	59.18	381.374	0.706	0.949
6	58.02	386.790	0.490	0.951
7	59.05	377.760	0.731	0.949
8	58.71	376.160	0.684	0.949
9	59.01	378.553	0.694	0.949
10	58.69	374.137	0.702	0.949
11	57.78	386.270	0.489	0.951
12	59.03	377.165	0.764	0.948
13	58.67	376.148	0.694	0.949
14	57.63	389.120	0.409	0.953
15	58.12	382.183	0.582	0.950
16	58.93	376.626	0.772	0.948
17	58.33	380.496	0.613	0.950
18	59.01	374.765	0.799	0.948
19	57.74	388.170	0.463	0.952
20	58.89	374.021	0.770	0.948
21	59.23	382.013	0.685	0.949
22	59.12	377.642	0.724	0.949
23	57.85	389.206	0.428	0.952
24	58.79	374.320	0.776	0.948
25	58.97	374.959	0.764	0.948

CAQ-GE: Contrast Avoidance Questionnaire-General Emotion.

and 0.95 for the total score. These values show that both scales have high internal consistency results.

Tables 6 and 7 present the descriptive analysis results for the CAQs, including corrected item–total correlations and Cronbach's alpha coefficients after item deletion. For the CAQ-W scale, the corrected item–total correlations ranged from 0.06 to 0.72. The removal of any individual item did not significantly affect internal consistency, with Cronbach's alpha values ranging from 0.918 to 0.927 after deletion, compared with an overall alpha of 0.921. Only items 8, 28, and 29 had corrected item–total correlations below the recommended threshold of 0.30.

For the CAQ-GE scale, the corrected item–total correlations ranged from 0.40 to 0.80, indicating that strong item discrimination is acceptable. The scale's internal consistency remained high regardless of item removal, with Cronbach's alpha values ranging from 0.948 to 0.953 following item deletion and an overall alpha of 0.950. None of the items fell below the 0.30 threshold, suggesting that all items contributed meaningfully to the overall scale reliability.

Table 8. Results of the test–retest analysis of the CAQ-W and CAQ-GE

	1	2	3	4
1. CAQ-W_1	1			
2. CAQ-W_2	0.777**	1		
3. CAQ-GE_1	0.515**	0.534**	1	
4. CAQ-GE_2	0.566**	0.649**	0.829**	1

CAQ-W_1: Contrast Avoidance Questionnaire - Worry (first measurement); CAQ-W_2: Contrast Avoidance Questionnaire - Worry (second measurement); CAQ-GE_1: Contrast Avoidance Questionnaire – General Emotions (first measurement); CAQ-GE_2: Contrast Avoidance Questionnaire – General Emotions (second measurement). P<0.05; **: P<0.01.

Test–Retest Reliability

This study aimed to perform a test–retest analysis to evaluate the temporal stability of the CAQ-W and CAQ-GE forms. Both scales were administered to 20 participants for the second time, 1 month after their initial completion. The correlation coefficients between the two applications of the CAQ-W and CAQ-GE forms were statistically significant and positive. The correlation coefficient between time 1 and 2 was r=0.78 (p<0.001) for "CAQ-W" and r=0.83 (p<0.001) for "CAQ-GE" (Table 8).

DISCUSSION

This study investigated the adaptation, validity, and reliability of the Turkish version of the Contrast Avoidance Questionnaires (CAQs); it was conducted with a sample of 549 healthy Turkish participants. In comparison, the original study included 410 participants for the CAQ-W scale and 126 participants for the CAQ-GE scale (Llera & Newman, 2017), indicating that the Turkish adaptation was tested with a substantially larger sample. To independently validate the factor structure of the CAQs and assess their utility in predicting relevant psychopathological symptoms, statistical analyses were conducted to evaluate internal consistency, temporal stability, construct validity, convergent validity, and predictive validity.

A CFA was conducted using AMOS to assess the construct validity of the Turkish versions of the CAQs. In particular, we examined whether the CAQ-W and CAQ-GE retained their original three-factor and two-factor structures, respectively. Although the Turkish versions exhibited similar factor structures, the fit indices did not meet acceptable thresholds (e.g., χ^2/df=3.77 for CAQ-W and 4.48 for CAQ-GE).

CFA is also useful for identifying measurement errors that arise from semantic and structural similarities between items or from participants' comprehension difficulties (Brown & Moore, 2012). In our analysis of the CAQs, the CFA revealed correlated measurement errors. We introduced covariance between highly correlated error terms as part of a model modification to improve the model fit.

Specific item pairings in the CAQ-W showed high covariance owing to conceptual overlap. Items 6 ("If I worry about the worst outcome…") and 14 ("I am more appreciative…") highlight a conditional, temporal link between worry and increased appreciation of positive outcomes. Items 1 ("Because bad things could happen…") and 2 ("When I'm worrying, …") emphasize the role of worry in providing comfort and emotional control, whereas Items 19 ("Worry to control my own emotions…") and 20 ("I feel like I have more control over the situation…") emphasize the function of worry in perceived control. Items 24 ("I prefer to worry rather than feel optimistic…") and 27 ("A part of me prefers to be worried…") reflect a preference for worry when anticipating negative events, whereas Items 28 ("Worrying is an unpleasant …") and 29 ("Worrying increases…") capture negative beliefs about worry.

After correcting these measurement errors, the χ^2/df value dropped to an acceptable level (χ^2/df=2.97); other fit indices also fell within acceptable ranges (GFI=0.87, CFI=0.91, IFI=0.91, and RMSEA=0.06). These results indicate that the three-factor structure of the Turkish version of the CAQ-W can be used similarly to the original scale.

A similar pattern of high covariance appeared in the CAQ-GE between Items 1–2, 4–5, 21–22, and 19–23. The shared variance in Items 1 ("I focus on the negative...") and 2 ("I tend to expect the worst…") may stem from overlapping semantics, whereas Items 4 ("I would rather feel bad now…") and 5 ("Because bad things could happen…") emphasize a negative emotional stance. Items 19 ("Fluctuations in my emotions bother me") and 23 ("Strongly fluctuating emotions are…") reflect discomfort with emotional fluctuations. In addition, the consecutive placement of Items 21 ("I would rather feel down…") and 22 ("Allowing myself to feel happy…") may have contributed to their high covariance.

After correcting these measurement errors and conducting subsequent analyses, the fit indices for the two-factor model of CAQ-GE were found to be within acceptable values (χ^2/df=2.73, GFI=0.90, CFI=0.95, IFI=0.95, and RMSEA=0.05).

The Turkish versions of the CAQ-W and CAQ-GE were assessed by comparing their results with various anxiety and depression measures. The findings indicated that both Turkish CAQs showed strong psychometric properties, exhibiting high internal consistency (reliability), and appropriate correlations with other measures (validity).

One of the most notable findings in the correlation analysis concerns the second factor of the CAQ-W. In particular, the second factor of the CAQ-W ("worry creates and sustains negative emotion") did not exhibit a significant correlation with

either the other two factors of the CAQ-W or the two factors of the CAQ-GE. Although this finding is noteworthy, it should be replicated in future studies, particularly with clinical samples.

However, recent research (Rashtbari et al, 2023; White et al, 2020) on the CAQs suggests that their factor structures may vary and that alternative configurations yield better model fit indices. One of the most significant modifications in this context is the transformation of the CAQ-W scale into a two-factor structure while retaining all items. Future studies should re-evaluate the validity and reliability of this newly proposed two-factor model in clinical and non-clinical samples within the Turkish population.

Furthermore, the correlation between the second factor of the CAQ-W and other variables was weaker than that between the other factors of the CAQ. This finding suggests that this factor may function independently of other factors, which warrants further investigation in future research. Conversely, the CAQ-W and CAQ-GE scores exhibited strong correlations with the anxiety and depression measures. However, the CAQ-GE demonstrated even stronger associations, showing significant correlations with nearly all anxiety and depression measures, surpassing those observed for the CAQ-W.

Significant positive correlations were found between the AAQ-II and WW-II scales and the subdimensions of the CAQ scales, except for the correlation between WW-II and the second factor of CAQ-W. This result aligns with expectations, as AAQ-II measures psychological inflexibility. Controlling, reducing, preventing, or eliminating negative internal experiences constitutes a core dimension of psychological inflexibility. In this regard, the CAQ scale can be considered a measure of strategies aimed at regulating emotions, particularly to avoid experiences such as disappointment. In addition, the tendency to use worry as a strategy to shield oneself from unwanted emotions or situations may reinforce positive beliefs about worry. Therefore, the observed positive correlation with WW-II, which assesses the degree of such beliefs, is theoretically anticipated.

In the original development study (Llera & Newman, 2017), the test–retest analysis was conducted with 124 ethnically diverse participants (e.g., Caucasian, African American, and Asian) 1 week apart, yielding reliability coefficients of r=0.90 for CAQ-W and r=0.93 for CAQ-GE. In the current study, the test–retest reliability coefficients were slightly lower (CAQ-W: r=0.78; CAQ-GE: r=0.83), with a more homogeneous and smaller sample that lacked racial diversity. The smaller sample size is considered acceptable given the homogeneous structure of the group. Furthermore, administering the retest 1 month apart, rather than 1 week apart, may have contributed to more reliable results compared with the original study.

The hierarchical regression analysis revealed that CAQ-GE was a stronger predictor of depression (DASS-D), general distress (SCL-D), general anxiety (SCL-A), state anxiety (STAI-II), and stress (DASS-S). In contrast, the CAQ-W was more closely associated with worry (PSWQ-A) and anxiety symptoms (DASS-A); however, the CAQ-GE remained the strongest predictor across all variables.

Moreover, these findings align with previous research, including the Iranian adaptation study of the CAQ (Rashtbari et al, 2023), where the CAQ-W was found to be a better predictor of anxiety-related measures such as the PSWQ-A and GAD-7, whereas the CAQ-GE was a stronger predictor of depressive symptoms and broader emotional distress (e.g., social phobia, depression, and the Obsessive-Compulsive Inventory). Similarly, other studies (Llera & Newman, 2017; White et al, 2021) have consistently shown that CAQ-W is more closely linked to anxiety, whereas CAQ-GE is a stronger predictor of depression and general emotional dysregulation.

Collectively, these findings strengthen the argument that CAQ-GE may play a more significant role in predicting depressive symptoms, whereas CAQ-W is more relevant for anxiety-related processes, reinforcing the distinction between these two regulatory mechanisms.

Limitations and Recommendations

This study has several limitations. One of the primary limitations of this study is the reliance on self-report measures. Although self-report tools provide valuable subjective data, they are prone to biases, such as social desirability and recall errors. For more reliable results, future studies could incorporate structured clinical interviews with individuals meeting the criteria for GAD to more objectively assess their worry behaviors. Additionally, alternative methodologies, such as Ecological Momentary Assessment (EMA), could be used to capture real-time worry patterns in daily life. Studies have supported the contrast avoidance hypothesis of the CAM (White et al, 2021). Another limitation concerns the scope of the sociodemographic data collected; more comprehensive reporting (e.g., education and employment status) would allow for a better contextualization of the findings. Studies have supported the contrast avoidance hypothesis of the CAM (White et al, 2021).

Another limitation is that the psychometric properties of the CAQ scales were only examined in a non-clinical sample. Notably, the CAQ-GE does not solely focus on worry but also comprehensively measures the tendency to avoid contrast. This suggests that certain psychological disorders or populations may rely on mechanisms other than generating negative emotions to prevent negative contrast (Llera & Newman, 2017). Previous research (Llera et al, 2016) found

that while the CAQ-GE significantly predicted GAD and depressive symptoms, the CAQ-W was specifically predictive of GAD. Future research should investigate contrast avoidance tendencies in clinical populations in Türkiye to further clarify the role of this mechanism across various disorders.

Recent studies have introduced modifications to the factor structure of the CAQ scales (Rashtbari et al, 2023; White et al, 2021). Future research should examine the validity of these newly proposed factor structures within the Turkish population to ensure their applicability and psychometric robustness.

Furthermore, this study not only contributes to the Turkish literature by introducing the CAM scales but also highlights the potential clinical significance of CAM. When addressed with traditional methods aimed at reducing worrisome behavior, GAD is often regarded as a treatment-resistant disorder. Viewing individuals with GAD through the CAM framework—understanding worry as an emotionally protective function—could offer valuable insights for treatment (Newman & Llera, 2017).

In summary, the findings of this study provide strong evidence that the Turkish versions of CAQ-W and CAQ-GE exhibit high psychometric integrity. Utilizing these scales with Turkish samples could lay the groundwork for future research in this field.

CONCLUSION

The Turkish CAQ-W (χ^2/df=2.97) and CAQ-GE (χ^2/df=2.73) retained their intended factor structures and showed solid psychometric properties—high internal consistency, acceptable 1-month test–retest reliability (r≈0.78–0.83), and theory-consistent links to anxiety (stronger for CAQ-W) and depression/general distress (stronger for CAQ-GE). These findings support the CAM in Turkish non-clinical samples and provide reliable tools for future research. However, replication with clinical groups and evaluation of the new two-factor CAQ-W solution remain important next steps.

Ethics Committee Approval: The Istanbul Medipol University Social and Human Sciences Research Ethics Committee granted approval for this study (date: 29.04.2019, number: 41).

Informed Consent: Written informed consents were obtained from patients who participated in this study.

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