Research

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Turkish Adaptation of the Rugged Resilience Measure: A Validity and Reliability Study

İçsel Psikolojik Dayanıklılık Ölçeği'nin Türkçe Uyarlaması: Geçerlik ve Güvenirlik Çalışması

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ABSTRACT

Objective: The aim of this study was to adapt the Rugged Resilience Measure (RRM), developed to assess resilience through internal psychological resources in line with contemporary socio-ecological approaches, into Turkish and to examine its validity and reliability.

Method: The study was conducted with an adult sample within an acculturation context. Construct validity was examined using Confirmatory Factor Analysis (CFA). Reliability was assessed using Cronbach's alpha coefficients. Criterion-related validity was evaluated by examining the associations between RRM scores and measures of life satisfaction and psychological well-being.

Results: Confirmatory Factor Analysis supported the original one-factor structure of the Turkish version of the RRM and indicated an acceptable model fit (χ^2/df = 2.554, CFI = .944, RMSEA = .063, SRMR = .043). Measurement invariance was supported across gender and cultural background groups. The scale demonstrated good internal consistency (Cronbach's α = .88). In addition, RRM scores were positively and moderately associated with life satisfaction (r = .34, p < .001) and psychological well-being (r = .60, p < .001).

Conclusion: The Turkish version of the Rugged Resilience Measure (RRM) is a valid and reliable instrument for assessing individual resilience based on internal psychological resources. The findings indicate that the scale consistently measures the internal component of resilience in culturally diverse contexts.

Keywords: Resilience, internal psychological resources, scale adaptation, validity and reliability

ÖZ

Amaç: Bu çalışmanın amacı, bireysel dayanıklılığı güncel sosyo-ekolojik yaklaşımlarla uyumlu biçimde, içsel psikolojik kaynaklar temelinde değerlendirmeyi hedefleyen İçsel Psikolojik Dayanıklılık Ölçeği'nin (İPDÖ) Türkçeye uyarlanması ve ölçeğin geçerlik ve güvenirlik özelliklerinin incelenmesidir.

Yöntem: Araştırma, kültürleşme bağlamında yer alan yetişkin bireylerden oluşan bir örneklemle yürütülmüştür. Ölçeğin yapı geçerliği Doğrulayıcı Faktör Analizi ile değerlendirilmiş; güvenirlik analizleri kapsamında Cronbach alfa iç tutarlık katsayıları hesaplanmıştır. Ölçüt bağıntılı geçerlik, İPDÖ puanları ile yaşam doyumu ve psikolojik iyi oluş arasındaki ilişkiler üzerinden incelenmiştir.

Bulgular: Doğrulayıcı Faktör Analizi sonuçları, İPDÖ'nün tek boyutlu orijinal yapısının Türkçe formda doğrulandığını ve modelin kabul edilebilir düzeyde uyum gösterdiğini ortaya koymuştur (χ^2/sd = 2,554, CFI = ,944, RMSEA = ,063, SRMR = ,043). Cinsiyet ve kültürel geçmiş grupları arasında ölçüm değişmezliğinin sağlandığı belirlenmiştir. Ölçeğin iç tutarlığı iyi düzeyde bulunmuş (Cronbach alfa = ,88) ve İPDÖ puanlarının yaşam doyumu (r = ,34, p < ,001) ile psikolojik iyi oluş (r = ,60, p < ,001) arasında pozitif yönlü, orta düzeyde ve anlamlı ilişkiler gösterdiği saptanmıştır.

Sonuç: İPDÖ Türkçe formu, bireysel dayanıklılığı içsel psikolojik kaynaklar temelinde değerlendiren geçerli ve güvenilir bir ölçme aracıdır. Bulgular, ölçeğin kültürel çeşitliliğin söz konusu olduğu bağlamlarda içsel dayanıklılık bileşenini tutarlı biçimde ölçebildiğini göstermektedir.

Anahtar sözcükler: Dayanıklılık, içsel psikolojik kaynaklar, ölçek uyarlama, geçerlik ve güvenirlik

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Introduction

Exposure to adversity and the stress associated with it, varying in both intensity and duration, is considered a natural and inevitable part of human life (Bonanno et al. 2007). Adverse life events may arise in the course of everyday life or stem from more profound and disruptive experiences, such as migration, loss, illness, natural disasters, and war. The detrimental effects of such experiences on healthy development and functioning have long been examined in a substantial body of research, demonstrating that these experiences may constitute developmental risk factors (Shalev et al. 1998, Masten and Reed 2002, Keles et al. 2018).

However, the observation that some individuals are able to maintain their psychological health despite exposure to similar adversities shifted researchers' attention toward understanding how people manage to overcome adversity (Werner 1993, Masten et al. 1999, Bonanno et al. 2007). This shift gradually gave rise to a perspective that focused on positive developmental outcomes and functioning, rather than viewing adverse life experiences solely in terms of pathology and negative outcomes (Leadbeater et al. 2005). Resilience research conducted toward the end of the twentieth century played an important role in this paradigm shift. Longitudinal studies of children growing up under adverse conditions, such as poverty, homelessness, or parental mental illness, demonstrated that a substantial proportion of these children were able to achieve good levels of competence while maintaining healthy developmental trajectories (Werner 1993, Masten et al. 1999, Masten 2001). With the adoption of this more holistic approach, in which individuals' strengths were considered alongside risk factors (Rutter 2012), it became possible to systematically conceptualize and assess resilience.

In the present study, resilience is used as an overarching concept referring to an individual's capacity to adapt in the face of adversity. In the literature, psychological resilience generally focuses on an individual's cognitive, emotional, and behavioral coping resources, whereas resilience is conceptualized more broadly as a construct encompassing the interplay between individual and environmental processes (Luthar et al. 2000, Rutter 2012). Within this framework, internal psychological resilience refers to the component of this broader resilience framework associated with individual and psychological resources, whereas social-ecological resilience refers to the component based on resources available through the individual's social and cultural environment.

This conceptual framework has been shaped by substantial developments and transformations in the conceptualization of resilience over time. Indeed, over the past three decades, resilience has evolved into an increasingly comprehensive approach that provides a holistic framework for promoting human health and well-being; at the same time, its examination from different theoretical perspectives has contributed to growing conceptual diversity (Windle et al. 2011, Masten et al. 2021).

Early research conceptualized resilience as a relatively stable personality trait that enables individuals to recover rapidly following adverse experiences and maintain functioning (Kobasa 1979, Connor and Davidson 2003). Within this perspective, resilience was attributed to internal characteristics that individuals either possess innately or develop over time (Hirano 2011). However, resilience does not imply remaining unaffected by stressful experiences; rather, it refers to the capacity to recover relatively quickly despite being affected by such experiences and to continue with life by adapting to them (Bonanno et al. 2011).

Over time, a distinct paradigm shift occurred in the conceptualization of resilience (Leadbeater et al. 2005). With this shift, resilience came to be understood not merely as a stable individual trait, but as a dynamic process that may vary across circumstances and over time (Luthar et al. 2000). Contemporary perspectives therefore conceptualize resilience not as a personality trait, but as a set of processes that enable positive adaptation despite risks that threaten an individual's development, or as the outcome of these processes (Rutter 2012). These processes are shaped by the interplay between individual and environmental resources. Within this holistic framework, internal and social-ecological resilience are not independent constructs; rather, they represent complementary components of resilience operating at different levels of analysis.

For resilience to be considered, an individual must have experienced, either currently or in the past, some form of risk or threat. In the absence of risk factors, positive outcomes are more appropriately understood as competence or successful adaptation rather than resilience (Masten et al. 1999). This distinction represents a fundamental difference between resilience-focused research and research on healthy development more generally. In this context, groups with a heightened likelihood of experiencing risk and threat, such as individuals with a migration background, those socialized across multiple cultures, and ethnic minorities, constitute important populations in resilience research (Castro and Murray 2010, Nguyen and Benet-Martínez 2010).

Just as identifying risks is essential, identifying the protective factors that contribute to an individual's ability to maintain functioning is also critical to understanding resilience. Protective factors are conceptualized as individual and environmental resources that contribute to an individual's capacity to adapt even under high-risk conditions (Masten and Reed 2002). These resources are considered alongside elements of social-ecological resilience, which encompass the cultural context (Ungar 2008).

Influenced by ecological systems perspectives, resilience research has increasingly adopted a view that emphasizes the multilayered interactions between individuals and their environments (Masten et al. 2021, Ungar 2021). From this perspective, resilience emerges through interactions among multiple systems, including individual-level factors and resources provided by family, community, and cultural contexts. Individual and environmental systems should therefore be understood not as mutually exclusive, but as complementary components that enable a holistic understanding of resilience.

This transformation in the theoretical understanding of resilience has also substantially influenced approaches to its assessment and measurement. Accordingly, resilience measures have been developed from different theoretical perspectives, each emphasizing different components of the construct. How resilience should be measured remains an ongoing debate in contemporary literature (Masten et al. 2021). The diversity of available resilience measures largely reflects the theoretical transformations the construct has undergone over time. Whereas early measures conceptualized resilience primarily in terms of individuals' internal characteristics (Connor and Davidson 2003), measures developed with the emergence of process-oriented approaches have broadened the scope of assessment to include environmental resources such as family, social networks, and cultural context (Friborg et al. 2003, Liebenberg et al. 2012).

Windle and colleagues (2011) conducted a psychometric review of widely used resilience measures and concluded that all of these instruments had certain limitations. Although the Connor-Davidson Resilience Scale, the Resilience Scale for Adults, and the Brief Resilience Scale—all of which have also been adapted into Turkish—are psychometrically robust instruments, they have been criticized for not adequately capturing the multidimensional nature of resilience (Windle et al. 2011). These criticisms highlight the need for measures capable of distinguishing between, while also allowing for the joint assessment of, individual and environmental resilience processes.

Recent research on the assessment of resilience in Türkiye underscores the importance of approaches that take into account developmental stage and contextual specificity. In particular, multidimensional measures developed or adapted for later adulthood and aging (Akyol and Şirvanlı Özen 2025, Palanbek Yavaş and Baysan 2025) conceptualize resilience in relation to the developmental and social-ecological characteristics of a particular stage of life. In addition, measures emphasizing interpersonal and contextual dimensions (Aslan and Önal 2026), instruments developed for specific occupational groups (Şenocak et al. 2021), and approaches based on protective factors (Tanko et al. 2021) have also been introduced into the Turkish literature.

Although these studies make important contributions by highlighting the multidimensional nature of resilience, they tend to focus on a particular stage of life, occupational group, or a limited range of social-ecological resources. Thus, there remains a need for measures that can assess individuals' internal resilience characteristics without restriction to a particular age or occupational group and that are suitable for cross-cultural comparisons.

In response to this need, Ungar and colleagues developed two complementary measures designed to assess individual and social-ecological processes involved in resilience. The Child and Youth Resilience Measure (CYRM), which assesses social-ecological resilience, and its adult version are widely used instruments with demonstrated cross-cultural validity (Ungar and Liebenberg 2011, Liebenberg et al. 2012, Liebenberg and Moore 2018). Turkish adaptations of these measures have also been shown to be valid and reliable tools for assessing social-ecological resilience (Arslan 2015a, 2015b). Within this framework, however, measures that provide a brief yet comprehensive assessment of the internal characteristics that support an individual's capacity to cope with adversity, rather than focusing solely on contextual resources, remain limited.

The measure that complements assessments of social-ecological resilience at the individual level by focusing on internal resilience characteristics is the Rugged Resilience Measure (RRM; Jefferies et al. 2022). The RRM was developed to provide a brief yet comprehensive assessment of the internal resources that contribute to an individual's capacity to overcome adversity, thereby serving a complementary function alongside measures of social-ecological resilience. Consistent with contemporary theoretical frameworks that conceptualize resilience as emerging through the interplay between individual and environmental processes, this approach enables the specific assessment of internal resources. Psychometric studies conducted with samples from different countries have demonstrated that the RRM is a valid and reliable measure across cultural contexts (Jefferies et al. 2022, Jefferies et al. 2023).

Research on resilience indicates that protective factors operating at the individual and environmental levels function both independently and in interaction with one another (Jefferies et al. 2023). The effectiveness of intervention programs designed to strengthen resilience depends on the comprehensive assessment of these multilevel processes (Ungar and Jefferies 2021). Although measures of social-ecological resilience are available in the Turkish literature, there remains a need for an instrument that complements the process-oriented approach at the individual level.

The present study therefore aimed to adapt the Rugged Resilience Measure (RRM) into Turkish and examine its validity and reliability. Introducing the Turkish version of the RRM and providing evidence of measurement invariance across different groups will contribute to the brief yet comprehensive assessment of individual resilience resources, thereby supporting a multidimensional and holistic understanding of resilience. Accordingly, the study examined whether the Turkish version of the RRM (a) retained the original one-factor structure, (b) demonstrated adequate validity and reliability, (c) showed theoretically expected associations with life satisfaction and psychological well-being, and (d) demonstrated measurement invariance across gender and cultural background groups. It was expected that the Turkish version of the RRM would retain the original one-factor structure, demonstrate good internal consistency, show significant positive associations with life satisfaction and psychological well-being, and demonstrate measurement invariance across groups.

Method

Sample

Resilience is conceptualized in the context of exposure to risk or stress and refers to processes of positive adaptation despite such conditions. Accordingly, because the present study aimed to assess resilience, the sample consisted of individuals situated within an acculturation context characterized by its own distinct stressors and who had been socialized across multiple cultures (Nguyen and Benet-Martínez 2010). For the purposes of this study, individuals with a migration background, those belonging to one of the ethnic/cultural groups in Türkiye, and those with mixed ethnic/cultural backgrounds were defined as multicultural individuals.

Sample size was determined with reference to the recommended ratio of sample size to the number of parameters estimated in structural equation modeling. Accordingly, given a total of 20 parameters to be estimated in the model, the target was to recruit at least 200 participants, with approximately 400 considered preferable (Jackson 2003). In addition, a post hoc power analysis was conducted using

G*Power 3.1 to evaluate the adequacy of the sample size. Assuming a medium effect size (r = .30), an alpha level of .05, and a sample size of 398, the estimated statistical power was 1.00. These results indicated that the sample size provided adequate statistical power for the analyses conducted in the study.

Eligibility criteria were being 18 years of age or older, residing in Türkiye, reporting good or native-level proficiency in Turkish, and having a multicultural background based on cultural/ethnic origin. Eligibility was assessed based on participants' responses to questions included in the sociodemographic information form. The initial sample consisted of 447 individuals who volunteered to participate and completed the online survey. Of these, 38 participants who did not meet the study's definition of multiculturalism, seven who reported moderate or lower proficiency in Turkish, and four identified as outliers were excluded from the dataset. The final analyses were therefore conducted with data from 398 adult participants (age range = 18–73 years, M = 27.47, SD = 10.23). Of the participants, 73% were women (n = 291) and 27% were men (n = 107). The majority of participants were unmarried (73%) and had an undergraduate degree (78%). Subjective socioeconomic status was assessed using a seven-rung ladder (1 = lowest, 7 = highest), with 86% of participants placing themselves on rungs 3–5, corresponding to the middle range. Ninety percent of the participants were Turkish citizens. All participants reported using Turkish, and 76% reported native-level proficiency in Turkish.With regard to cultural background, 50% of participants belonged to ethnic/cultural groups in Türkiye, 41% had a migration background, and 9% had mixed or other cultural backgrounds. Detailed demographic characteristics of the participants are presented in Table 1.

Table 1. Descriptive statistics for participants' demographic characteristics

Feature	Category	M	SD	n	%
Age		27.47	10.23	398	
Gender	Women			291	73
	Men			107	27
Marital status	Unmarried			291	73
	Married			107	27
Education level	Below high school (literate = 2, primary school = 1, middle school = 7)			10	2
	High school			27	7
	Bachelor's degree			311	78
	Graduate degree			50	13
Subjective socioeconomic status	Rung 1			11	3
	Rung 2			7	2
	Rung 3			59	15
	Rung 4			178	45
	Rung 5			105	26
	Rung 6			22	5
	Rung 7			16	4
Turkish proficiency	Good			46	11
	Very good			50	13
	Native-like			302	76
Turkish citizenship	Yes			357	90
	No			41	10
Cultural background	Migration background			160	41
	Ethnic/cultural groups			201	50
	Mixed ethnic/cultural background			33	8
	Other			4	1

M = mean; SD = standard deviation; N = sample size. Percentages (%) were calculated within the categories of each variable. Subjective socioeconomic status was assessed using a seven-rung ladder metaphor (1 = lowest, 7 = highest). "Ethnic/cultural groups" refers to ethnic and cultural groups with a historical presence in Türkiye.

Procedure

The present study was conducted as a methodological study to examine the validity and reliability of the Turkish version of the RRM. Prior to data collection, the RRM was translated and adapted into Turkish. To ensure that the process was carried out systematically, widely accepted guidelines for scale adaptation were taken into account (Beaton et al. 2000, Sousa and Rojjanasrirat 2011). As the scale manual states that no additional permission is required for the use or adaptation of the RRM, separate permission was not obtained from the authors (Resilience Research Centre 2022). The steps undertaken in the translation and adaptation process are described below.

In the first stage, the original English-language measure was independently translated into Turkish by three expert psychologists proficient in both Turkish and English. In the second stage, the translated versions were compared by the authors, and an initial Turkish translation of the scale was produced through consensus on the wording of the items. In the third stage, the resulting Turkish items were back-translated into English by an academic specializing in English Language and Literature. In the fourth stage, the research team compared the original and back-translated items, and a preliminary Turkish version of the scale was developed after consistency between the two versions had been established.

In the fifth stage, the linguistic and semantic equivalence of the scale was evaluated by five academics in the field of psychology who were proficient in both Turkish and English. The experts were presented with the original and Turkish-translated items side by side and were asked to rate the appropriateness of each item in terms of content and language on a 5-point Likert-type scale ranging from 1 ("not at all appropriate") to 5 ("completely appropriate"). They were also invited to provide alternative translations and comments when they considered these necessary.

Content validity of the Turkish version of the scale was evaluated using the Item-level Content Validity Index (I-CVI) and the Scale-level Content Validity Index (S-CVI). I-CVI values were calculated as the proportion of experts who rated the corresponding item as appropriate (a rating of 4 or 5) to the total number of experts, whereas the S-CVI was calculated as the mean of the I-CVI values across all items. I-CVI values ranged from .80 to 1.00, and the S-CVI was .98. As these values indicated adequate content validity, no revisions to the items were considered necessary (Sousa and Rojjanasrirat 2011).

In the final stage, a preliminary evaluation was conducted to assess the comprehensibility of the scale items with three 35-year-old female participants from different cultural backgrounds, recruited to reflect the target population of the main study. Participants were first presented with the Turkish version of the measure together with its instructions, after which a meeting was held to obtain their feedback on the comprehensibility of the items and the appropriateness of the wording. All participants generally reported that the items were clear and understandable and identified no notable problems. Accordingly, the items were considered appropriate for the Turkish version. This preliminary evaluation did not constitute a comprehensive cognitive debriefing or a pilot study; rather, it was an initial examination conducted to assess whether the items were understandable and appropriately worded.

Ethical approval for the study was obtained from the Social and Human Sciences Ethics Committee of Recep Tayyip Erdoğan University (26 July 2023; No. 2023/226). Data were collected from participants residing in Türkiye via SurveyMonkey, an online survey platform. The online survey was prepared and distributed, and the data collection process was managed by the researchers. Before data collection began, the survey form was reviewed and its online functionality was tested. To prevent multiple participation by the same individual, SurveyMonkey's feature for blocking multiple responses was enabled, and responses to all survey questions were required. Participants were able to return to previous questions and review their responses if they wished.

In the initial stage, participants were recruited through the researchers' personal networks, social media accounts, and associations affiliated with multicultural groups, using convenience and snowball sampling methods. Participants were informed that the study involved scale adaptation, that participation was voluntary, and about the eligibility requirements for the study. They were also asked to complete the online

survey and to share the study link with individuals they considered eligible. No paid promotion or advertising was used in the study.

Participants were able to access the survey questions only after providing informed consent on the first page of the survey, which contained detailed information about the study. Data were collected through a joint online survey comprising two scale adaptation studies conducted within the same session. Because the total number of questions and screens reflected the combined administration of both studies, these figures were not reported specifically for the present study. The survey took approximately 30 minutes to complete. Participants received no payment for their participation. To reach individuals from diverse cultural backgrounds, efforts were made to recruit participants from a range of cities and cultural backgrounds. The data were recorded anonymously and stored in a password-protected digital environment accessible only to the researchers.

Measures

The Rugged Resilience Measure (RRM), Sociodemographic Information Form, Satisfaction with Life Scale, and Flourishing Scale were used in the present study. Immediately prior to data collection, participants were informed about the purpose and scope of the study and were provided with an informed consent form through which they indicated their voluntary agreement to participate.

Sociodemographic Information Form

A sociodemographic information form developed for the present study was used to collect information on participants' age, gender, marital status, education level, socioeconomic status, cultural background, and Turkish language proficiency.

Rugged Resilience Measure (RRM)

The Rugged Resilience Measure (RRM) was developed by Jefferies et al. (2022) to assess internal, personal, or psychological resilience characteristics in a cross-cultural context. The measure assesses 10 internal characteristics that support coping with stressful situations and are assumed to be relatively invariant across cultures (Resilience Research Centre 2022). These characteristics include the ability to cope with stress, adaptability, emotional self-regulation/self-control, meaning making/purpose, motivation/embracing challenges, optimism, perseverance/grit, pride in achievements, problem-solving ability, and self-belief/self-efficacy. Each characteristic is represented by a single item (e.g., "Zorluklarla karşılaştığımda, üstesinden gelirim."). The measure is rated on a 5-point Likert scale (1 = not at all, 5 = a lot).

The psychometric properties of the original measure were examined in samples from seven countries—the United States, China, Indonesia, Nigeria, Mexico, Germany, and Brazil (Jefferies et al. 2022). The analyses supported the one-factor structure of the RRM (CFI = .98, TLI = .97, RMSEA = .05, SRMR = .03) and demonstrated measurement invariance across gender and countries. Internal consistency was reported as Cronbach's alpha = .87 and McDonald's omega = .83 for the total sample. In addition, RRM scores were significantly and positively associated with scores on the Adult Resilience Measure and significantly and negatively associated with social anxiety.

Satisfaction with Life Scale (SWLS)

The Satisfaction with Life Scale (SWLS) was developed by Diener et al. (1985) to assess the cognitive component of subjective well-being. The scale consists of five items rated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). Higher scores indicate greater overall satisfaction with one's life. In the original study, the scale demonstrated good internal consistency, with a Cronbach's alpha coefficient of .87 (Diener et al. 1985). The scale was adapted into Turkish by Yetim (1991), who reported acceptable reliability.

Flourishing Scale (FS)

The Flourishing Scale (FS), developed by Diener et al. (2010), is an 8-item measure designed to assess psychological well-being. Items are rated on a 7-point Likert scale. The original version of the scale

demonstrated good internal consistency, with a Cronbach's alpha coefficient of .87. In the Turkish adaptation conducted by Telef (2013), the internal consistency coefficient was reported as .80.

Statistical Analysis

To evaluate the psychometric properties of the Turkish version of the RRM, analyses of construct validity, measurement invariance, reliability, criterion-related validity, and discriminant validity were conducted. Construct validity was examined using Confirmatory Factor Analysis (CFA) in Mplus 8.10 with the robust maximum likelihood (MLR) estimator. MLR was selected because of its good performance with ordinal data and under mild to moderate departures from normality (Yang and Liang 2013, Li 2016, Kline 2023).

Given that the factor structure of the original scale demonstrated equivalent structural properties across different cultural groups (Jefferies et al. 2022), and that adaptation studies conducted in different cultural contexts have similarly yielded a consistent one-factor structure (Singh et al. 2025, Virlia and Kusuma 2026), the present study aimed to determine whether the existing structure could also be confirmed in the Turkish version. Accordingly, as recommended in the literature (Flora and Flake 2017), CFA was conducted directly on the basis of the original factor structure of the measure. Model fit was evaluated using the chi-square to degrees-of-freedom ratio (χ^2/df), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) as the primary fit indices. Values of χ^2/df between 2 and 3, CFI values above .90, and RMSEA and SRMR values below .08 were considered indicative of acceptable model fit, whereas χ^2/df values below 2, CFI values above .95, and RMSEA and SRMR values below .05 were considered indicative of good model fit (Schermelleh-Engel et al. 2003, Tabachnick and Fidell 2013, Kline 2023).

To examine the equivalence of the scale structure across gender and cultural background, multigroup confirmatory factor analyses were conducted using the MLR estimator. Gender groups were defined as women (n = 291) and men (n = 107). For the analyses by cultural background, the cultural background variable was redefined on the basis of participants' migration histories. Participants who were first-generation migrants themselves or who had at least one parent with a migration background were classified as the "migration-background group" (n = 177). Participants who reported no migration experience associated with their cultural background and belonged to one of the ethnic/cultural groups living in Türkiye were classified as the "non-migrant cultural group" (n = 221). Although the group sizes differed, there is precedent in the literature for considering samples of these sizes adequate for multigroup CFA (Roković et al. 2022).

For the assessment of measurement invariance, configural invariance (unconstrained model), metric invariance (factor loadings constrained to equality), and scalar invariance (item parameters constrained to equality) models were compared sequentially. Measurement invariance was considered to be supported when at least two of the following criteria were met: a nonsignificant chi-square difference test ($p > .05$; Satorra and Bentler 2001), a change in CFI (ΔCFI) of .01 or less, and a change in RMSEA (ΔRMSEA) of .015 or less (Chen 2007).

Reliability, criterion-related validity, and discriminant validity analyses were conducted using IBM SPSS Statistics 20. The internal consistency of the RRM was evaluated using Cronbach's alpha coefficient and corrected item-total correlations. Cronbach's alpha values above .70 were considered acceptable (Taber 2018). Resilience and indicators of positive adaptation are considered overlapping constructs (Luthar et al. 2000). Accordingly, the Satisfaction With Life Scale and the Flourishing Scale, both of which assess constructs frequently reported in the literature to be associated with resilience, were used as criteria for evaluating criterion-related validity (Utsey et al. 2008, Karaırmak 2010, Üzar Özçetin et al. 2019, Padmanabhanunni and Pretorius 2023). The associations between RRM scores and scores on the Satisfaction with Life Scale and Flourishing Scale were examined using Pearson correlation coefficients.

Discriminant validity was evaluated using a cutoff criterion based on Pearson correlation coefficients and Average Variance Extracted (AVE) values obtained from the CFA. Correlations below .80 between two constructs were considered to indicate no problematic overlap in terms of discriminant validity (Rönkkö and Cho 2022). Accordingly, correlations below .80 between the RRM and the constructs of life satisfaction

and psychological well-being were expected to support the distinctiveness of the RRM from these constructs. In addition, according to Fornell and Larcker (1981), discriminant validity is supported when the AVE of a construct is greater than the variance it shares with other constructs (i.e., the squared correlation). Accordingly, the AVE for the RRM was expected to exceed the variance shared with life satisfaction and psychological well-being.

Results

Prior to the psychometric analyses, the data were examined in preliminary analyses to assess whether the assumption of univariate normality was met. Skewness values for the RRM items ranged from –1.441 to –.387, and kurtosis values ranged from –.375 to 2.122. These values indicated no substantial violation of normality in the dataset and suggested that the assumption of univariate normality was met to an acceptable degree (Kline 2023: 59–60; Tabachnick and Fidell 2013: 79–83).

Construct Validity

Confirmatory Factor Analysis (CFA) was conducted to examine whether the one-factor structure of the original RRM could be confirmed in the Turkish version. The CFA model for the one-factor structure of the measure is presented in Figure 1. Evaluation of the results based on the fit indices indicated that the CFA model demonstrated an acceptable fit to the data (χ^2/df = 2.554, p < .001, CFI = .944, RMSEA = .063, SRMR = .043). Modification indices were examined; however, no additional modifications were made because the model fit indices were within the acceptable range. Standardized factor loadings ranged from .40 to .78, and all factor loadings in the model were statistically significant (p < .001). These findings indicated that the one-factor structure of the RRM was retained in the Turkish version.

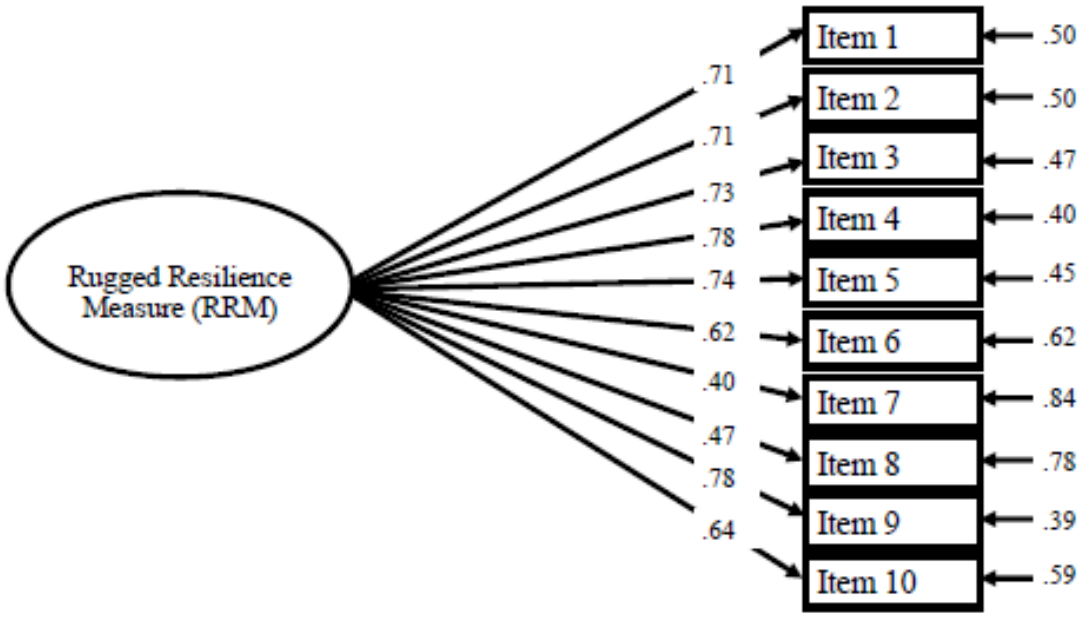


Figure 1. Confirmatory factor analysis model of the Rugged Resilience Measure (RRM)

Multiple-group confirmatory factor analyses were conducted to examine measurement invariance across gender and cultural background. Configural, metric, and scalar invariance models were tested sequentially. For gender, the unconstrained configural model initially demonstrated an acceptable fit to the data (χ^2/df = 1.904, p < .001, CFI = .940, RMSEA = .067, SRMR = .049). Next, the metric model, in which factor loadings were constrained to be equal across groups, was compared with the configural model. The chi-square difference test was not significant ($\Delta\chi^2$ (9) = 4.264, p = .893), and changes in model fit indices remained below the recommended cutoff values (ΔCFI = .003, ΔRMSEA = –.006), supporting metric invariance. Finally, to test scalar invariance, item thresholds were constrained to equality across groups, and the

resulting model was compared with the metric model. The chi-square difference test was not significant ($\Delta\chi^2$ (9) = 16.422, p = .059). Changes in model fit indices were also within acceptable limits (ΔCFI = –.007, ΔRMSEA = .001), providing support for scalar invariance.

Analyses conducted across cultural background groups yielded similar results. The configural model demonstrated an acceptable fit to the data (χ^2/df = 1.817, p < .001, CFI = .943, RMSEA = .064, SRMR = .050), and comparison with the metric model indicated that the chi-square difference test was not significant ($\Delta\chi^2$ (9) = 8.803, p = .456). In addition, changes in the fit indices remained below the recommended cutoff values (ΔCFI = .000, ΔRMSEA = –.003), supporting metric invariance. Similarly, the results for the scalar invariance model indicated that scalar invariance was also supported ($\Delta\chi^2$(9) = 7.003, p = .636, ΔCFI = .000, ΔRMSEA = –.003). Taken together, these findings provide strong evidence for measurement invariance of the scale across groups.

Reliability

Analyses of the reliability of the Rugged Resilience Measure indicated good internal consistency, with a Cronbach's alpha coefficient of .88. Item–total correlations for the 10-item scale ranged from .39 to .72 (see Table 2). Examination of the item–total correlations indicated that all items demonstrated acceptable levels of discrimination. The lowest item–total correlation was observed for Item 7 (.39); however, this item did not adversely affect the overall internal consistency of the scale. In addition, removal of any individual item did not result in a meaningful increase in Cronbach's alpha. Taken together, these findings indicate that the 10-item, unidimensional structure of the scale demonstrates an acceptable level of internal consistency.

Table 2. Descriptive statistics, item analysis, and internal consistency coefficient for the Rugged Resilience Measure

Item	M	SD	Item–Total Correlation	Cronbach's Alpha if Item Deleted
1. Kendime inanıyorum.	4.33	.77	.68	.86
2. Zorlu durumlara uyum sağlayabilirim.	4.24	.79	.63	.86
3. Karşılaştığım sorunlara çözümler bulurum.	4.25	.77	.66	.86
4. Zorluklara rağmen devam edebilirim.	4.20	.83	.70	.86
5. Çelişen taleplerle başa çıkabilirim (zamanım veya dikkatimle ilgili).	3.93	.84	.67	.86
6. Aksilikler veya engeller olduğunda bile, geleceğim konusunda umutluyum.	3.81	1.06	.60	.87
7. Genellikle duygularıma hâkimim.	3.66	1.07	.39	.88
8. Başardığım şeylerle gurur duyarım.	4.35	.85	.45	.87
9. Zorluklarla karşılaştığımda, üstesinden gelirim.	4.21	.75	.72	.86
10. Hayatımda anlam bulabilirim.	4.13	.89	.63	.86

M = mean; SD = standard deviation. Item–total correlations are corrected values. Cronbach's alpha for the total scale was .88.

Criterion-Related Validity

Within the scope of criterion-related validity, positive, moderate, and statistically significant correlations were found between the total Rugged Resilience Measure score and life satisfaction (r = .34, p < .001) and psychological well-being (r = .60, p < .001). These findings provide support for the criterion-related validity of the measure. Descriptive statistics for the RRM, for which validity and reliability analyses were conducted, and the standard measures used in the criterion-related validity analyses are presented in Table 3.

Discriminant Validity

To evaluate discriminant validity, the relationships of the RRM with life satisfaction and psychological well-being were first examined. The results showed that the correlations with both constructs were below the

recommended threshold of .80 for discriminant validity (Rönkkö and Cho 2022). In addition, the AVE value of the RRM was compared with the variance it shared with life satisfaction and psychological well-being. The RRM was found to share approximately 12% of its variance with life satisfaction and approximately 36% with psychological well-being. Furthermore, the AVE value for the RRM was calculated as .45 and was higher than the variance shared with both constructs. These results support that, although the RRM is related to life satisfaction and psychological well-being, it does not fully overlap with these constructs and is empirically distinguishable from them (Fornell and Larcker 1981).

Table 3. Descriptive statistics for the measures used in the study (N = 398)

Measure	M	SD	Min.	Max.	Skewness	Kurtosis	α
RRM	4.11	.60	2.30	5.00	-.461	-.252	.88
SWLS	4.31	1.26	1.00	7.00	-.368	-.323	.85
FS	5.50	.91	2.75	7.00	-.641	.048	.86

RRM = Rugged Resilience Measure; SWLS = Satisfaction with Life Scale; FS = Flourishing Scale; M = mean; SD = standard deviation; Min. = minimum; Max. = maximum; α = Cronbach's alpha coefficient

Discussion

In this study, the validity and reliability of the Turkish version of the Rugged Resilience Measure (RRM), developed on the basis of contemporary approaches that conceptualize resilience within a socio-ecological framework, were examined in a sample within an acculturation context, consisting predominantly of women, young adults, and highly educated individuals. The original contribution of the study lies in providing a brief, easy-to-administer measure suitable for cross-cultural comparisons to assess the individual and internal component of resilience, in line with the contemporary literature conceptualizing resilience as a process shaped across multiple systems.

The results of the Confirmatory Factor Analysis conducted to examine construct validity showed that the one-factor structure reported for the original measure was also retained in the Turkish version. This finding is consistent with the theoretical assumption that the internal characteristics underlying individual resilience operate as an integrated construct rather than as separate dimensions. Socio-ecological approaches, which conceptualize resilience as being shaped through the interaction of multiple systems (Ungar 2008, Masten et al. 2021), emphasize that individual resilience is not independent of environmental and contextual resources, but can nevertheless be conceptualized as a distinct component.

Measurement invariance analyses conducted across gender and cultural background in the present study showed that the measure exhibited a similar factor structure across different subgroups. This finding provides additional evidence that the unidimensional structure of the RRM is equivalent across gender and groups with different cultural backgrounds and that the measure may be suitable for studies involving comparisons across these groups (Jefferies et al. 2022, Singh et al. 2025).

The confirmation of the structural properties of the RRM in its Turkish version, together with its similar structural properties across groups within different acculturation contexts, suggests that this internal component can be measured consistently across cultures. This finding is consistent with the measurement invariance reported across seven countries in the original validation study (Jefferies et al. 2022) and with findings from adaptation studies conducted in different cultural contexts (Wedyaswari et al. 2024, Singh et al. 2025, Virlia and Kusuma 2026). In particular, the preservation of the structure in a sample comprising individuals with different acculturation experiences suggests that individual resilience, although influenced by contextual factors, may exhibit a measurable internal organization.

Reliability analyses of the Turkish version of the RRM indicated that the measure had good internal consistency. This finding suggests that the items consistently reflect a common construct of individual resilience and is consistent with findings from the original study and other cultural adaptations (Jefferies et al. 2022, Wedyaswari et al. 2024). Despite its brevity, the measure demonstrated good psychometric properties, offering an important advantage in terms of practical use in both research and applied settings.

Item-level findings showed that Item 7 ("Genellikle duygularıma hâkimim") had relatively lower values than the other items in terms of both factor loading (.40) and item–total correlation (.39). This finding is also consistent with results reported in the original scale development study and adaptation studies conducted in different cultural contexts (Jefferies et al. 2022, Wedyaswari et al. 2024, Singh et al. 2025, Virlia and Kusuma 2026). This suggests that the item may represent the latent construct measured by the RRM to a relatively more limited extent than the other items. Nevertheless, the item–total correlation was above the acceptable threshold (> .30), and the factor loading was within acceptable limits, indicating that Item 7 did not adversely affect the overall integrity or psychometric properties of the measure.

Additionally, the fact that this item had the lowest mean score (3.66) indicates that participants endorsed this statement to a more limited extent than the other items. Its relatively high standard deviation (SD = 1.07) also suggests some variability in participants' responses. This pattern may be related to the fact that "emotion regulation and emotional control" are constructs that can be influenced by individual experiences and cultural norms, suggesting that this item may have been evaluated more heterogeneously within the sample than the other items.

The cultural psychology literature indicates that individualistic and collectivistic orientations play a role in shaping emotional experiences and emotion regulation strategies (Kitayama and Park 2007). However, differences in emotion regulation strategies may also be observed even among individuals sharing the same cultural orientation. Indeed, while emotional suppression may emerge as a more common strategy in contexts characterized by collectivistic and hierarchical orientations, this tendency has been reported to be relatively lower in contexts characterized by more egalitarian orientations (Klein et al. 2024).

Similarly, Ungar (2008) emphasizes that cultural and contextual characteristics are key factors in determining individuals' access to resilience resources and how they use these resources. Consistent with this view, the original validation study of the RRM showed that, although the overall structure of psychological or "internal" resilience was retained across different countries, some differences emerged in scores at both the item and overall scale levels (Jefferies et al. 2022). The authors attributed these differences to the possibility that resilience resources may be interpreted differently even within the same country. Similarly, given the culturally heterogeneous nature of the sample in the present study, variability in responses concerning emotional control may be expected in relation to cultural norms and individual differences in emotion regulation strategies. In this context, the item in question may be particularly sensitive to cultural interpretation.

In a similar vein, the relatively high mean scores observed for some items in the present study may be related to cultural and contextual characteristics. Cultural contexts may encourage individuals to rely more strongly on certain internal resources when coping with stress, which may in turn be reflected in response patterns (Jefferies et al. 2022). Moreover, given that the acculturation process inherently involves stress and demands for adaptation, it may be associated with a greater reliance on internal resources in such samples. Moreover, because acculturation inherently involves demands for adaptation and may entail stress, internal resources may become more salient in such samples. Indeed, evidence suggests that resilience-related capacities may become more active in the face of adversity (Karaırmak and Figley 2017).

The findings regarding criterion-related validity indicated significant, moderate associations between rugged resilience and life satisfaction and psychological well-being, consistent with theoretical expectations. The resilience literature has long emphasized that the capacity for positive adaptation in the face of adverse life circumstances is associated with psychological well-being and life satisfaction (Luthar et al. 2000, Masten 2001). The present findings support this perspective and are consistent with results reported in both general populations and groups exposed to risk (Utsey et al. 2008, Tümlü and Recepoğlu 2013, Padmanabhanunni and Pretorius 2023,). The moderate magnitude of these associations further supports the view that the construct measured by the RRM is related to, yet distinct from, indicators of well-being (Rönkkö and Cho 2022).

In Türkiye, most studies assessing resilience have been conducted within the context of specific life stages, occupational groups, or contextual characteristics (Şenocak et al. 2021, Tanko et al. 2021, Akyol and Şirvanlı Özen 2025). Although these studies highlight different levels at which resilience can be

assessed, they are generally limited by the specificity of their samples. By demonstrating the associations between rugged resilience and indicators of well-being among individuals in an acculturation context, the present study suggests that individual resilience resources may play a distinct and complementary role across different contexts.

Nevertheless, the study has several limitations related to its methodology, sample, and the context in which it was conducted. The use of convenience and snowball sampling to recruit participants constitutes a limitation in terms of random selection. Future studies are therefore encouraged to employ probability sampling methods.

Although efforts were made to recruit a sample with diverse demographic and cultural characteristics, the study sample consisted predominantly of young adult women with high levels of education, which represents another limitation of the study. This limits the generalizability of the findings beyond the characteristics of the present sample. In particular, the unequal proportions of women and men should be taken into account when interpreting the findings regarding measurement invariance across gender. The restriction of the study to an acculturation context is another consideration regarding the generalizability of the findings. Future studies are encouraged to examine the Turkish version of the RRM in the general population and in samples encompassing different risk groups, clinical populations, age groups, and genders to obtain more generalizable findings.

Given that acculturation may involve stress and that resilience-related capacities may become more active in the face of stressful life events, the relatively high scores on the scale items may be associated with the context in which the present study was conducted (Karaırmak and Figley 2017). Although greater reliance on resilience-related resources may theoretically be expected in stressful contexts, the relatively high item scores may produce a potential ceiling effect, thereby limiting the scale's ability to differentiate between individuals at higher levels of rugged resilience. From this perspective, future studies examining the psychometric properties of the scale across different contexts and in groups with greater heterogeneity in levels of stress would be valuable.

In addition to these limitations, the absence of a separate test–retest reliability study, the lack of a comprehensive pilot study evaluating the preliminary psychometric properties of the scale, and the use of only positive indicators in the assessment of criterion-related validity constitute further limitations of the present study. Future studies are encouraged to address these limitations to allow for a more comprehensive psychometric evaluation of the scale.

Conclusion

The present study demonstrates that the Turkish version of the RRM, developed in line with socio-ecological approaches to resilience, exhibits valid and reliable psychometric properties in this sample of predominantly young adult, highly educated women in an acculturation context. The preservation of its unidimensional structure and findings consistent with the cross-cultural literature support the measurability of the internal component of individual resilience across different contexts.

The RRM can be considered a brief and practical measure that complements multilevel models of resilience by focusing on internal resources at the individual level. This construct may contribute to the examination of individual resources involved in developmental processes of resilience in both research and mental health practice. The present study offers a modest but meaningful contribution to strengthening a socio-ecological approach in research conducted with samples in acculturation contexts in Türkiye.

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Addendum 1. Turkish Version of the Rugged Resilience Measure

Instructions

Please indicate how well each of the following statements describes you using the response scale below.

	Hiç Tanımlamıyor (1)	Çok Az Tanımlıyor (2)	Biraz Tanımlıyor (3)	Tanımlıyor (4)	Tamamen Tanımlıyor (5)
Kendime inanıyorum.	1	2	3	4	5
2. Zorlu durumlara uyum sağlayabilirim.	1	2	3	4	5
3. Karşılaştığım sorunlara çözümler bulurum.	1	2	3	4	5
4. Zorluklara rağmen devam edebilirim.	1	2	3	4	5
5. Çelişen taleplerle başa çıkabilirim (zamanım veya dikkatimle ilgili).	1	2	3	4	5
6. Aksilikler veya engeller olduğunda bile, geleceğim konusunda umutluyum.	1	2	3	4	5
7. Genellikle duygularıma hâkimim.	1	2	3	4	5
8. Başardığım şeylerle gurur duyarım.	1	2	3	4	5
9. Zorluklarla karşılaştığımda, üstesinden gelirim.	1	2	3	4	5
10. Hayatımda anlam bulabilirim.	1	2	3	4	5

Scoring

There are no reverse-scored items. Total scores range from 10 to 50, with higher scores indicating higher levels of internal psychological resilience.