



Examining The Factorial Structure and Measurement Invariance of The Arabic Versions of The Perceived Stress Scale, The Compulsive Buying Scale, and Ruminative Responses Scale

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Abstract:

Objective: This study aimed to translate the Perceived Stress Scale, the Compulsive Buying Scale, and the Ruminative Responses Scale into Arabic, confirm their factorial structure, assess reliability, and examine measurement invariance across genders.

Methods: A five-stage translation and verification process resulted in Arabic versions of the scales. A study was conducted using a sample of Saudi adults (N=500) to evaluate their psychometric properties. Confirmatory factor analyses, measurement invariance, and internal consistency reliability assessments were employed for validation.

Results: For the Perceived Stress Scale, the measurement model with two correlated factors provided a good fit (CFI = .93, AGFI = .91, IFI = .93, TLI = .92, RMSEA = .063). Strict invariance was held across genders (CFI = .914, RMSEA = .045), with a Cronbach's alpha of .84. For the revised Edwards Compulsive Buying Scale, the model with four correlated factors showed a good fit (CFI = .94, AGFI = .91, IFI = .94, TLI = .92, RMSEA = .057). Strict invariance was achieved across genders (CFI = .913, RMSEA = .044), and Cronbach's alpha was .84. For the Ruminative Responses Scale, the model with two correlated factors indicated a good fit (CFI = .97, AGFI = .94, IFI = .97, TLI = .95, RMSEA = .063). Strict invariance was attained across genders (CFI = .973, RMSEA = .033), with a Cronbach's alpha of .85.

Conclusions: The results support the robustness and utility of these scales for research and clinical settings for Arabic-speaking populations in Saudi Arabia.

Key Words: stress, compulsive shopping, rumination, scale validation, factorial invariance.

فحص البنية العاملية وتكافؤ القياس للنسخة العربية من مقياس الضغوط المدركة، ومقياس الشراء القهري، ومقياس الاستجابات الاجترارية لدى البالغين السعوديين

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المستخلص:

الأهداف: هدفت هذه الدراسة إلى ترجمة مقياس الضغوط المدركة، ومقياس الشراء القهري، ومقياس الاستجابات الاجترارية إلى اللغة العربية، بالإضافة إلى التحقق من البنية العاملية، وتقييم الثبات، وفحص تكافؤ القياس بين الجنسين لهذه المقاييس.

المنهجية: تم اتباع عملية ترجمة دقيقة ذات خمس مراحل لإنتاج النسخ العربية من المقاييس. وقد أجريت الدراسة على عينة من البالغين السعوديين (N=500). تم استخدام التحليل العاملي التوكيدي، وتكافؤ القياس، وثبات الاتساق الداخلي للتحقق من الخصائص السيكومترية للمقاييس.

النتائج: بالنسبة لمقياس الضغوط المدركة، كان نموذج القياس ذو العاملين المترابطين هو الأكثر مطابقة للبيانات (CFI = 0.93)، (RMSEA = 0.063)، كذلك حقق المقياس تكافؤ القياس الصارم بين الجنسين (CFI = 0.914, RMSES = 0.045)، ومعامل كرونباخ ألفا (α = .84). فيما يتعلق بمقياس الشراء القهري، أظهر نموذج القياس ذو الأربعة العوامل المترابطة ملاءمة جيدة للبيانات (CFI = 0.94, RMSEA = 0.057)، كما حقق المقياس تكافؤ القياس الصارم بين الجنسين (CFI = 0.913, RMSEA = 0.044)، ومعامل كرونباخ ألفا (α = .84). وبالنسبة لمقياس الاستجابات الاجترارية، أظهر نموذج القياس ذو العاملين المترابطين ملاءمة جيدة للبيانات (CFI = 0.97, RMSEA = 0.063)، وحقق المقياس تكافؤ القياس الصارم بين الجنسين (CFI = 0.973, RMSEA = 0.033)، وكان معامل كرونباخ ألفا (α = .85).

الخلاصة: تدعم هذه النتائج قوة وفائدة هذه المقاييس في الأبحاث والممارسات السريرية للمتحدثين باللغة العربية في المملكة العربية السعودية.

الكلمات المفتاحية: مقياس الإجهاد المدرك، مقياس الشراء القهري، مقياس التفكير الاجتراري، الخصائص السيكومترية، تكافؤ القياس.

1. Introduction

Individual's emotions and behaviors are impacted by their thoughts. Perceived stress, compulsive buying, and rumination serve as examples of the interconnection between thoughts, emotions, and behavior. Compulsive shopping may provide a temporary escape or distraction from stress, whereas rumination may be a cognitive attempt to address perceived stressors. However, there is a lack of Arabic-language instruments for rumination, compulsive buying, and perceived stress, despite the importance of these factors in creating a treatment plan during therapy sessions. The following is an overview of perceived stress, compulsive buying, and rumination.

1.1 Perceived Stress:

Stress is a multifaceted phenomenon that involves biological, psychological, and environmental components. This highlights how complex stress is and how research must take a comprehensive approach. The work of Cohen and Kessler (1997) and Kopp et al. (2010) contributed significantly to our understanding of stress and its diverse manifestations in health outcomes. Researchers are still investigating the complex interactions between these viewpoints to obtain a more comprehensive knowledge of stress and its implications for health. (Cohen, Janicki-Deverts, & Miller, 2007).

It has been reported that the higher stressed is associated with low self-efficacy in problem-solving (Leung, Lam, & Chan, 2010), and a prediction of less success in improving the behavior (Glasgow, 1985). Moreover, stress also impacts the individual's adjusting to new environmental challenges and impact their physical health and academic and career performance. Several research have found that stress is linked to depression, low quality of life, suicidality, drugs, and alcohol addiction (Denovan, Dagnall, Dhingra, & Grogan, 2019; James, et al. 2017; Rith-Najarian, Boustani, Chorpita, 2019; and Lu, et al., 2017). Thus, assessing the perceived stress is mandatory to predict several mental health disorders.

The Perceived Stress Scale (PPS), developed by Cohen et al. (1983), is widely used for evaluating psychological stress. This self-administered survey gauges how stressed individuals perceive their lives, emphasizing overwhelming experiences, lack of control, and unpredictable events from the

previous month. The PSS avoids a restricted focus on events by being general in nature. There are three versions: the original 14-item scale (PSS-14), a 10-item version (PSS-10) developed five years later through factor analysis, and a brief 4-item version (PSS-4) for concise scales or telephone interviews (Cohen & Williamson, 1988). Cohen's Laboratory for the Study of Stress, Immunity, and Disease (2012) notes that the PSS is translated into 25 languages beyond English, such as Chinses (Lee & Crockett, 1994), Japanese (Mimura & Griffiths, 2004), Persian (Maroufizadeh, Zareiyan, & Sigari, 2014), Spanish (Ramírez & Hernández, 2007), and Swedish (Eskin & Parr, 1996).

Therefore, it is important to validate the Perceived Stress Scale to assure its robustness and accuracy as a tool for measuring perceived stress in research and clinical settings.

1.2 Compulsive Buying:

In the modern consumer culture, shopping is essential to daily living and the economy. When there are so many options, shopping is more than simply making purchases. Notably, it has become a form of entertainment and a satisfying experience (Mukhopadhyay and Johar, 2009). Consequently, this has led to a minority of people developing a habit that, if not addressed appropriately, can result in compulsive buying (CB).

The common definition of compulsive buying behavior was introduced for the first time by McElroy et al. (1994) and define as “a maladaptive preoccupation with purchasing or shopping”. This behavior has negative consequences that impede daily functioning and cause financial difficulties. The prevalence of this problems was reported in several countries, such as in Italy the rate in the general population was 11.3% (Villella et al., 2011), in Spain was 7.1% (Otero-López & Villardefrancos, 2014), in the United States was 5.8% (Koran, Faber, Aboujaoude, Large, & Serpe, 2006), and 1-8% in Germany in the general population (Mueller et al., 2010). Although this issue is significant, there is a limited number of assessment and research that focused on compulsive buying in Arabic population.

Compulsive buying (CB) is not explicitly classified in the DSM-5 (American Psychiatric Association, 2013), It is an impulse-control disorder characterized by urges that cause detrimental actions that are beyond the

individual's control. It has been viewed as a behavioral addiction because of impulsivity and repetitive nature of this behavior.

The impact of compulsive buying is often underestimated, in a study involving 24 individuals with CB (Christenson et al., 1994) revealing that excessive shopping can result in substantial debts, guilt, financial issues, peer criticism, and legal problems. Furthermore, people with CB frequently feel an increasing need or anxiety that can only be satisfied by making a purchase. (Black, 2007). According to Black et al. (1998), Compared to people without CB, those with CB have a three times more likely increased risk of developing an eating disorder, a more than two times increased risk of substance abuse, and a higher risk of mood and anxiety disorders.

The Edwards Compulsive Buying Scale (Edwards, 1993) is a recognized and validated instrument that could contribute to our understanding of compulsive buying behavior and its implications. Hence, there is a need to validate it in Arab population to ensure the accuracy, reliability, and credibility of research findings.

1.3 Rumination:

Psychologists have focused their attention on understanding how individuals respond to their thoughts and feelings, as well as the coping mechanisms used, such as distraction, problem-solving, and rumination. (Nolen-Hoeksema, 1991). Among these mechanisms, rumination stands out as a well-studied approach, defined by repetitive and passive reflection on the causes, consequences, and meaning of sadness and depression. During therapy sessions, it has been observed that clients may engage in rumination by posing questions like, "Why am I sad? Why can't I live happily? What is happening to me?"

Rumination is a repetitive and passive fixation on distress symptoms, including their causes and effects. While individuals who engage in rumination may perceive it as problem-solving, a habitual tendency toward rumination is associated with heightened levels of sadness, distress, and anxiety (Michl et al., 2013). Although rumination is not classified as a mental disorder in the DSM-5, it is recognized as a cognitive pattern and a vulnerability factor for various mental disorders, particularly depression.

Failure to actively address rumination in treatment has been linked to slower symptom reduction and a poorer response to therapy. It is essential to measure rumination on a regular basis to track its evolution and acquire understanding of how well patients are responding to treatment. Moreover, individuals who face ruminations find themselves caught in cycles of ruminative thoughts, affecting their ability to engage in productive problem-solving actions (Nolen-Hoeksema, 2004). Furthermore, rumination has been associated with several mental health disorders, such as eating disorders, addictions, anxiety disorders, and self-harm (Nolen-Hoeksema & Harrell, 2002; Nolen-Hoeksema et al., 2008).

It is essential to assess the psychometric properties of the Ruminative Responses Scale (Treynor et al., 2003) in Arab population due to its clinical implications, as high levels of rumination are often associated with increased vulnerability to several mental health issues.

The objectives of this study go beyond mere translation; they include translating the Perceived Stress Scale (PSS), the Edwards Compulsive Buying Scale Revised, and the Ruminative Responses Scale (RRS) into Arabic, followed by a comprehensive validation process. This involves confirming their factorial structure through confirmatory factor analysis, assessing measurement invariance across gender, and evaluating internal consistency reliability. The overarching goal is to provide culturally valid, reliable, and psychometrically sound Arabic versions of these scales that can be confidently used in both research and clinical practice. Ultimately, this work aims to enhance the precision of psychological assessments, facilitate large-scale investigations into stress, compulsive buying, and rumination within Arabic-speaking populations, and support the development of culturally tailored interventions. By doing so, it seeks to advance scientific understanding and improve mental health services across the region.

The significance of this study stems from the pressing need to provide reliable and validated measurement tools for assessing psychological and behavioral variables within Arabic-speaking populations, particularly in Saudi Arabia where there is an increasing demand for instruments with high psychometric standards. Although some Arabic scales are available in the existing literature, many have not undergone comprehensive evaluation of their

factorial structure or measurement invariance across relevant demographic groups, such as gender. This limits their efficacy and reliability when applied in research and clinical settings. Consequently, this study contributes critically to the field by validating and confirming the psychometric properties of carefully translated and culturally adapted scales, thereby expanding the arsenal of scientifically sound tools available for researchers and mental health practitioners in the Arab context.

2. Research Questions:

1. Does the Arabic version of the Perceived Stress Scale (PSS) demonstrate factorial validity, measurement invariance across gender, and reliability in the Saudi population?
2. Does the Arabic version of the Edwards Compulsive Buying Scale Revised demonstrate factorial validity, measurement invariance across gender, and reliability in the Saudi population?
3. Does the Arabic version of the Ruminative Responses Scale (RRS) demonstrate factorial validity, measurement invariance across gender, and reliability in the Saudi population?

3. Research Terminology:

- *Perceived Stress* is defined as "the degree to which situations in one's life are appraised as stressful" (Cohen, Kamarck, & Mermelstein, 1983, p. 385), and is measured procedurally by a respondent's score on the Perceived Stress Scale (PSS). The PSS items measure the degree to which respondents found their lives unpredictable, uncontrollable, and overloading.
- Edwards (1993, p. 67) defined *Compulsive Buying* as "an abnormal form of consumer spending" which afflicts many individuals who, as a result, often find themselves in deep debt. It is an abnormal form of shopping and spending in which the afflicted consumer has an overpowering, uncontrollable, chronic, and repetitive urge to shop and spend; compulsive spending characteristically functions as a means of alleviating negative feelings of stress and anxiety."
- Rumination is defined as "a method of coping with negative mood that involves self-focused attention" (Lyubomirsky & Nolen-Hoeksema, 1993, p. 247). This coping style is characterized by both self-reflection (Morrow & Nolen-Hoeksema, 1990) and a repetitive, passive focus on one's negative emotions (Nolen-Hoeksema, 1991, 2000; Nolen-

Hoeksema, Larson, & Grayson, 1999; Nolen-Hoeksema, Parker, & Larson, 1994, p. 247).

4. Methods

4.1 Study Design:

cross-sectional measure validation study.

4.2. Participants

The sample comprised 500 participants (125 males, 375 females), ranging in age from 18 to 78 years ($M = 31.95$, $SD = 11.09$). In terms of educational attainment, a majority of the sample (52.2%) held a high school diploma, with 23.3% possessing a bachelor's degree and 23.5% holding postgraduate degrees. A small proportion (13.3%) had not completed high school. Data on monthly household income indicated that 27.7% of participants earned between 5000 and 10000 Saudi Riyal, 26.3% earned over 20000 Saudi Riyal, 17.9% earned less than 5000 Saudi Riyal, and 14.7% earned between 10000 and 15000 Saudi Riyal. The majority of the sample (60.2%) resided in the Makkah region. Regarding employment status, 32.6% were students, 31% were employed, 18% were unemployed, and 10.5% were retired. Participants were recruited online between June 2023 and September 2023, with questionnaires distributed via email and social media platforms (i.e., WhatsApp, Telegram, and Twitter). Participation was voluntary, and assurances of confidentiality and anonymity were provided.

4.3. Instruments

4.3.1 Demographic Questionnaire

Including questions regarding participants' gender, age, education, employment status, and monthly income.

4.3.2 Perceived Stress Scale (PSS)

A fourteen-item measure of the degree to which situations in one's life are appraised as stressful (7 items reflect negative perception: 1,2,3,8,11,12,14, and 7 items reflect positive Perception: 4,5,6,7,9,10,13). The PSS uses a timeframe of one month (i.e. In the last month, how often have you been upset because of

something that happened unexpectedly?). The PSS had adequate Coefficient alpha reliability ($\alpha = .84$), and the test-retest correlation was .85. It is scored on a five-point Likert-scale, 0 (“Never”), 1 (“Almost never”), 2 (“Sometimes”), 3 (“Fairly often”), and 4 (“Very often”), while positive items (4, 5, 6, 7, 9, 10 and 13) scored reversely. Scores range from (0 to 56), with higher scores indicating higher levels of perceived stress (Cohen et al., 1983; Cohen, 1988).

4.3.3 The Edwards Compulsive Buying Scale Revised

The original 29 items Edwards Compulsive Buying Scale (Edwards, 1993) was revised (Maraz et al., 2015). The revised version comprised 16 items distributed into four dimensions; Lack of Control (items 1, 2, and 3) refers to uncontrolled spending habits, Mood Modification (items 4, 5, 6, 7, 8, 9, and 10) refers to the irresistible urge and mood elevating effect of shopping activity, Guilt (items 11, 12, and 13) contains items related to shame and regret, and Unnecessary Buying (items 14, 15, and 16) reflects the fact that the emphasis is the shopping activity itself rather than items bought. The Edwards Compulsive Buying Scale Revised had Cronbach’s alpha reliability of 0.87 for the whole scale. Participants’ responses are based on a 7-point Likert-type scale from 1 (strongly disagree) to 7 (strongly agree). Scores range from (16 to 112), with higher scores indicating higher levels of compulsiveness in buying behavior.

4.3.4 Ruminative Responses Scale (RRS)

The short version of Ruminative Responses Scale (Treynor et al., 2003) contains ten-items scale that measures the individuals’ tendency to ruminate when they feel down, sad, or depressed. This scale comprises two subscales: Brooding (items 1, 3, 6, 7, 8) and Reflection (items 2, 4, 5, 9, 10). The alpha coefficient was .90 and the test-retest correlation was .67. Participants rated each item on a 4-point scale from (1 = “almost never”) to (4 = “almost always”). Scores range from (10 to 40), with higher scores indicating higher levels of ruminative thinking.

4.4 Translation and Cross-Cultural Adaptation procedures

The English versions of the scales used in the study were adapted and translated following the published guidelines for the cross-cultural adaptation of self-reported measures by Beaton et al. (2000). (1) Initial translation. Forward translation of The Perceived Stress, The Compulsive Buying, and Ruminative

Responses scales from English into Arabic by two native Arabic-speaking translators fluent in English. One of these translators was familiar with the subject and the constructs that are being assessed, while the second translator was unaware of the concepts addressed. To ensure a greater cultural fit, both translators avoided literal translation of items. (2) Synthesis of the translations. The two translators and a recording observer sat down to synthesize the results of the translations and resolve any discrepancies. This procedure led to the first Arabic consensus version. (3) Back translation. Two translators, without prior knowledge of the original version or the concepts examined, independently translated the Arabic version back to English. The goal was to evaluate the extent to which the translated version reflects the item content of the original version. It is important to note that back translation does not imply that an item must remain literally identical to the original but rather it must maintain a conceptual equivalence (Borsa et al, 2012). (4) Expert committee. The expert committee, comprising a methodologist, the principal investigator, language professional, and four translators, reviewed all versions and components of the original scales and the translations. They reached consensus on the final wording to be used in the Arabic versions of the scales. The goal was to achieve the maximum semantic, idiomatic, experiential, and conceptual equivalence between the English and Arabic versions. (5) Test of the prefinal version. The prefinal version was tested in a sample of 40 subjects. Participants who completed the scales were interviewed about their understanding of each item, the wording, the response alternatives, and if they had any suggestions for revision. Appendices (A),(B), and (C) present the final Arabic versions of the study scales.

4.5 Data Analysis

4.5.1 Confirmatory factor analyses (CFA)

CFA were conducted to assess the structure of the Perceived Stress scale, the Compulsive Buying scale, and Ruminative Responses scale. Two correlated factors measurement model for Perceived Stress scale, four correlated factors measurement model for Compulsive Buying scale, and two correlated factors measurement model for Ruminative Responses scale were examined to establish the best-fitting. Model fit was assessed based on several indices, including the χ^2 significance test, the comparative fit index (CFI), the Adjusted

Goodness of Fit index (AGFI), the Incremental Fit Index (IFI), the Tucker Lewis index (TLI), and the root mean square error of approximation (RMSEA). For the χ^2 test, a non-significant χ^2 indicates that the model can reasonably reproduce the population covariance matrix (Harlow, 2014), however, it is sensitive to sample size. Values over .90 for CFI, AGFI, TLI (Byrne, 1994) and IFI (Bollen's, 1989) indicate an adequate fit. For RMSEA, values closer to zero indicate good fit, with values less than .08 considered acceptable (Kline, 2011).

4.5.2 Measurement Invariance

Four levels of invariance were examined in sequential order with each level requiring more constraints (Tan & Pektaş, 2020): (1) configural invariance (factor structures between groups are equivalent, the same items have nonzero loadings on the same factors); (2) Metric Invariance (factor loadings are constrained); (3) Scalar Invariance (factor loadings, factor variances and covariances are constrained) (4) Strict Invariance (factor loadings, factor variances and covariances are constrained , and error variances are constrained). In addition to the model fit indices (CFI and RMSEA), the difference in CFI (Δ CFI) values between the higher level model and the lower level of invariance was calculated. A difference of .01 or smaller indicates that the null hypothesis of invariance should not be rejected and that the model demonstrates invariance (Cheung & Rensvold, 2002). Each invariance procedure was evaluated across males and females for the Perceived Stress scale, the Compulsive Buying scale, and Ruminative Responses scale.

4.5.3 Scale Reliability

The internal consistency reliabilities of the Perceived Stress scale, the Compulsive Buying scale, and Ruminative Responses scale were assessed with Cronbach's coefficient Alpha.

5. Results

5.1 The Perceived Stress Scale (PSS)

5.1.1 Confirmatory Factor Analysis

CFA was conducted on the fourteen-item of the Perceived Stress scale (N=500). The measurement model with two correlated factors, consisting of seven items each for Negative Perception and Positive Perception provided a good fit for the data, $\chi^2 (76) = 215.575$, $p < .001$; CFI = .93, AGFI = .91, IFI = .93, TLI = .92, RMSEA = .063 [90% CI = .049, .078]. These indices suggest that the model is well-structured, capturing the underlying constructs effectively. Figure (1) displays the measurement model for the Perceived Stress scale with standardized parameter estimates.

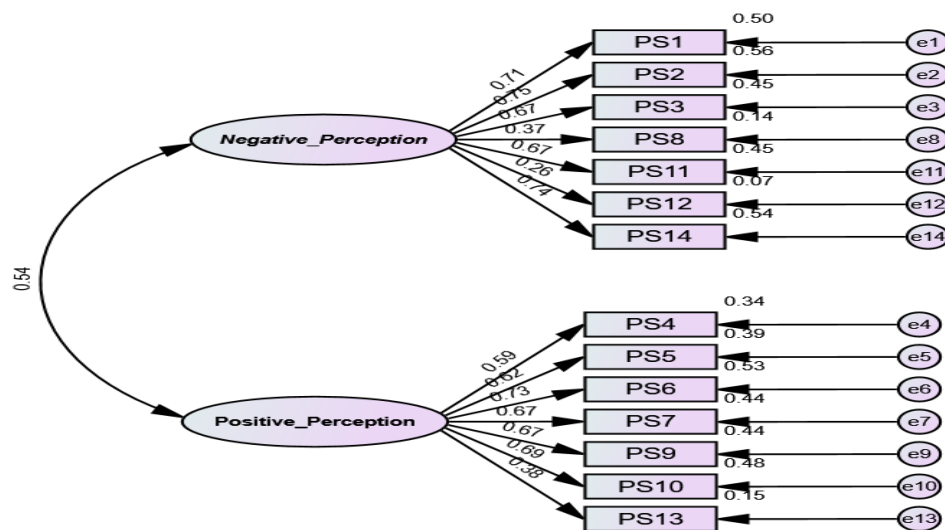


Figure (1): The measurement model for the Perceived Stress scale with standardized parameter estimates

5.1.2 Measurement Invariance

Multiple group confirmatory factor analysis was used to test hierarchical measurement invariance for the Perceived Stress scale across males (n=125) and females (n=375). Strict invariance was held (CFI = .914; RMSEA = .045 [90% CI: .039, .052]). The fit indices for the invariance models are summarized in Table (1).

Table (1): Goodness-of-fit statistics for four invariance models across Gender: The Perceived Stress scale

Scale	Model	CFI	Δ CFI	RMSEA	[90% CI]
The Perceived Stress Scale	Configural Invariance	.920	-	.048	[.040,.055]
	Metric Invariance	.917	0.003	.047	[.040,.054]
	Scalar Invariance	.916	0.001	.046	[.040,.053]
	Strict Invariance	.914	0.002	.045	[.039,.052]

Note. Males ($n=125$) and Females ($n= 375$).

These findings suggest that the scale reliably measures perceived stress similarly across male and female groups, which is crucial for making valid comparisons between these groups. The negligible changes in CFI across the invariance models further support the robustness of the scale.

5.1.3 Reliability

Cronbach's coefficient alphas were calculated ($N= 500$) for the Perceived Stress scale ($\alpha = .84$), and for each subscale with values of ($\alpha = .80$) for Positive Perception and ($\alpha = .81$) for Negative Perception. These values reflect a high level of consistency within the scale, ensuring that it is a reliable measure for the Saudi population.

5.2 The Edwards Compulsive Buying Scale Revised

5.2.1 Confirmatory Factor Analysis

CFA was conducted on the sixteen-item of the revised Edwards Compulsive Buying scale ($N=500$). The measurement model with four correlated factors (Lack of Control, Mood Modification, Guilt, and Unnecessary Buying) showed a good fit for the data, $\chi^2 (97) = 256.175$, $p < .001$; CFI = .94, AGFI = .91, IFI = .94, TLI = .92, RMSEA = .057 [90% CI = .049, .066]. These indices suggest that the model adequately represents the observed data structure. Figure (2) displays the measurement model for the Edwards Compulsive Buying scale with standardized parameter estimates.

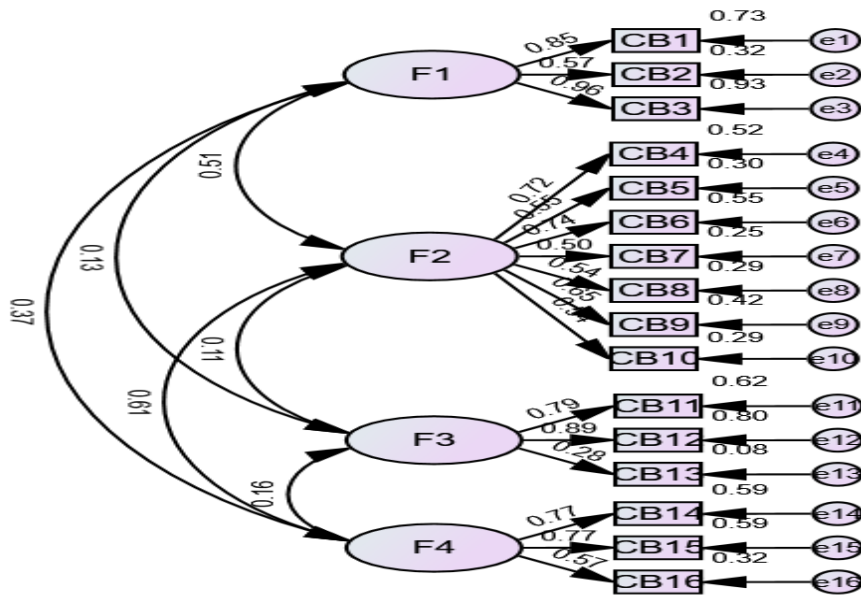


Figure (2): The measurement model for the Edwards Compulsive Buying with standardized parameter estimates.

5.2.2 Measurement Invariance

Multiple group confirmatory factor analysis was used to examine hierarchical measurement invariance for the Edwards Compulsive Buying scale across males ($n=125$) and females ($n=375$). Strict invariance was achieved ($CFI=.913$; $RMSEA=.044$ [90% CI: .038, .050]). The fit indices for the invariance models are summarized in Table (٢).

Table (2): Goodness-of-fit statistics for four invariance models across Gender: The Edwards Compulsive Buying scale

Scale	Model	CFI	ΔCFI	RMSEA	[90% CI]
The Edwards Compulsive Buying Scale Revised	Configural Invariance	.933	-	.042	[.036,.049]
	Metric Invariance	.930	0.003	.042	[.036,.048]
	Scalar Invariance	.922	0.008	.043	[.037,.049]
	Strict Invariance	.913	0.009	.044	[.038,.050]

Note. Males ($n=125$) and Females ($n= 375$).

These results suggest that the metric properties of the scale are maintained across genders, allowing for meaningful comparisons.

5.2.3 Reliability

Cronbach's coefficient alphas were calculated ($N=500$) for the Compulsive Buying scale ($\alpha = .84$), and for each subscale with values of ($\alpha = .73$) for Lack of Control, ($\alpha = .82$) for Mood Modification, ($\alpha = .67$) for Guilt, and ($\alpha = .76$) for Unnecessary Buying. These alpha values indicate good internal consistency.

5.3 Ruminative Responses Scale (RRS)

5.3.1 Confirmatory Factor Analysis

CFA was conducted on the ten-item of the short version of Ruminative Responses scale ($N=500$). The measurement model with two correlated factors, consisting of five items each for Brooding and Reflection indicated a good fit for the data, $\chi^2(31) = 92.700$, $p < .001$; CFI = .97, AGFI = .94, IFI = .97, TLI = .95, RMSEA = .063 [90% CI = .049, .078]. These indices indicate a well-fitting model that effectively represents the data structure. Figure (3) displays the measurement model for the Ruminative Responses scale with standardized parameter estimates.

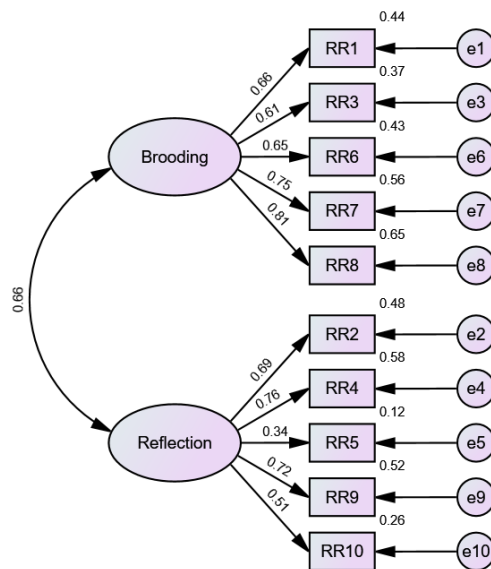


Figure (3): The measurement model for the Ruminative Responses scale with standardized parameter estimates.

5.3.2 Measurement Invariance

Multiple group confirmatory factor analysis was used to assess hierarchical measurement invariance for the Ruminative Responses scale across males (n=125) and females (n=375). Strict invariance was attained (CFI =.973; RMSEA = .033 [90% CI: .021, .044]). The fit indices for the invariance models are summarized in Table (3).

Table (3): Goodness-of-fit statistics for four invariance models across Gender: The Ruminative Responses scale

Scale	Model	CFI	Δ CFI	RMSEA	[90% CI]
Ruminative Responses Scale	Configural Invariance	.968	-	.042	[.030,.054]
	Metric Invariance	.970	0.002	.038	[.027,.050]
	Scalar Invariance	.971	0.001	.037	[.025,.048]
	Strict Invariance	.973	0.002	.033	[.021,.044]

Note. Males (n=125) and Females (n= 375).

This invariance indicates that the scale's measurement characteristics remain consistent across genders, allowing for valid comparisons in ruminative tendencies.

5.3.3 Reliability

Cronbach's coefficient alphas were calculated (N= 500) for the Ruminative Responses scale ($\alpha = .85$), and for each subscale with values of ($\alpha = .82$) for Brooding and ($\alpha = .76$) for Reflection. These values indicate an adequate level of consistency for the Saudi population.

6. Discussion

The purpose of this study was two-fold: to translate the Perceived Stress scale, the Compulsive Buying scale, and Ruminative Responses scale into Arabic language, as well as, to examine the factorial structure, reliability, and measurement invariance of the Arabic versions of these scales in Saudi sample.

The overall psychometric properties of these scales were satisfactory. The results revealed that the Perceived Stress scale, the Compulsive Buying scale, and Ruminative Responses scale were reliable and valid instruments. In addition, the establishment of the highest level of measurement invariance indicated that these constructs were being measured similarly across males and females, suggesting that any observed gender differences may not be attributed to gender bias.

Regarding the Perceived Stress scale, this study supported the two-factor structure of the fourteen-item version of PSS, which was confirmed by most previous validation studies with different populations (Andreou et al., 2011; Cohen & Williamson, 1988; Ezzati et al., 2014; González, 2006; Huang et al., 2020; Jovanovic & Gavrilov-Jerkovic, 2015; Lee, Chung, Suh & Jung, 2015; Leung, Lam & Chan, 2010; Mimura & Griffiths, 2004; Ramírez & Hernández, 2007). Consistent with prior studies, Cronbach's alpha reliability coefficients demonstrate that the Perceived Stress scale and its two subscales showed an excellent consistency. In line with former studies (Ahmed, 2023; Lavoie & Douglas, 2012), invariance analyses showed that the fourteen-item Perceived Stress scale with two correlated subscales demonstrated strict measurement invariance across males and females in population-based sample of Saudi adults. Overall, these results support the psychometric soundness of the Perceived Stress Scale, indicating that it is both a valid and reliable tool for assessing perceived stress across genders. This information is valuable for researchers and practitioners who wish to utilize the scale for understanding stress-related phenomena in diverse populations.

For the Compulsive Buying scale, the results provide evidence to support the four-dimensional structure of the sixteen-item from Edwards Compulsive Buying scale revised version, that was obtained with (Maraz et al., 2015) study. Moreover, while most subscales demonstrate adequate reliability, the Guilt subscale's alpha indicates room for improvement, suggesting potential variability in how respondents interpret or respond to these items. Additionally, invariance analyses showed that the fourteen-item Edwards Compulsive Buying scale with four correlated subscales demonstrated strict measurement invariance between Saudi men and women. These findings support the use of the Edwards Compulsive Buying Scale Revised as a robust tool for assessing compulsive buying behavior across diverse gender groups. This facilitates its use in both

research and clinical settings to explore gender differences and inform interventions focused on compulsive buying tendencies.

As for the Ruminative Responses scale, the current study confirms the two-factor structure of the ten-item short version of RRS, which was supported by previous CFA studies with different populations (Cova Solar, Erdur-Baker & Bugay, 2010; Hasegawa, 2013; He et al., 2021; Hervás, 2008; Lei et al., 2017; Lucena-Santos et al., 2018; Parola et al., 2017; Rincon, & Melipillán, 2007; Ruiz et al., 2017; Treynor et al., 2003). Cronbach's alpha reliability coefficients reveal that the Perceived Stress scale and its two subscales showed a sufficient consistency, replicating previous studies. In agreement with several studies (He et al., 2021; Lei et al., 2017; Ruiz et al., 2017), invariance analyses showed that the ten-item Ruminative Responses scale with two correlated subscales demonstrated strict measurement invariance across genders in sample of Saudis. In sum, these findings support the Ruminative Responses Scale as a reliable and valid tool for assessing ruminative thought patterns across gender groups.

7. Conclusion

The current study provides evidence that the Arabic versions of Perceived Stress scale, Compulsive Buying scale, and Ruminative Responses scale have excellent psychometric properties, along with measurement invariance across gender in a population-based Saudi sample. However, this study possesses some limitations that should be taken into consideration when interpreting the results. One limitation of this study is that this was a cross-sectional sample; future research is needed to assess the stability of these measures in samples over time. Also, this study focuses on a population-based sample; these scales should undergo additional validation with clinical sample. In addition, further studies need to examine measurement invariance of these scales with different types of samples. To conclude, this study supported the underlying structure, internal consistency reliability, and measurement invariance across genders of the Arabic versions of Perceived Stress scale, Compulsive Buying scale, and Ruminative Responses scale, thus they can be used in future research and clinical practice settings.

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Informed Consent Statement

An electronic informed consent was obtained from all subjects participated in the study.

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Conflicts of Interest

The authors declare no conflict of interest.

Appendices

Appendix A: The Perceived Stress Scale original and translated items.

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate. For each question choose from the following alternatives: never (0), almost never (1), Sometimes (2), fairly often (3), very often (5)

فيما يلي مجموعة من الأسئلة عن مشاعرك وأفكارك خلال الشهر الماضي. سيُطلب منك تحديد مدى تكرار شعورك أو تفكيرك في كل سؤال. على الرغم من أن بعض الأسئلة متشابهة، إلا أن هناك اختلافات بينهما ويجب التعامل مع كل سؤال بشكل مستقل. لا توجد إجابة صحيحة أو خاطئة، ومن الأفضل الإجابة بسرعة على كل سؤال. اختار أكثر بديل ينطبق عليك من البدائل التالية: أبداً (0)، نادراً (1)، أحياناً (2)، غالباً (3)، دائماً (4)

No.	Original items (English)	Translated items (Arabic)
1	In the last month, how often have you been upset because of something that happened unexpectedly?	خلال الشهر الماضي ، ما مدى تكرار شعورك بالضيق بسبب حدوث شيء غير متوقع؟
2	In the last month, how often have you felt that you were unable to control the important things in your life?	خلال الشهر الماضي ، ما مدى تكرار شعورك بأنك غير قادر على التحكم في الأشياء المهمة في حياتك؟
3	In the last month, how often have you felt nervous and "stressed"?	خلال الشهر الماضي ، ما مدى تكرار شعورك بالعصبية والضغط؟
4	* In the last month, how often have you dealt successfully with irritating life hassles?	* خلال الشهر الماضي ، ما مدى تكرار نجاحك في التعامل مع متاعب الحياة المزجة؟
5	* In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?	* خلال الشهر الماضي، ما مدى تكرار شعورك بأنك تأقلمت بفعالية مع التغييرات المهمة التي حدثت في حياتك؟
6	* In the last month, how often have you felt confident about your ability to handle your personal problems?	* خلال الشهر الماضي، ما مدى تكرار شعورك بالثقة في قدرتك على التعامل مع مشاكلك الشخصية؟
7	* In the last month, how often have you felt that things were going your way?	* خلال الشهر الماضي ، ما مدى تكرار شعورك بأن الأمور تسير كما تريد؟
8	In the last month, how often have you found that you could not cope with all the things that you had to do?	خلال الشهر الماضي ، ما مدى تكرار شعورك بعدم قدرتك على التعامل مع كل الأشياء التي يجب عليك القيام بها؟
9	* In the last month, how often have you been able to control irritations in your life?	* خلال الشهر الماضي ما مدى تكرار تمكنك من السيطرة على الأشياء المزجة في حياتك؟
10	* In the last month, how often have you felt that you were on top of things?	* خلال الشهر الماضي ، ما مدى تكرار شعورك بأن الأمور تحت السيطرة؟
11	In the last month, how often have you been angered because of things that happened that were outside of your control?	خلال الشهر الماضي ، ما مدى تكرار شعورك بالغضب بسبب حدوث أشياء لا يمكنك التحكم فيها؟

No.	Original items (English)	Translated items (Arabic)
12	In the last month, how often have you found yourself thinking about things that you have to accomplish?	خلال الشهر الماضي ، ما مدى تكرار تفكيرك في أشياء يتعين عليك إنجازها ؟
13	*In the last month, how often have you been able to control the way you spend your time?	* خلال الشهر الماضي ، ما مدى تكرار تمكنك من التحكم في الطريقة التي تقضي بها وقتك؟
14	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	خلال الشهر الماضي ، ما مدى تكرار شعورك بأن الصعوبات تتراكم عليك بشكل كبير بحيث لا يمكنك التغلب عليها؟

* Scored in the reverse direction.

Appendix B: The Edwards Compulsive Buying Scale Revised original and translated items.

The items in this scale reflect a person's level of impulsiveness in purchasing or spending. For each item, please choose the answer that best describes you from the following alternatives: Strongly disagree (1), Disagree (2), Somewhat disagree (3), Neither agree or disagree (4), Somewhat agree (5), Agree (6), Strongly agree (7)

تعكس عبارات هذا المقياس مستوى اندفاع الشخص في الشراء أو الإنفاق. يرجى اختيار أكثر إجابة تنطبق عليك من البدائل التالية: لا أوافق بشدة (1)، لا أوافق (2)، لا أوافق إلى حد ما (3)، محايد (4)، موافق إلى حد ما (5)، موافق (6)، أوافق بشدة (7)

No.	Original items (English)	Translated items (Arabic)
1	My spending habits are creating chaos in my life.	عاداتي في الإنفاق تسبب فوضى في حياتي.
2	I usually spend all of my money left after paying bills each month.	عادةً أنفق كل أموال المتبقية بعد دفع الفواتير كل شهر.
3	I feel like I just have to spend money left after bills are paid.	أشعر أنه يجب أن أنفق كل الأموال المتبقية بعد دفع الفواتير.
4	I feel "high" when I go on a buying spree.	أشعر بالنشوة (بالاستمتاع) عندما أسرف في الشراء.
5	Shopping is fun!	التسوق متعة!

No.	Original items (English)	Translated items (Arabic)
6	I am preoccupied with shopping and spending.	أنا مشغول البال بالتسوق والإنفاق.
7	I cannot resist sales signs in window or shop displays, I just have to check them out.	لا يمكنني مقاومة لافتات المبيعات في المحلات أو شاشات العرض ، لا بد لي من إلقاء نظرة عليها.
8	I go shopping and buy things as often as I can.	أذهب للتسوق وشراء الأشياء كلما استطعت.
9	I go on a buying binge when I'm upset, disappointed, depressed, or angry.	أسرف في الشراء عندما أشعر بالضيق أو الإحباط أو الاكتئاب أو الغضب.
10	I go shopping and buy things to celebrate.	عندما أريد أن احتفل بشيء أذهب للتسوق والشراء.
11	I feel guilty or ashamed after I go on a buying binge.	أشعر بالذنب أو الخزي بعد التسوق والشراء بإسراف.
12	I feel anxious after I go on a buying binge.	أشعر بالقلق بعد التسوق والشراء بإسراف.
13	I hide my spending habits and the things that I buy from family or friends.	أخفي عاداتي في الإنفاق وأخبي الأشياء التي أشتريها عن العائلة أو الأصدقاء.
14	I buy things I don't need or won't use.	أشتري أشياء لا أحتاجها أو لا أستخدمها.
15	I shop and spend even when I don't need anything.	أتسوق وأنفق حتى عندما لا أحتاج إلى أي شيء.
16	Many of the things I buy are never worn or used.	العديد من الأشياء التي أشتريها لم يتم ارتداؤها أو استخدامها أبدًا

Appendix C: Ruminative Responses Scale original and translated items.

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do: almost never (1), sometimes (2), often (3), almost always (4)

يفكر الناس ويفعلون العديد من الأشياء المختلفة عندما يشعرون بالاكتئاب. يرجى قراءة كل عبارة أدناه، وتحديد مدى تكرار حدوثها لديك عندما تشعر بالإحباط أو الحزن أو الاكتئاب. يرجى الإشارة إلى ما تفعله بشكل عام ، وليس ما تعتقد أنه يجب عليك القيام به: أبدا (1)، أحيانا (2)، غالبا (3)، دائما (4)

No.	Original items (English)	Translated items (Arabic)
1	Think “What am I doing to deserve this?”	تفكر في " ماذا فعلت ليحدث لي ذلك ؟"
2	Analyze recent events to try to understand why you are depressed.	تحلل الأحداث الأخيرة لمحاولة فهم سبب اكتئابك(حزنك) .
3	Think “Why do I always react this way?”	تفكر "لماذا أتصرف دائما بهذه الطريقة؟"
4	Go away by yourself and think about why you feel this way.	تختلي بنفسك وتفكر في سبب شعورك بهذه المشاعر.
5	Write down what you are thinking and analyze it.	تكتب ما تفكر فيه وتقوم بتحليله.
6	Think about a recent situation, wishing it had gone better.	تفكر في موقف حديث ، متمنياً لو أن الأمور قد سارت بشكل أفضل.
7	Think “Why do I have problems other people don’t have?”	تفكر "لماذا أعاني من مشاكل لا يعاني منها الآخرون؟"
8	Think “Why can’t I handle things better?”	تفكر "لماذا لا يمكنني التعامل مع الأمور بشكل أفضل؟"
9	Analyze your personality to try to understand why you are depressed.	تحلل شخصيتك لمحاولة فهم سبب إصابتك بالحزن والكآبة.
10	Go someplace alone to think about your feelings.	تذهب إلى مكان ما بمفردك لتفكر في مشاعرك.

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