



## RESEARCH ARTICLE

# Psychometric properties of the pathological buying screener: Reliability and validity study

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### ABSTRACT

**Objective:** The Pathological Buying Screener (PBS) is a self-report scale used to evaluate compulsive buying behavior. The aim of this study was to assess the validity and reliability of a Turkish version of the PBS in a nonclinical sample.

**Method:** A total of 457 adult participants aged 18-64 years were enrolled in this study. Internal consistency, test-retest reliability and structure, concurrent and criterion-related predictive validity analyses were conducted to ensure reliability and validity for use of the scale with a Turkish population. As part of the validity study, all of the participants were asked to complete a battery of self-report scales: the Compulsive Buying Scale, the Brief Symptom Inventory, the Rosenberg Self-Esteem Scale, the Barratt Impulsiveness Scale-Short Form, and the PBS. In order to examine the test-retest reliability, 75 participants were asked to complete the questionnaire once again 2 weeks after the first administration.

**Results:** The results of this study revealed that the PBS had good internal consistency and test-retest reliability. The findings supported concurrent and criterion-related predictive validity, and a 2-factor structure, consistent with the original form.

**Conclusion:** The Turkish version of the PBS is a valid and reliable measurement tool that will add to understanding of pathological buying behavior.

**Keywords:** Pathological buying behavior, pathological buying screener, psychometric properties, reliability, validity

## INTRODUCTION

Pathological buying was first defined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (1) in the category of impulse control disorders not elsewhere classified. There were significant changes in the DSM-5 (2). Obsessive-compulsive disorder was removed from the anxiety disorders category and placed in a new, separate diagnostic chapter of obsessive-compulsive disorder and related disorders. Compulsive buying was itemized

as a marker of hoarding disorder, which is classified in that group of obsessive-compulsive and similar disorders (3). A category of disruptive, impulse-control, and conduct disorders was also created, which collected several disorders related to self-control previously categorized in other chapters. This was important and valuable progress; however, discussion continues about the definitions, relationships, and categorization of several behaviors, including compulsive-impulsive buying, internet use, and more (4). It is still unclear whether pathological buying

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behavior is associated with impulse-control disorder (5), obsessive-compulsive disorder/hoarding disorder (6), or non-substance-related disorders (behavioral addiction) (3).

Despite diagnostic uncertainties, it is generally accepted that purchasing behavior approaches the pathological end of the spectrum when it is characterized by frequent and impulsive activity that causes psychological distress, interferes with the fulfillment of social and other obligations, and results in financial difficulty (7). One of the features that distinguishes normal buying behavior from pathological buying is the consequences of the behavior, rather than the behavior itself. One study of individuals who exhibited pathological buying behavior determined that 58.3% of the participants had incurred large debts as a result of the activity, 45.8% reported a feeling of guilt, 41.7% were unable to make the payments for their purchases, 33% had received criticism from their relatives, and 8% had legal issues (8). Other research has noted that individuals with this behavior experience significant levels of psychological stress, including depression and feelings of guilt, and problems in their relationships with others (9). An early analysis of the overall lifestyle and problems of subjects identified as compulsive shoppers published in 1994 noted the significant debt accrued and that nearly 60% were found to meet criteria for a DSM-III-R personality disorder, most commonly the obsessive-compulsive, borderline, and avoidant types. The authors concluded that compulsive buying was a definable clinical syndrome that caused sufferers significant distress and was associated with significant psychiatric comorbidity (10).

The inability of individuals to control their pathological buying behavior despite adverse effects is a distinguishing factor of pathological buying (11). Persistent, excessive, impulsive, and uncontrollable purchasing becomes compulsive behavior (7). It has been reported that almost all individuals with pathological buying behavior try, but fail, to stop the behavior (9). McElroy et al. (12) observed that 91.7% of individuals with pathological buying behavior attempted to resist the urge by avoiding stores, returning their credit cards to the bank, or walking around stores without buying anything, but in most cases, these attempts failed (12). Another examination of the components of the behavior noted that while urgency, lack of perseverance, and lack of premeditation demonstrated a correlation, only urgency was a significant predictor of compulsive

buying, noting that the act alleviated negative emotions for a short time, despite the potential of bad consequences (13).

Various tools have been developed to assess pathological buying behavior. However, it is worth mentioning here that these tools have some limitations, since this behavior has no approved diagnostic criteria (14). Canadian marketing researchers, Valence et al. (15), developed the first scale to measure and examine pathological buying constructs and negative impacts, which examined relationships between self-esteem, materialism, and compulsive buying. A validation of a Turkish adaptation of this scale was performed by Yuncu and Kesebir (16). A similar tool, the German Addictive Buying Scale, is used in most European studies (17). These scales are generally focused on psychological dimensions, such as the desire and urge to buy, feelings of guilt afterward, and buying products they cannot afford. However, these scales have not sufficiently been able to measure resistance to pathological buying or the severity of pathological buying (5).

The 7-item Compulsive Buying Scale (CBS) was developed in the USA by Faber and O'Guinn (18). This instrument was designed to classify compulsive buyers and evaluates general shopping behavior, including thoughts, feelings, and behaviors before, during, and after making purchases. The primary focus of the scale is financial problems experienced as a result of the behavior and it includes some items specific to North American culture (19). The Edwards Compulsive Buying Scale (ECBS) reduced the cultural sensitivity of the instrument and added items related to self-esteem. It includes 5 factors: tendency to spend, impulsivity, feelings while shopping, post-purchase guilt, and dysfunctions related to spending (20). However, use of the CBS is more common (5).

The Minnesota Impulsive Disorder Interview, developed by Christenson et al. (8), is another instrument that can be used to assess pathological buying. A semi-structured interview is used to evaluate the presence of kleptomania, trichotillomania, pathological gambling, intermittent blast disorder, compulsive sexual behavior, and compulsive exercise, as well as pathological buying. A shopping version of the Yale-Brown Obsessive-Compulsive Scale (21) also assesses thoughts and behaviors related to compulsive buying (22), and the definition of pathological buying by McElroy et al. (12) and Lejoyeux et al. (23) led to the development of the Questionnaire About Buying Behavior, a 19-item scale that measures the impulse to

buy, negative feedback from family and friends, and post-buying guilt.

More recent measurement tools developed within the framework of different areas of research are also noteworthy. Although it was designed in a marketing context, the Richmond CBS also addresses behaviors in terms of obsessive-compulsive spectrum disorder (24). Andreassen et al. (25) developed the Bergen Shopping Addiction Scale in order to include elements of addiction and other components. This scale includes salience, mood modification, tolerance, withdrawal, conflict, relapse, and resulting problems, which are characteristics of substance abuse.

Müller et al. (5) addressed pathological buying behavior in terms of both behavioral addiction and impulse-control disorder based on the literature and clinical observations. The Pathological Buying Screener (PBS) is a scale that consists of items related to emotion regulation, loss of control, preoccupation/desire, buying things that are not needed, hiding purchasing behavior from others, financial problems, effects on other areas of life, efforts to resist the behavior, and the degree of the suffering caused by the behavior. A large sample of the German population, comprising 2403 individuals aged 14-65 years, was used in the development of the scale, and an American English version was concurrently created and verified. A Spanish version has also been validated (26).

The validity of the PBS was tested using some conditions associated with pathological buying behavior cited in the literature. The existing research has identified that participants felt more sad, anxious, and depressed before buying; experienced positive emotions after or while buying something; and subsequently felt a relief of tension and satisfaction (8,11). Individuals displaying pathological buying behavior have also been found to have significant levels of other psychological symptoms (27).

Our study examined pathological buying behavior and its relationship to anxiety and depressive mood. According to some research, the motivation for pathological buying behavior may be in the increased positive self-esteem experienced in the act of purchasing, rather than a need for or expectation of utility of a product (28). Purchasing can be a way to alleviate low self-esteem and cope with intolerable conditions, such as stress, depression, and frustration (23). This association was examined in the validity portion of the present study. The perspective of impulse-control disorder was also applied in order to examine the relationship between pathological buying and impulsivity (19).

Although there are not yet definitive criteria to define pathological buying behavior, a Turkish version of the PBS will be a valuable addition to the literature and very useful to clinicians, particularly as there are currently few tools available in Turkish. It was developed by psychologists and psychiatrists based on symptoms seen in clinical settings, it covers many features of pathological buying, and furthermore, the original was developed using a large sample, and has already been successfully adapted to another language. Additional data related to pathological buying behavior will help advance understanding of pathological buying.

## METHOD

### Participants

A total of 457 individuals, 286 women, 170 men, and 1 other (non-binary) between the ages of 18-64 years ( $33.17 \pm 9.62$  years) were selected for enrollment on a voluntary basis through convenient sampling. All of the participants were reached online. In all, 2% of the participants were primary school graduates, 1.5% were secondary school graduates, 13.1% were high school graduates, 10.7% were associate degree students or graduates, 38.1% were undergraduate students or graduates, 26% were graduate students or graduates, and 8.5% were doctoral students or graduates. In terms of marital status, 47% of the participants were married and 53% were single. The occupational status question revealed that 63.5% were currently employed, 34.6% were unemployed, and 2% were retired. The monthly income of 11.5% of the participants was  $\leq 1000$  TL, 1001-2325 TL for 12.8%, 2326-4000 TL for 22.7%, 4001-5000 TL for 16.6%, and 36.5% earned  $>5000$  TL. Assessment of psychological history indicated that 85.3% of the respondents reported no diagnosed psychological disorder in the immediate family, while 14.7% did; 13.1% of the participants stated that they themselves had a psychiatric diagnosis, while 86.9% stated that they did not. Among the 59 (13.1%) participants who reported a psychological disorder, 19 stated that they had been diagnosed with anxiety disorder, 18 cited depression, 5 reported obsessive-compulsive disorder, 2 noted bipolar disorder, there was 1 case each of an eating disorder and post-traumatic stress disorder, and 13 did not specify a diagnosis.

### Measures

**Personal Information Form:** The researchers prepared a form to collect sociodemographic information

regarding age, gender, education, income, relationship status, marital status, and psychiatric history of the participants and their family members.

**Pathological Buying Screener (PBS):** The PBS was developed by Müller et al. (5) to provide a clinical evaluation of pathological buying behavior. The diagnostic criteria of behavioral addiction and impulse-control disorder were used to create 33 items designed to assess features such as mental preoccupation/severe impulse to buy, loss of control, emotion regulation, not using purchased items/hiding what is bought, lying about expenditures, interference with life/consequences, and resistance to compulsive buying. A total of 20 items were selected following a pre-test study with 119 participants. Factor analysis was used to develop the final version of the scale consisting of 2 subscales: loss of control/consequences (10 items) and excessive buying behavior (3 items) scored using a 5-point Likert-type scale (1: never, 5: very often). The minimum score is 13 and the maximum score is 75. A higher score indicates greater pathological buying behavior. A cutoff point was calculated using 2 standard deviations above the mean, which yielded an initial cutoff value of 29. A second method resulted in a cutoff value of 39. The authors noted that further investigation was needed to refine a cutoff point for use in clinical diagnosis.

Validity and reliability analyses performed to examine the psychometric properties of the scale revealed a Cronbach's alpha value of the total scale of 0.93, while the value for the loss of control/consequences subscale was 0.95 and 0.86 for the excessive buying subscale (5). Exploratory factor analysis (EFA) used to assess the construct validity of the scale determined that items 6, 12, 9, 11, 13, 5, 3, 2, 8, and 1 were loaded onto the loss of control factor, while items 10, 7, and 4 pertained to the excessive buying factor. The correlation of the factors was  $r=0.43$  ( $p<0.001$ ). Finally, analysis of correlations with the CBS revealed a significant and negative correlation ( $r=0.57$ ,  $p<0.001$ ) (5). In contrast to the PBS, a low score on the CBS indicates more symptoms of pathological buying.

**Compulsive Buying Scale (CBS):** The CBS, developed by Valence et al. (15), examines pathological buying behavior using 4 subdimensions: spending tendency, reactive buying, guilt, and family relationships. The internal consistency coefficient of the full scale was found to be 0.88, and that of the subdimensions was 0.78-0.93 (15).

Yuncu and Kesebir (16) performed a validity and reliability study of a Turkish version of the scale. The

CBS is a self-report instrument consisting of 12 items scored using a 5-point Likert-type scale, yielding a lowest possible score of 12 and a highest possible score of 60. The cutoff point of the scale was determined to be 42; a higher score reflects greater compulsive buying behavior. The internal consistency coefficient of the scale was found to be 0.80 (16). In the current data set, the Cronbach's alpha value of the scale was 0.88.

**Rosenberg Self-Esteem Scale (RSE):** The Rosenberg Self-Esteem scale (RSE) consists of 63 items and 12 subdimensions (29). A 4-point Likert type scale is used, and higher scores indicate lower self-esteem. The Turkish translation and psychometric studies of the scale were evaluated in a study of high school students performed by Cuhadaroglu (30). In this data set, the internal consistency coefficient was 0.87. In the present study, only the 10-item self-esteem subdimension was used.

**Brief Symptom Inventory (BSI):** Derogatis (31) developed the BSI by shortening the 90-item Symptom Checklist (SCL-90) used to detect psychiatric symptoms in various conditions to 53 items. Like the SCL-90, the original form of the BSI consists of 9 subscales: Somatization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism, and 3 global discomfort indicator scales: Global severity index, positive symptom distress index, and positive symptom total. Three separate studies returned an internal consistency coefficient of the subscales of 0.71-0.85. Reliability studies determined that the correlation coefficient of the subscales was 0.68-0.91 (31). Respondents use a 5-point Likert-type scale (0: none, 4: a lot) to describe the severity of recent symptoms. Validity and reliability of a Turkish version of the BSI was performed by Sahin and Durak (32). The anxiety and depression subscales of the BSI were used in this study. The Cronbach's alpha values of the Turkish subscales were found to be 0.87 and 0.88, respectively (32). In this study, the internal consistency coefficients were 0.87 for the anxiety subscale and 0.89 for the depression subscale.

**Barratt Impulsiveness Scale-Short Form (BIS-11-SF):** The BIS-11-SF was first developed to evaluate the structure of impulsivity in 1959 and has since been revised many times. The BIS-11, the latest version of the scale, was created in 1995 (33). A shorter, 15-item version of the scale was also created (34). Psychometric studies of a Turkish BIS-11-SF were conducted by Tamam et al. (34). The BIS-11-SF consists of 3 subscales: inability to plan, motor impulsivity, and attention



impulsivity (33). Participants rank their responses using a 4-point Likert type scale (1: never; 4: always). The lowest possible score that can be obtained from the scale is 15, and the highest score is 60. A higher score indicates a higher level of impulsivity. The Cronbach's alpha value of the full scale was 0.82, and the subscale value ranged between 0.64 and 0.80 (34). The Cronbach alpha value of the total scale was calculated to be 0.84 in this study.

### Process

Permission to adapt the PBS to Turkish was obtained from the researchers who developed the original scale (5) and approval for this study was granted by the Istanbul Şehir University Ethics Committee (No: 56/2019). The study participants also provided consent.

Translation-back translation was used to create the initial version of the instrument. The original English version was translated into Turkish by a graduate student of clinical psychology who is proficient in Turkish and English and familiar with psychology terminology. The back-translation of the Turkish form was performed by a professional translator. Two clinical psychologists reviewed both forms in terms of content and meaning, and a final version was created. A pre-test with 25 people was used to assess the intelligibility of the translation prior to implementing the research data collection stage.

Survey administration software was used to upload the form to the internet and conduct the study (Google Forms and Google Docs; Google LLC, Mountain View, CA, USA). Participants were selected using random sampling on various online social media platforms. The reliability measure of the form was performed by 75 respondents who were contacted by email 2 weeks after the first test and retested. The findings were analyzed using Pearson correlation analysis.

IBM SPSS Statistics for Windows, Version 22.0 and AMOS software (IBM Corp., Armonk, NY, USA) were used to analyze the psychometrics of the survey.

## RESULTS

### Pathological Buying Screener Validity Analysis-Construct Validity

Since multivariate normality is required to test the construct validity, the Mahalanobis distance was calculated for the PBS items and 38 multivariate outliers were removed from the data set. The factor analyses were conducted with the results of 419 respondents.

Confirmatory factor analysis (CFA) was performed to test the factor structure. The findings showed that the Turkish version did not have the same factor structure as the original version ( $\chi^2/df$  ratio=7.06, root mean square error of approximation [RMSEA]=0.12, standardized root mean square residual [SRMR]=0.06, adjusted goodness of fit index [AGFI]=0.78, goodness of fit index [GFI]: 0.84, comparative fit index [CFI]=0.89, normed fit index [NFI]=0.87). Exploratory factor analysis (EFA) and CFA were then applied to different datasets: EFA (n=210) and CFA (n=209). A size of n>200 is considered sufficient for EFA and CFA analyses (36).

During EFA, promax (oblique) rotation and major axis factors analysis were used in accordance with the development study of the original scale. The Kaiser-Meyer-Olkin Test and Bartlett's Test of Sphericity were conducted to evaluate the suitability of the data for factor analysis. Both yielded appropriate results: The Kaiser-Meyer-Olkin sampling adequacy measurement was 0.90 and the Bartlett's test finding was ( $\chi^2[78]=1575.0$ ,  $p<0.001$ ). After confirming the suitability of the data for factor analysis, the results of EFA were examined. As a result, 2 factors were determined to have an eigenvalue of >1. The factor structure of the scale was also evaluated by examining a line graph. As a result of a significant break and flattening seen after the second factor, the 2-factor structure suggested by the eigenvalues was supported and retained. The first factor explains 51.14% of the variance and the second factor explains 9.9% of the variance. Thus, the factors explain 61.04% of the total variance.

Examination of the distribution of the items according to the factors and factor loads, indicated that the first factor included items 2, 3, 5, 6, 9, 11, 12, and 13 and the factor load was 0.55-0.83. The second factor included items 1, 4, 7, 8, and 10 with a factor load of 0.45-1.00 (Table 1). Since it is expected that there will be a correlation between factors, the item factor loads may be >1 in factor analyses using promax rotation because the factor loads are regression coefficients (37).

The EFA results indicated that behavioral control issues were most reflected in the first factor items, and the factor was labeled "loss of control and its outcomes," and the second factor was named "obsessive buying" as the items demonstrated obsessive characteristics.

CFA was performed on different datasets to confirm the factor structure obtained with EFA. The GFI indices

**Table 1: Pathological Buying Screener factor structure and loading**

Items	Factor 1	Factor 2
<b>How often does it happen that...</b>		
<b>PBS 1: You can't stop thinking about buying?</b>	0.01	0.71
<b>PBS 2: You feel embarrassed when others ask you about your buying behavior?</b>	0.81	-0.22
<b>PBS 3: You have financial difficulties due to your buying habits?</b>	0.71	0.10
<b>PBS 4: You spend more time buying than you intended?</b>	0.30	0.45
<b>PBS 5: You suffer distress from your buying habits?</b>	0.69	0.16
<b>PBS 6: You have problems at work, school, or in other areas due to your buying behavior?</b>	0.82	0.03
<b>PBS 7: You buy more things than you need</b>	0.16	0.72
<b>PBS 8: At times you don't feel good and that you feel better when you go shopping?</b>	-0.38	1.00
<b>PBS 9: You hide your buying habits from others?</b>	0.80	-0.20
<b>PBS 10: You buy more than you planned?</b>	0.09	0.79
<b>PBS 11: You cannot stop buying things despite financial problems?</b>	0.55	0.32
<b>PBS 12: You try to limit your buying behavior and can't?</b>	0.55	0.34
<b>PBS 13: You have problems with other people due to your buying behavior?</b>	0.83	0.00

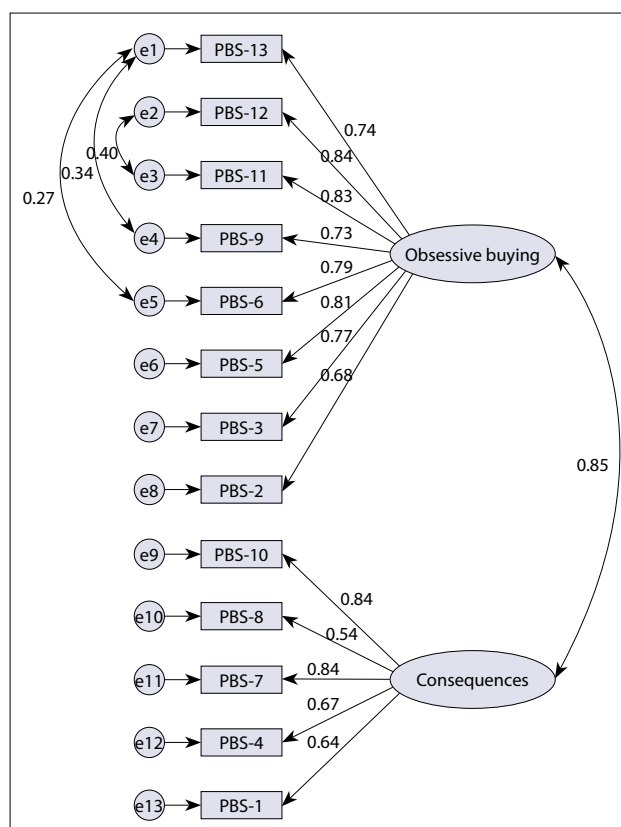
PBS: Pathological Buying Screener

were  $\chi^2/SD$  ratio=2.82, RMSEA=0.09, SRMR=0.05, AGFI=0.83, GFI=0.89, CFI=0.94, NFI=0.91. In terms of fit index findings, although the RMSEA value was a borderline result ( $0.08 < RMSEA < 0.10$ ), the acceptable  $\chi^2/df$  ratio ( $\chi^2/df < 3$ ), SRMR value (SRMR < 0.08), and other values (CFI, NFI > 0.90), the 2-factor structure of the PBS is acceptable (38,39). The item factor coefficients calculated by CFA are presented in Figure 1.

Due to the high correlation value between the 2 factors ( $r=0.85$ ), single-factor analysis and evaluation of a higher-order factor model were deemed necessary. Testing of single-factor analysis as an alternative model yielded a  $\chi^2/SD$  ratio of 5.29, and RMSEA=0.14, SRMR=0.06, AGFI=0.71, GFI=0.80, CFI=0.87, NFI=0.84; single-factor analysis was found to be a poor fit. High-level factor analysis was evaluated revealed a  $\chi^2/SD$  ratio of 4.69, RMSEA=0.13, SRMR=0.06, AGFI=0.72, GFI=0.57, CFI=0.87, NFI=0.84, and it was judged that this analysis showed a poorer fit than the 2-factor analysis. Two-factor analysis was considered the most appropriate.

### Pathological Buying Screener Reliability Analysis – Internal Consistency Analysis

In order to evaluate the internal consistency of the Turkish PBS, the Cronbach's alpha coefficients for the whole scale were examined and the subscales were created according to the factorization structure. The internal consistency of the whole scale was 0.92, and 0.91 and 0.83 for the subscales. The correlation between items was 0.22-0.80 in the whole scale, and the item-



**Figure 1.** Confirmatory factor analysis results: RMSEA=0.09, SRMR=0.05, CFI=0.94.

CFI: Comparative fit index, PBS: Pathological Buying Screener, RMSEA: Root mean square error of approximation, SRMR: Standardized root mean square residual.

total correlations was 0.47-0.79. No item was found that would improve the internal consistency coefficient if

removed from the scale. Inter-item correlation, item-total correlation, internal consistency, and test-retest reliability coefficients for are presented in Table 2.

**Pathological Buying Screener Reliability – Test-Retest**

A retest of the Turkish PBS was performed with 75 respondents 2 weeks after the first administration in order to evaluate the test-retest reliability of the scale. Pearson correlation analysis of the scores obtained from both measurements indicated that the test-retest reliability of the entire scale was 0.79, and 0.75 and 0.76 for the subscales (Table 2).

**Pathological Buying Screener Validity Analysis**

The score distributions obtained from the PBS, CBS, RSE, BSI-anxiety, BSI-depression, and the BIS-11-SF were examined in terms of assumption of normality in the entire data set before performing a validity analysis. In all, 7 outliers with a z-score of >3.30 were removed from the data set and the analyses were conducted using the data of 445 individuals.

**Concurrent Validity**

In order to test the concurrent validity of the Turkish PBS, the relationship of the subscales to the CBS, BIS-

11-SF, and the RSE were examined. Significant and positive results between the PBS and the other scales were observed. The results of Pearson correlation analysis are presented in Table 3.

**Criterion-Related Predictive Validity**

The differences in pathological buying between groups that demonstrated high and low levels of psychological symptoms and compulsive buying behavior were examined using the BSI-anxiety and BSI-depression subscales to evaluate the criterion-related predictive validity of the Turkish PBS. The median split method was applied to the scale scores to form groups with high and low anxiety scores, and high and low depression scores. The same method was used to create groups according to the CBS scores, and the differences were evaluated. The differences in PBS scores for depression (low-high), anxiety (low-high), and compulsive buying behavior (low-high) groups were examined with independent groups t-tests. The Levene test, which examines the homogeneity of the intergroup variance assumption for an independent groups t-test, was applied and it was observed that individuals with a high anxiety level (26.28±9.67) had higher PBS scores than those with a low anxiety level (20.46±8.12)

**Table 2: Inter-item correlations, item-total correlations, and internal consistency of the Pathological Buying Screener and subscales**

Scale	Number of items	Inter-item correlation range	Total item correlation range	Internal consistency (Cronbach α) coefficient	Test-retest reliability (r) (n=75)
<b>PBS</b>	13	0.22-0.80	0.47-0.79	0.92	0.79*
<b>PBS-Loss of control/Consequences</b>	8	0.44-0.80	0.61-0.78	0.91	0.75*
<b>PBS-Obsessive buying</b>	5	0.37-0.76	0.58-0.74	0.83	0.76*

\*p<0.001. PBS: Pathological Buying Screener

**Table 3: Correlation coefficients of the Pathological Buying Screener and its subscales, and other scales and subscales**

Scales	PBS	PBS-Loss of control/Consequences	PBS-Obsessive buying
<b>CBS</b>	0.67*	0.60*	0.70*
<b>CBS-Spending tendency</b>	0.60*	0.51*	0.61*
<b>CBS-Reactive buying</b>	0.57*	0.42*	0.67*
<b>CBS-Feelings of guilt</b>	0.50*	0.50*	0.41*
<b>BIS-11-SF</b>	0.51*	0.49*	0.45*
<b>BIS-11-SF- Inability to plan</b>	0.29*	0.31*	0.22*
<b>BIS-11-SF-Motor impulsivity</b>	0.56*	0.51*	0.53*
<b>BIS-11-SF-Attention impulsivity</b>	0.40*	0.37*	0.37*
<b>RSE</b>	0.24*	0.25*	0.18*

\*p<0.001. BIS-11-SF: Barratt Impulsiveness Scale-Short Form, CBS: Compulsive Buying Scale, PBS: Pathological Buying Screener, RSE: Rosenberg Self-Esteem Scale

( $t[417.19]=6.85, p<0.001$ ). Similarly, individuals with high depression scores ( $26.30\pm 10.00$ ) were found to have higher PBS scores ( $t[399.99]=6.88, p<0.001$ ) than individuals with low depression scores ( $20.44\pm 7.72$ ). Finally, individuals with high compulsive buying behavior ( $28.35\pm 9.39$ ) were also found to have higher PBS scores than individuals with low scores ( $18.75\pm 6.62$ ) ( $t[368.03]=-12.32, p<0.001$ ).

## DISCUSSION

This study was designed to examine the psychometric properties of a Turkish adaptation of the PBS scale. EFA was first applied to evaluate the construct validity of the Turkish form to ascertain if the scale had a factor structure compatible with the original form according to the CFA results. Müller et al. (5) used a 2-factor structure of loss of control/consequences and excessive buying behavior in the original scale. Our analysis indicated that the Turkish form of the scale also had a 2-factor structure. However, there were differences in the Turkish form in terms of the distribution of the items to the factors.

Examination of the factor loads revealed that in the Turkish version, items 1 and 8 were aligned with the second factor, excessive buying behavior, rather than the first factor, loss of control/consequences. The contents of these items, persistent thoughts about shopping and the emotions experienced, were loaded to the second factor of the Turkish PBS, obsessive buying. The CFA findings also yielded acceptable fit indices for this factor analysis. The construct validity findings of the Turkish version of the PBS were slightly weaker than those of the original form (RMSEA=0.08, CFI=0.96, SRMR=0.04) (5), and similar to those of the Spanish version (RMSEA=0.09, CFI=0.90, SRMR=0.07) (26). It was determined that the Turkish version of the PBS also had a 2-factor structure.

The reliability analysis included calculation of the internal consistency coefficient and test-retest correlation. The internal consistency coefficients were 0.92 for the whole scale, and 0.91 and 0.83 for the subscales. The original scale was found to have a coefficient of 0.92 for the entire scale, and 0.95 and 0.86 for the subscales (5). The adaptation to Spanish yielded subscale internal consistency coefficients of 0.92 and 0.86 (26). Comparison of the scale in different languages and applied in different cultures revealed consistent results within the instrument itself and between subscales. In addition, our test-retest correlation finding of 0.79 demonstrated the stability of the tool. The

correlation value between items was between 0.22 and 0.80. An acceptable correlation value is generally  $>0.30$  (37). We observed that the correlation between items 8 and 2 ( $r=0.22$ ), 6 ( $r=0.27$ ), and 9 ( $r=0.24$ ) was  $<0.30$ . Considering that  $\geq 0.50$  is considered appropriate in item-total correlations (40), the item-total correlation of item 8 was also low ( $r=0.47$ ). However, when item 8 was removed, the Cronbach alpha coefficient of the whole scale did not improve, and the Cronbach alpha coefficient of the subscale decreased. The association between item 8 and subscale items, and the total was moderate-high, and all of the items with a low correlation for this question were in different subscales (items 2, 3, and 9).

The congruent validity of the scale was tested using the relationships of the PBS and its subscales and other conditions found to be associated with pathological buying in the literature. Müller et al. (5) also examined the scale's relationship to another measurement tool (CBS) and found a strong correlation between the PBS and the CBS ( $r=-0.57, p<0.001$ ). We examined the relationship to the Turkish CBS, and observed a positive, significant, and strong relationship ( $r=0.67, p<0.001$ ). The difference in the direction of the relationship in these studies is due to the fact that a lower score indicates greater pathological buying behavior in the CBS. A strong and significant association was found between these instruments in both studies.

The relationship between pathological buying and impulsivity was also analyzed due to the difficulty individuals with pathological buying behavior have in controlling the behavior. The analysis revealed a positive and significant relationship between the PBS and the BIS-11-SF, as expected ( $r=0.51, p<0.001$ ). In addition, the relationship was examined using the Turkish adaptation of the CBS. Yuncu and Kesebir (16) also found a significant positive correlation between impulsivity and pathological buying ( $r=0.68, p<0.001$ ). The results show that these individuals have difficulty controlling their buying behavior despite negative outcomes. Based on the view that some individuals with self-esteem problems use pathological buying as a tool to regulate these problems (7), the congruent validity of the PBS was also examined with the RSE. A positive and significant but weak relationship was found between pathological buying and low self-esteem ( $r=0.24, p<0.001$ ). This finding is consistent with the self-esteem and compulsive buying behavior findings seen in the Turkish adaptation of the CBS ( $r=-0.65, p<0.001$ ) (16). The difference in the strength of the relationship in these findings may be related to



the fact that more than half of the sample used in the CBS adaptation study was individuals with psychiatric diagnoses, such as compulsive buying and bipolar disorder (16). In the current study, the proportion of those exhibiting pathological buying behavior was limited to 9.2%. A cutoff score of 39 was used in the original study (5).

Another method used to test the validity of the PBS was to examine the criterion-related validity. Studies in the literature have found that pathological buying was associated with anxiety disorder (8) and depression (41). Accordingly, the anxiety and depression subscales of the BSI were used to assess criterion-related validity. The scores obtained from these scales were separated using the median split method and groups were formed of those with low and high symptom levels. The analysis indicated that individuals with high depression and anxiety scores had higher pathological buying scores than those with low scores. Thus, it appears that the PBS can distinguish between low and high symptom groups in terms of both anxiety and depression. The ability of the PBS score to distinguish between groups was also demonstrated in groups formed according to compulsive buying behavior, which conceptually overlaps with pathological buying behavior. Based on the analyses performed, the Turkish version of the PBS was found to have a good level of validity and reliability.

A Turkish PBS addresses a deficiency in sufficient means to evaluate pathological buying behavior in a Turkish population. While the CBS, which has already been adapted into Turkish, focuses on the feelings of guilt among the outcomes of the behavior (16), the PBS includes reference to negative financial, psychological, and social outcomes (5). Since one of the main features that distinguishes pathological buying behavior from normal buying behavior is the consequences, this additional perspective is valuable. In addition, the fact that the PBS only takes the last 6 months into account while evaluating the behavior removes some uncertainty in the evaluation of pathological buying behavior. The PBS is a more comprehensive tool to evaluate pathological buying.

This evaluation of the psychometrics of the PBS has some limitations, though it offers a good level of validity and reliability. The sample was drawn using the convenient sampling method in the online environment and only individuals using social media platforms participated in the study. Therefore, this may limit the generalizability of the findings. In addition, although the respondents constituted a large and diverse group, generalizability to a clinical sample

group may be limited. Future studies that examine the scale in clinical settings may provide useful findings. Furthermore, the majority of the participants were women; gender distribution was not balanced. The educational status data of the participants also reflects a majority with undergraduate, graduate, and doctoral education. This may have biased the results. Since the data set consisted of self-report scales, a social-desirability bias may have been influenced the results. The number of questions may also have created a fatigue effect on the participants. Finally, it is worth noting that the data were collected between April 20 and June 14, 2020 during the coronavirus 2019 pandemic. Although we do not know precise details of how the situation affected behavior, it may have had various effects. These include potentially reduced shopping behavior as a result of closures and curfews, as well as possible changes to online shopping patterns. Therefore, it may be necessary to re-examine the psychometric properties of the scale and the sociodemographic characteristics of pathological buying behavior with a large sample that can provide representation during a more normal period.

Our research could serve as a start for further investigation of pathological buying behavior. For example, it could be transformed into an epidemiological study with a larger and more balanced sample. Examining the relationship between the subscales of the scale and other variables, such as personality traits, will contribute to the expansion of the literature and our understanding of this subject. Psychotherapy studies would also be valuable.

This study the addition of a valid and reliable scale related to pathological buying to the literature that could contribute to future studies and to clinical practice.

Contribution Categories		Author Initials
Category 1	Concept/Design	G.T.D., C.A., M.A.
	Data acquisition	G.T.D.
	Data analysis/Interpretation	M.A., G.T.D.
Category 2	Drafting manuscript	G.T.D.
	Critical revision of manuscript	C.A., M.A.
Category 3	Final approval and accountability	G.T.D., C.A., M.A.
Other	Technical or material support	N/A
	Supervision	N/A

**Ethics Committee Approval:** This study was granted by the Istanbul Şehir University Ethics Committee (No: 56/2019).

**Informed Consent:** After the procedures were fully explained, an informed consent form was obtained.

**Peer-review:** Externally peer-reviewed.

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