

Examination of the Criterion Validity of the MMPI-2 Depression, Anxiety, and Anger Content Scales

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Abstract

Objective: Examination of the psychometric properties and content areas of the revised MMPI's (MMPI-2 [Minnesota Multiphasic Personality Inventory-2]) content scales is required. In this study the criterion-related validity of the MMPI-2 Depression, Anxiety, and Anger Content scales was examined using the following conceptually relevant scales: The Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and State Triad Anger Scale (STAS).

Method: MMPI-2 Depression, Anxiety, and Anger Content scales, and BDI, BAI, and STAS were administered to a sample of 196 students at Middle East Technical University (n= 196; 122 female, 74 male). Regression analyses were performed to determine if these conceptually relevant scales contributed significantly beyond the content scales. The MMPI-2 Depression Content Scale was compared to BDI, the MMPI-2 Anxiety Scale was compared to BAI, and the MMPI-2 Anger Content Scale was compared to STAS.

Results: The internal consistency of the MMPI-2 Depression Content Scale ($\alpha = 0.82$), the MMPI-2 Anxiety Content Scale ($\alpha = 0.73$), and the MMPI-2 Anger Content Scale ($\alpha = 0.72$) was obtained. Criterion validity of the 3 analyzed content scales was demonstrated for both males and females.

Conclusion: The findings indicated that (1) the MMPI-2 Depression Content Scale provides information about the general level of depression, (2) the MMPI-2 Anxiety Content Scale assesses subjective anxiety rather than somatic anxiety, and (3) the MMPI-2 Anger Content Scale may provide information about the potential to act out. The findings also provide further evidence that the 3 conceptually relevant scales aid in the interpretation of MMPI-2 scores by contributing additional information beyond the clinical scales.

Key Words: MMPI-2, Depression, Anxiety, Anger

INTRODUCTION

MMPI (Minnesota Multiphasic Personality Inventory) is a self-report inventory designed by Hathaway and McKinley (1940) to be part of the routine assessment procedure. The developers set out to measure aspects of personality and social adaptation skills with a single inventory (Erol, 1982). Subsequent clinical implementation supported by interviews and observations verified MMPI's efficiency and reliability as a psycho-diagnostic classification instrument (Graham, 1993). Savaşır (1981) developed the Turkish version of the scale and a study with a large sample of patients conducted by Erol (1982) found that MMPI was an appropriate instrument to differentiate adults experiencing psychiatric difficulties from normal adults in Turkey.

The scoring manual for MMPI was developed based

on an empirical approach (Hathaway and McKinley, 1949). In other words, clinical instruments were administered to normal and clinical samples, and items that best differentiated diagnosed patients (e.g. depression) from non-patients were chosen. The criterion that determined which item belonged to which scale was the differentiating power of the criterion item rather than its content. By implication, standard scales of MMPI have heterogeneous item content. For instance, it's possible to obtain the same raw score by marking different items. Consequently, items marked by patients are frequently evaluated one by one in order to interpret the upward movement in clinical scales. Researchers and clinicians realized the importance of item content for interpreting the profiles as use of MMPI increased. As a result of the systematic analysis of the general item pool and independent clinical scales, sub-item groups, which con-

tributed to the interpretation of MMPI protocols, were developed (Comrey, 1957; Graham et al., 1971). Two different methods were used while developing these item groups (content scales): (1) Factor analysis, which is a statistical method (Haris and Lingo 1955, 1968) and (2) rational assignment of items to content groups by specialists (Wiggins, 1969). The Haris-Lingo MMPI content subscales and Wiggins MMPI content scales for the original MMPI are the 2 that are the most accepted and used (Graham, 1993).

In the revision of MMPI, MMPI-2 was developed to improve and re-standardize the inventory. Throughout the revision process, it was aimed to maintain the integrity of the original scale; however, numerous items had to be re-written or eliminated for the MMPI-2 (Graham, 1993). In this re-organized framework, the adequacy of the content scales was questioned. Consequently, a new content evaluation based on MMPI-2's item pool was needed. MMPI-2 was adapted to Turkish by Savaşır and Çulha (1996), and its test-retest reliability and criterion validity were psychometrically studied by Bozkurt (2001); however, the manual for the Turkish MMPI-2 has yet to be published. MMPI-2 is used for research in Turkey. Demir et al. (2002) studied the pathological nature of alcohol-dependent individuals with MMPI-2. The criterion-related validity, internal reliability, and diagnostic efficiency of MMPI-2's sub-scales, in terms of alcohol and substance dependence, the Mac Andrew Alcoholism (MAC-R), Addiction Potential Scale (APS), and Addiction Admission Scale (AAS) were studied (Demir et al., 2002). Yıldırım et al. (2005) used MMPI-2 to compare personality profiles of bipolar disorder patients to a control group. To the best of our knowledge these are the only studies to have used the Turkish version of the MMPI-2 content scales.

The MMPI-2 content scales were developed to evaluate the content dimension of the inventory, which was revised by Butcher et al. (1990) with a 3-stage development procedure. During the first stage, 22 content classifications were rationally formed and defined in detail; 3 clinical psychologists were asked to assign appropriate items to these MMPI-2 content classifications. The main principal of this stage was the consistency among the assigners. During the second stage, internal reliability, factor structures, and item total correlation scores were examined. Items with low internal reliability values were eliminated and items that correlated strongly with multiple scales were also eliminated. During the last stage, the appropriateness of the items forming the content scales was reconsidered. Items that didn't fit into the scale de-

scription were eliminated, even though they were strongly correlated to the scale total score. At the end of the study, 15 content scales were attained; the content scales, item numbers, and symptoms and traits they predict are presented in Appendix I.

Data obtained from females and males forming the norm group of MMPI-2 were used for converting raw scores to t-scores (Butcher et al., 1990). In this manner, content scales and clinical scales were converted to the same metric system. Thus, content scales could be compared to each other and to clinical scales. Test-retest results indicated that the validity of the content scales was higher than the validity of the clinical scales (Graham, 1993). Validity studies indicated that the MMPI-2 content scales validly measure what they are supposed to (Butcher et al., 1990; Ben-Porath et al., 1991; Schill and Wang, 1990).

MMPI is generally interpreted based on the upward movement in the personality profiles. Profile evaluations supply valuable information. Yet, as there are very limited number of the studies conducted for the content scales, it decreases the efficiency of MMPI. Using the content scales together with profile interpretations potentially aids in the determination of symptom intensity and expression, and in the evaluation of treatment results. Additionally, the contents scales are potentially appropriate for research conducted with normal samples because they are short and easy to complete; however, the criterion validity of the MMPI-2 content scales should be tested. The aim of the present study was to assess the degree to which the MMPI-2 Depression, Anxiety, and Anger Content scales measure the psychiatric pathology they were designed to measure. Therefore, the relationship between the MMPI-2 Depression, Anxiety, and Anger Content Scale scores, and the Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), and State-Trait Anger Scale (STAS) was studied. The present study can contribute to the MMPI-2 content scales' clinical and non-clinical implementation.

METHOD

Participants

The study included 196 (122 female, 74 male) college students (105 sophomores, 91 seniors). The volunteers were aged 19-24 years (mean: 21.06 ± 1.43 years). The participants were administered all the scales during 1 session.

INSTRUMENTS

MMPI-2 Anxiety (ANX) Content Scale: This scale

includes 23 items that assess anxiety and stress, sleep and concentration problems, and difficulties with decision making and everyday life responsibilities (Graham, 1993).

MMPI-2 Depression (DEP) Content Scale: This scale includes 33 items that assess distress, depression, and helplessness, lack of interest, and occupation with thoughts of death and suicide (Graham, 1993).

MMPI-2 Anger (ANG) Content Scale: This scale includes 16 items that assess the occurrence, frequency, and manner of expression of anger and hostility (Graham, 1993).

Beck Depression Inventory (BDI): BDI is a 21-item multiple-choice self-report inventory. Each response is assigned a score ranging from 0 to 3; the highest possible score is 63. BDI was developed to objectively measure the intensity of somatic, emotional, cognitive, and motivational symptoms of depression (Savaşır and Şahin, 1997). The inventory was adapted for use with the Turkish population by Hisli (1998). Its split-half reliability is 0.74 (Hisli, 1989), and correlation between MMPI-Depression clinical scale and BDI was 0.63 in the Turkish population (Hisli, 1988).

Beck Anxiety Inventory (BAI): BAI is a 21-item multiple-choice self-report inventory. Each response is assigned a score ranging from 0 to 3; the highest possible score is 63. BAI was developed to measure the frequency of anxiety symptoms (Savaşır and Şahin, 1997). It was adapted for use in Turkey by Ulusoy (1993). Its test-retest validity value is 0.57 and its internal reliability value is 0.92 for the Turkish population (Savaşır and Şahin, 1997). Factor analysis identified 2 sub-dimensions: subjective anxiety and somatic anxiety.

State-Trait Anger Scale (STAS): STAS is a self-report inventory designed to measure the intensity and expression of anger (Savaşır and Şahin, 1997). It is a 44-item instrument containing 3 following dimensions: 10 items measuring state-anger, 10 items measuring trait anger temperament, and 24 items measuring reaction. Reaction dimension contain 3 subscales called Anger In, Anger Out and Anger Control. So, there are 5 different scores obtained from STAS: State-anger, Trait-anger, Anger In, Anger Out and Anger Control. The present study didn't include the state-anger dimension. It was adapted for use with the Turkish population by Özer (1994) and the internal reliability coefficients of its sub-dimensions range from 0.62 to 0.84 for the Turkish population.

Design and Procedure

The present study aimed to assess the criterion validity of the MMPI-2 DEP, ANX, and ANG Content scales. BDI for the MMPI-2 DEP Content Scale, BAI for the MMPI-2 ANX Content Scale, and STAS for the MMPI-2 ANG Content Scale were used as predictors. The 72 items composing the MMPI-2 content scales and BDI, BAI, and STAS scales were administered to the participants. The 3 MMPI-2 content scales were administered with a single form and the other scales were administered with separate forms. The inventories were self-administered to the volunteers during a single session.

RESULTS

Observational studies indicate gender-related differences for MMPI-2 measurements (Schinka et al., 1998; Barthlow et al., 1999). Consequently, males and females were separately analyzed in the present study. For analysis, raw scores of the MMPI-2 DEP, ANX, and ANG Content scales were used. Mean scores and standard deviation values for the MMPI-2 DEP, ANX, and ANG Content scales, and BDI, BAI, and STAS scales are presented in Table I.

Internal Reliability of MMPI-2 Content Scales

During the first step of the analysis the internal reliability of the MMPI-2, DEP, ANX, and ANG Content scales was assessed. The reliability values of the 33-item MMPI-2 DEP Content Scale were $\alpha = 0.82$ in general, $\alpha = 0.83$ for females, and $\alpha = 0.84$ for males.

The reliability values of the 23-item MMPI-2 ANX Content Scale were $\alpha = 0.73$ in general and $\alpha = 0.73$ for both genders. The "I believe I am no more nervous than most others" (223) and "I hardly ever notice my heart pounding and I am seldom short of breath" (208) items correlated negatively to the MMPI-2 total score. The internal reliability value of the scale rose to $\alpha = 0.77$ when these 2 items were discarded. These items weren't discarded for the integrity of the scale.

The reliability values of the MMPI-2 ANG Content Scale was $\alpha = 0.72$ in general, $\alpha = 0.70$ for females, $\alpha = 0.76$ for males. The 461st item, "It makes me angry to have people rush me", didn't correlate to the scale score and the internal reliability rose to $\alpha = 0.74$ when it was discarded; yet, this item was kept for the integrity of the scale. The internal reliability values of the MMPI-2 Depression, Anxiety, and Anger Content scales indicate that they are appropriate instruments for research and clinical assessment.

Table I. MMPI-2 content scales, and BDI, BAI, STAS mean and standard deviation scores.

	General		Female		Male	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
MMPI-2 DEP	11.09	6.28	11.35	6.29	10.64	6.34
MMPI-2 ANX	10.28	4.30	10.93	4.33	9.23	4.07
MMPI-2 ANG	8.60	3.22	8.74	3.06	8.34	3.49
BDI	13.13	8.27	13.51	7.33	12.57	9.68
BAI	17.50	11.94	18.52	12.30	15.79	11.27
STAS	23.47	5.67	23.98	5.68	22.62	5.62

MMPI-2 DEP: MMPI-2 Depression Content Scale; MMPI-2 ANX: MMPI-2 Anxiety Content Scale; MMPI-2 ANG: MMPI-2 Anger Content Scale; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; STAS: State-Trait Anger Anger Scales.

Criterion Validity

In the present study regression analysis was applied to test the criterion validity of the 3 MMPI-2 content scales. Regression analysis is a frequently preferred method for comparing scales with criterion measurements (Ben-Porath, Butcher, and Graham, 1991; Clark, 1996; Barthlow, Graham, Ben-Porath, and McNulty, 1999; Scheibe et al., 2001). In addition to regression analysis, a correlation table was prepared to demonstrate the relationship between the scales' integrity. Correlation analyses are presented in Table II.

Analysis results indicated a strong positive relationship between BDI and the MMPI-2 DEP Content Scale ($n = 196$, $r = 0.71$, $P < 0.000$), and moderately significant relationships between MMPI-2 ANX and the BAI subjective anxiety sub-dimension ($n = 188$, $r = 0.61$, $P < 0.000$) and between MMPI-2 ANX and the BAI somatic anxiety sub-dimension ($n = 188$, $r = 0.42$, $P < 0.000$). A significant relationship was also found between the MMPI-2 ANG Content Scale and STAS. The MMPI-2 ANG Content Scale had a moderately positive and significant relationship to STAS trait anger temperament ($n = 182$, $r = 0.57$, $P < 0.000$), a moderately positive and significant relationship to the STAS Anger-Out Scale ($n = 182$, $r = 0.63$, $P < 0.000$), and a moderately negative and significant relationship to the STAS Anger-Control Scale ($n = 182$, $r = -0.52$, $P < 0.000$). A significant relationship was not found between the MMPI-2 ANG Content Scale and the STAS Anger-In Scale.

Regression analysis was performed to determine the degree to which criterion measurements could predict MMPI-2 content scale scores. BDI scores significantly predicted MMPI-2 DEP Content Scale score ($n = 196$, $R^2 = 0.486$, $F = 181.6$, $P < 0.000$). The results showed

that BDI explains 48.6% of the total variance related to the MMPI-2 DEP Content Scale. BDI scores significantly predicted MMPI-2 DEP Content Scale scores for both genders (male: $n = 74$, $R^2 = 0.506$, $F = 71.81$, $P < 0.000$; female: $n = 122$, $R^2 = 0.487$, $F = 112.86$, $P < 0.000$). BDI scores explained 48.2% and 49.9% of the total variance in the MMPI-2 DEP Content Scale for females and males, respectively. Linear regression analysis scores for the MMPI-2 DEP Content Scale are presented in Table III.

BAI has 2 sub-dimensions; somatic anxiety, which assesses physical symptoms, and subjective anxiety, which assesses cognitive symptoms. The ability of BAI's anxiety sub-dimensions to predict MMPI-2 ANX Content Scale score was evaluated by hierarchical regression analysis, the results of which are presented in Table IV.

The results indicated that BAI is a significant predictor of MMPI-2 ANX Content Scale score ($n = 188$, $R^2 = 0.375$, $F = 111.40$, $P < 0.0000$). The BAI anxiety sub-dimension explained 37.5% of the total variance of the MMPI-2 ANX Content Scale score. When gender differences were considered, BAI was a better predictor for males than for females (male: $n = 71$, $R^2 = 0.450$, $F = 54.536$, $P < 0.000$; female: $n = 117$, $R^2 = 0.332$, $F = 56.983$, $P < 0.000$). BAI explained 45% of the total variance for males and 33.2% for females. With regard to the standardized regression coefficient (β), the power of the BAI subjective anxiety sub-dimension score to predict MMPI-2 ANX Content Scale score was higher than that of the somatic anxiety sub-dimension score. When t-test scores for the significance of regression coefficients were studied, it was clear that only BAI subjective anxiety could predict MMPI-2 ANX Content Scale score. BAI somatic anxiety did not have significant predictive power. Analysis results were similarly important and sig-

Table II. Correlation analysis values demonstrating the relationship of the scales to each other.

	BDI	Subanx	Somanx	STAS	Anger-In	Anger-Out	Anger Control	MMPI-2 DEP	MMPI-2 ANX
MMPI-2 DEP	0.71*	0.53*	0.38	0.18	0.28*	0.22	-0.21	-	-
MMPI-2 ANX	0.58*	0.61*	0.42*	0.33	0.27	0.21	-0.23	0.62*	-
MMPI-2 ANG	0.34*	0.41	0.34	0.57*	0.21	0.63*	-0.52*	0.28*	0.29*

MMPI-2 DEP: MMPI-2 Depression Content Scale; MMPI-2 ANX: MMPI-2 Anxiety Content Scale; MMPI-2 ANG: MMPI-2 Anger Content Scale; BDI: Beck Depression Inventory; Subanx: Subjective Anxiety; Somanx: Somatic Anxiety; STAS: State-Trait Anger Scale
*P < 0.000

nificant for both genders. Analysis results of t-tests and standardized regression coefficients (β) are presented in Table IV.

STAS was used to test the criterion validity of the MMPI-2 ANG Content Scale. STAS total scores were obtained by adding the 4 sub-scale scores (Trait Anger Temperament, which assesses the anger level, Anger-In and Anger-Out, which assess the style of anger expression, and Anger-Control, which assesses the controllability of anger) (Savaşır and Şahin, 1997). Each dimension's predictive power for the MMPI-2 ANG Content Scale score was assessed by hierarchical regression analysis and the results are presented in Table V.

STAS and all its sub-scales were significant predictors of MMPI-2 ANG Content Scale score ($n = 182$, $R^2 = 0.506$, $F = 71.81$, $P < 0.000$). STAS explained 51.1% of the total variance of MMPI-2 ANG Content Scale score. When gender differences were considered, STAS was a relatively better predictor for males than females (male: $n = 66$, $R^2 = 0.506$, $F = 71.81$, $P < 0.000$; female: $n = 116$, $R^2 = 0.487$, $F = 112.86$, $P < 0.000$). STAS explained 48.7% of the total variance for females and 55.8% of the total variance for males. With regard to the standardized regression coefficient (β), the relative order of importance of the predictor variables for MMPI-2 ANG Content Scale score were Anger-In, Anger-Control, Trait Anger

Temperament, and Anger-Out. When t-test results of the significance of regression results were evaluated, all STAS dimensions STASsignificantly predicted MMPI-2 ANG Content Scale score. Analysis results were similarly important and significant for both genders. Analysis results of t-tests and standardized regression coefficients (β) are presented in Table V.

DISCUSSION

Results of the study support that MMPI-2 DEP, ANX, and ANG Content scales have sufficient internal reliability coefficients ($\alpha > 0.70$) for research and clinical implementation. Internal reliability values of the present study are congruent with the internal reliability values of the original study conducted by Butcher et al. (1990). Congruent values obtained from 2 different samples revealed that the scales might have high cross-cultural validity. Internal reliability values obtained from the 2 studies are presented below.

The criterion validity of the MMPI-2 content scales was also studied in the present study. The results indicated that participants who scored higher on the MMPI-2 DEP Content Scale had more severe symptoms of depression and participants who scored lower had milder symptoms. The results also revealed that BDI had a significant relationship to the MMPI-2 ANX and ANG

Table III. Regression analysis results for the MMPI-2 DEP Content Scale.

Criterion	Predictor	R	R ²	R ² _{adj}	F	SD	P
Female							
MMPI-2 DEP	BDI	0.698	0.487	0.482	112.86	1	0.000
Male							
MMPI-2 DEP	BDI	0.712	0.506	0.499	71.81	1	0.000
General							
MMPI-2 DEP	BDI	0.697	0.486	0.483	181.61	1	0.000

MMPI-2 DEP: MMPI-2 Depression Content Scale.

Table IV. Hierarchical regression analysis results for the MMPI-2 ANX Content Scale.

Variable	B	Standard Error _B	B	T	P	Dual r	Partial r
Female							
Constant	7.441	0.598	-	12.389	0.000		
Subanx	0.368	0.064	0.642	5.737	0.000	0.572	0.436
Somanx	-0.073	0.086	-0.094	-0.844	0.400	0.377	-0.078
R = 0.576	R ² = 0.332	F ₍₁₋₁₁₇₎ = 56.983		P = 0.000			
Male							
Constant	5.286	0.654	-	8.082	0.000		
Subanx	0.522	0.101	0.798	5.150	0.000	0.664	0.530
Somanx	-0.122	0.115	-0.164	-1.056	0.295	0.486	-0.127
R = 0.671	R ² = 0.450	F ₍₁₋₇₁₎ = 54.536		P = 0.000			
General							
Constant	6.557	0.445	-	14.729	0.000		
Subanx	0.413	0.054	0.683	7.701	0.000	0.609	0.490
Somanx	-0.075	0.069	-0.097	-1.097	0.274	0.421	-0.080
R = 0.612	R ² = 0.375	F ₍₁₋₁₈₈₎ = 111.40		P = 0.000			

Subanx: Subjective Anxiety; Somanx: Somatic Anxiety.

Content scales. Considering the high comorbidity rate of depression and anxiety, a moderate and significant relationship between BDI and MMPI-2 ANX Content Scale is acceptable. A significant, but weak relationship between BDI and the MMPI-2 ANG Content Scale was observed. We think that future studies of clinical samples that compare depressive patients with patients experiencing anger management problems will be able to explain the nature of the relationship between depressive mood and the MMPI-2 ANG Content Scale. Results of the present study indicating that the MMPI-2 DEP Content Scale could be a good predictor of depressive mood are congruent with studies conducted with other criterion scales. Butcher et al. (1990) revealed that the MMPI-2 DEP Content Scale correlated to the Wiggins Depression Scale (male: 0.89; female: 0.91) and that the MMPI-2 DEP Clinical Scale correlated to the Wiggins Depression Scale (males: 0.51; females: 0.63). More recent studies indicate that the MMPI-2 DEP Content

Scale is instrumental in differential diagnosis (Ben-Porath et al., 1991).

The results indicated that participants who scored higher on the MMPI-2 ANG Content Scale had higher probabilities of acting-out and experiencing severe anger. Concurrently, high scorers were more prone to experience difficulties with anger management. Analysis results indicated that MMPI-2 didn't predict STAS anger-in score; however, anger-in had a weak, but significant relationship to the MMPI-2 DEP Content Scale score. This result revealed a possible relationship between depression, and anger-in and MMPI-2 scores. A similar relationship between BDI and MMPI-2 ANG Content Scale supports this possibility as well. On the other hand, this supposition should be studied with a psychiatric sample. Previous studies demonstrated that the MMPI-2 ANG Content Scale had a strong relationship to the Wiggins Hostility Scale (males: $r = 0.79$;

	Female (Cronbach's Alpha)			Male (Cronbach's Alpha)		
	Depression	Anxiety	Anger	Depression	Anxiety	Anger
The present study	0.83	0.73	0.70	0.84	0.73	0.76
Butcher et al.'s study	0.86	0.83	0.73	0.85	0.86	0.76

Table V. Hierarchical regression analysis results for the MMPI-2 ANG Content Scale.

Variable	B	Standard Error _B	β	T	p	Dual r	Partial r
Female							
Constant	3.697	2.311	-	1.600	0.112		
Trait-Anger Temp	0.097	0.044	0.180	2.220	0.028	0.507	0.202
Anger-Out	0.260	0.070	0.331	3.725	0.000	0.596	0.327
Anger-In	0.120	0.046	0.177	2.622	0.010	0.097	0.237
Anger Control	-0.202	0.055	-0.314	-3.656	0.000	-0.575	-0.321
R = 0.698	R ² = 0.487	F ₍₁₋₁₁₆₎ = 27.509	P = 0.000				
Male							
Constant	0.142	2.341	-	0.061	0.952		
Trait-Anger Temp	0.164	0.074	0.266	2.218	0.030	0.647	0.263
Anger-Out	0.281	0.076	0.413	3.675	0.000	0.686	0.412
Anger-In	0.080	0.084	0.093	0.968	0.337	0.404	0.118
Anger Control	-0.084	0.060	-0.140	1.411	0.163	-0.458	-0.171
R = 0.747	R ² = 0.558	F ₍₁₋₆₆₎ = 20.809	P = 0.000				
General							
Constant	1.901	1.567	-	1.213	0.227		
Trait-Anger Temp	0.114	0.037	0.202	3.057	0.003	0.562	0.218
Anger-Out	0.284	0.048	0.387	5.893	0.000	0.637	0.395
Anger-In	0.109	0.039	0.147	2.820	0.005	0.212	0.201
Anger Control	-0.143	0.039	-0.230	-3.673	0.000	-0.520	-0.259
R = 0.715	R ² = 0.511	F ₍₁₋₁₈₂₎ = 49.13	P = 0.000				

females: $r = 0.80$) (Butcher et al., 1990). Recent studies conducted with the MMPI-2 content scales indicated that the scales could be direct instruments for measuring external aggressiveness (Kawachi et al., 1996; Schill and Wang, 1990; Strassberg and Russell, 2000) and indirect instruments for measuring a patient's control abilities based on inhibition (Elliott et al., 2000b; Goldstein et al., 2005).

The results of the present study indicated that the MMPI-2 ANX Content Scale had a relationship with both the BAI somatic and subjective anxiety sub-dimensions; however, regression analysis indicated that the scale was more prone to measure subjective anxiety, to a large extent. A study conducted by Butcher et al. (1990) revealed a strong relationship between the MMPI-2 ANX Content Scale and the Welsh Anxiety Scale (females: 0.80; males: 0.84), and a strong relationship between the MMPI-2 ANX Content Scale and the Psychasthenia

Clinical Scale (females: 0.83; males: 0.80). More recent studies revealed that the MMPI-2 DEP and ANX Content scales each had a strong relationship with symptom checklists completed by therapists for outpatients (Barthlow et al. 1999), and with external criteria scores obtained by patient self-reports (Archer et al., 1996) and the self-reports of normal samples (Ben-Porath et al., 1993).

The present study was conducted with a normal sample and this is its most important limitation. In this case it may be difficult to generalize the results to psychiatric patients; however, considering that MMPI-1's norm group was composed mostly of young adult college students (54.66%), studies conducted on normal samples for MMPI-2 may be equally valuable for clinical studies. To deal with this limitation, the present study's results should be supported with further research conducted with psychiatric samples.

Analyses and assessments of the present study were based on raw scores, which is another important limitation. Because the analyses were based on raw scores, scores obtained from different content scales cannot be compared to each other; standard scores are necessary for a comparison. Since the MMPI-2 manual hasn't yet published in Turkey, the present study used raw scores;

therefore, comparison of the content scales to each other can be studied in the future. Moreover, future studies should consider the possible contribution of other MMPI-2 content scales. We predict that these empirical studies will make MMPI-2 a common clinical and research instrument.

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APPENDIX I.
MMPI-2 content scales

Scale	Abbreviation	Item Number	The Definition of Measured Symptom or Characteristic
Anxiety	ANX	23	Some psychological and somatic symptoms of anxiety.
Fear	FRS	23	General proneness to fear and some specific fears.
Obsessiveness	OBS	16	Obsessive-compulsive behaviors and cognitions.
Depression	DEP	33	Some behavioral and cognitive symptoms of depression.
Health Concern	HEA	36	General interest in health and somatic complaints.
Bizarre Mentation	BIZ	23	Psychotic symptomatology.
Anger	ANG	16	Anger and aggressive behavior.
Cynicism	CYN	23	Lack of confidence in people.
Antisocial Practice	ASP	22	Some anti-social behaviors and attitudes.
Type A Behavior	TPA	19	Type-A personality behaviors and attitudes.
Low Self-Esteem	LSE	24	Persistent low self-esteem.
Social Discomfort	SOD	24	Timidity and introversion.
Family Problems	FAM	25	Family conflicts.
Work Interference	WRK	33	Psychological problems affecting work performance.
Negative Treatment Indicators	TRT	26	Beliefs, personality traits, and symptoms that can affect a patients' psychological problems.