

# The Validity and Reliability of the Turkish Version of the Buss-Perry's Aggression Questionnaire in Male Substance Dependent Inpatients

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## ABSTRACT

The validity and reliability of the Turkish version of the Buss-Perry's Aggression Questionnaire in male substance dependent inpatients

**Objective:** Buss-Perry's Aggression Questionnaire (AQ) (Buss and Perry, 1992) is a 29-item questionnaire that assesses four aggression related categories (physical aggression, verbal aggression, anger, and hostility). In the aim of this study, the reliability, validity and factorial analysis of the Turkish translation of the Buss-Perry's AQ was conducted in male substance dependent inpatients.

**Method:** The present study was conducted with an adult sample of 200 consecutively admitted male substance dependent inpatients between May and December 2009 in Bakirkoy Training and Research Hospital for Psychiatry, Neurology and Neurosurgery, AMATEM (Alcohol and Drug Research, Treatment and Education Center) in İstanbul. All inpatients were evaluated with the AQ, the State-Trait Anger Expression Inventory (STAXI), the Barratt Impulsiveness Scale (BIS-II), the Beck Depression Inventory (BDI), and the State-Trait Anxiety Inventory (STAI). Factor analysis was performed for AQ items. Cronbach's alpha was used to assess internal consistency that provides some indication of reliability. Test-retest method was also applied for reliability. Other instruments (STAXI and BIS-II for aggressive, BDI and STAI for affective symptoms) were administered together with the AQ to validate the test (external or concurrent validation).

**Results:** The Turkish version of the scale with 28-item and four factor solution was found to be compatible with the original scale in male substance dependent inpatients. The internal consistency coefficient (Cronbach's) was 0.89 for Factor 1 (Physical Aggression) scale, 0.84 for Factor 2 (Hostility) scale, 0.82 for Factor 3, 0.59 for Factor 4, and 0.93 for AQ total score. Item-subscale correlations ranged between 0.59 and 0.79. For each of the items, the corrected item-total correlation values were between 0.25 and 0.75. Test-retest correlations were 0.80 for Factor 1, 0.77 for Factor 2, 0.78 for Factor 3, 0.54 for Factor 4, and 0.84 for AQ total score. Four subscales and total score of AQ were correlated significantly with total scores and subscales of the STAXI and the BIS-II.

**Conclusion:** Results which were obtained in this study suggests that the Turkish version of the AQ with 28-item and four factor solution could be used as a reliable and valid instrument in substance dependent inpatients. The results also suggest that the four scales of the AQ have moderate to high internal consistencies and are stable over two weeks of testing.

**Key words:** Aggression questionnaire, psychometrics, reliability, substance dependence, validity

## ÖZET

Buss-Perry Agresyon Ölçeği Türkçe versiyonunun yatarak tedavi gören erkek alkol/madde bağımlılarında geçerliliği ve güvenilirliği

**Amaç:** Buss-Perry Agresyon Ölçeği (AO) (Buss ve Perry, 1992), 29 maddeden oluşan ve agresyon ile ilişkili dört kategoriye (Fiziksel Agresyon, Sözel Agresyon, Öfke ve Hostilité) değerlendiren bir ölçektir. Bu çalışmanın amacı doğrultusunda AO'nun Türkçe tercümesinin yatarak tedavi gören erkek alkol/madde bağımlılarında geçerlik, güvenilirlik ve faktöriyel yapısı değerlendirilmiştir.

**Yöntem:** Çalışma kapsamına, Bakırköy Ruh Sağlığı ve Sinir Hastalıkları Eğitim ve Araştırma Hastanesi, AMATEM (Alkol Madde Araştırma Tedavi ve Eğitim Merkezi) İstanbul'da Mayıs 2009 ile Aralık 2009 tarihleri arasında ardışık yatarak tedavi gören 200 erişkin erkek alkol/madde bağımlısı hasta alınmıştır. Hastalara AQ, Sürekli Öfke-Öfke İfade Tarzı Ölçeği (SÖ-ÖİTÖ), Barratt Dürtüsellik Ölçeği (BDÖ), Beck Depresyon Envanteri (BDE) ve Durumsal-Sürekli Kaygı Envanteri (DSKE) uygulanmıştır. AQ maddeleri için faktör analizi yapılmıştır. İç tutarlılığı -ki bir miktar güvenilirliği işaret eder- değerlendirmek için Cronbach alfa kullanıldı. Güvenirlik için test-tekrar test metodu da uygulandı. Bir geçerlik yöntemi olarak, AO, diğer ölçüm araçları (agresif belirtiler için SÖ-ÖİTÖ ve BDÖ, afektif belirtiler için BDE ve DSKE) ile birlikte uygulandı (dış ya da eş zamanlı geçerlik).

**Bulgular:** 28 madde ve 4 faktör çözümlü ölçeğin Türkçe şekli yatarak tedavi gören erkek alkol/madde bağımlılarında orijinal ölçekle uyumlu bulunmuştur. İç tutarlık katsayısı (Cronbach alfa) Faktör 1 "Fiziksel Agresyon" için 0.89, Faktör 2 "Hostilité" için 0.84, Faktör 3 için 0.82, Faktör 4 için 0.59 ve AO toplam puanı için 0.93 idi. Her madde için madde-alt ölçek korelasyon değerleri 0.59 ile 0.79 arasında, düzeltilmiş madde-toplam korelasyon değerleri ise 0.25 ile 0.75 arasındaydı. Test-tekrar test korelasyon değerleri Faktör 1 için 0.80, Faktör 2 için 0.77, Faktör 3 için 0.78, Faktör 4 için 0.54 ve AO toplam puanı için 0.84 olarak bulundu. AO ve 4 alt ölçeği, SÖ-ÖİTÖ ve BDÖ ile onların alt ölçek puanları ile anlamlı korelasyon gösterdi.

**Sonuç:** Bu çalışmada elde edilen bulgular 28 madde ve 4 faktör çözümlü AO'nun Türkçe şeklinin yatarak tedavi gören erkek alkol/madde bağımlılarında geçerli ve güvenilir bir ölçüm aracı olarak kullanılabileceğini göstermektedir. Sonuçlara göre ayrıca, AO'nun 4 alt ölçeği orta ve yüksek düzeyde iç güvenilirlik ile 2 haftalık testte stabilite göstermiştir.

**Anahtar kelimeler:** Agresyon Ölçeği, psikometri, güvenilirlik, madde bağımlılığı, geçerlik

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## INTRODUCTION

Aggression is a multidimensional construct that develops within a complex interaction of biological, psychological, social, and cultural factors (1). While aggressive acts are state phenomena, trait aggressiveness refers to a disposition to behave aggressively across various situations and over repeated occasions (2). Aggression is a potential predictive factor of later criminal activity during adolescence (3) and a psychological topic of particular relevance in forensic and clinical contexts (4). Aggression continues to play a prominent role in clinical disorders, in conjunction with maladjusted and socially inappropriate behavior, in the case of criminal offenders, or even in conflicts at school or in a partnership (5). Also, previous studies explored the associations between trait aggression and suicide (6), particularly among dependent populations such as alcohol dependents (7) and cocaine dependents (8). Nevertheless, to predict if somebody will behave aggressively is not only important for the patient within the institutions himself, but also in some cases, it can be useful for the staff as well (4,9).

The association between substance abuse and aggressiveness is undoubtedly complex, but a series of investigations with first graders revealed that boys who were identified by teachers/peers as more aggressive are more likely to use drugs in the future (10). Early aggressive behavior was found predictive of later substance abuse (11) and conduct disorder symptoms have been observed to begin some years before regular drug use (12). White et al. (13) found that early aggressive behavior leads to an increase in alcohol use, and that alcohol use does not lead to later aggressive behavior. Leonard and Senchak (14) found a significant relationship between heavy alcohol use and premarital aggression. Naturalistic studies have also shown a link between severity of aggression and level of alcohol consumption (15-17). Finally, the trait-aggression level of patients with alcohol dependence was compared with the trait aggression level in a population sample, and a significantly higher level of aggression in the alcoholics was found (18). In conclusion, there is evidence suggesting that aggressive personality traits

may predate addictive behavior.

Self-rated aggression measures remain a popular method to assess trait aggression. To reduce the time, effort, and resources involved in measuring aggression, Buss and Durkee (19) developed a 75-item self-report instrument with false-true format, the Buss-Durkee Hostility Inventory, which has quickly become the gold-standard for the measurement of aggression. The inventory is divided into seven scales across two main dimensions of overt aggression and hostility: Assault, Indirect Aggression, Irritability, Negativism, Resentment, Suspicion, and Verbal Aggression. Subsequent factor analyses revealed similar, but not identical, two-factor structures, named either aggressiveness and hostility (19), overt and covert hostility (20) or expressive and neurotic hostility (21). A meta-analysis of factor analyses (22) confirmed this two-factor structure.

To improve the psychometric properties of this instrument, Buss and Perry (23), more recently developed a 29-item self-report questionnaire, the Aggression Questionnaire (AQ) (23,24), which represents an updated and psychometrically improved version of the Buss-Durkee Hostility Inventory (19). In constructing this questionnaire, Buss and Perry (23) borrowed some items intact from the earlier Hostility Inventory, revised other Buss-Durkee items to improve clarity, and added many new items to generate an initial pool of 52 questions. Four correlated factors emerged—Physical Aggression, Verbal Aggression, Anger, and Hostility—on which a core set of 29 items loaded, and this four-factor structure appeared to replicate across all three samples (25). Thus, they designed the AQ to measure four dispositional subtraits of aggression, which they defined as follows: “Physical and Verbal Aggression (these two corresponding to the former Assault and Verbal Aggression), which involve hurting or harming others, represent the instrumental or motor component of behavior. Anger (made up only of Irritability items because Indirect Aggression items did not replicate), which involves physiological arousal and preparation for aggression, represents the emotional or affective component of behavior. Hostility (based on Resentment and Suspicion items), which consists of

feelings of ill will and injustice, represents the cognitive component of behavior (5,23). Buss and Perry (23) also suggested that “after anger has cooled down”, hostility might be “a cognitive residual of ill will, resentment and perhaps suspicion of others’ motives”.

Further, Williams et al. (26), Morren and Meesters (27) and, Diamond and Magaletta (28) assessed the properties of the AQ in offender samples. Two further proposals for the latent structure of the AQ are proposed in the literature, namely: a) a one-factor model, which assumes that all items load on one first order factor, and b) a second order factor implicated in the initial four-factor model (1). A more recent version of the AQ with an additional scale consisting of indirect aggression is available commercially (24).

As discussed previously, the AQ has been widely used and cited as a self-report measure of aggression. The 29-item AQ has been validated with North American (29-31) as well as British (32), Dutch (33), Swedish (34), Japanese (35), Spanish (36), Italian (37), German (38), Greek (1,39), Chinese (40), and Hungarian (41) populations.

Expression of cognitive and emotional components of aggressiveness might be different in different cultures. This could be an effect attributable to the different social pressure upon individual in different cultures (36). Cultures encouraging the expression of emotions may be different from those which lead to the inhibition of most of them (4). The aim of this study was to determine the validity and reliability of the Buss-Perry’s AQ Turkish version in male substance dependent inpatients.

## METHODS

### Participants

The study was conducted in Bakirköy Training and Research Hospital for Psychiatry, Neurology and Neurosurgery, Alcohol and Drug Research, Treatment and Training Center (AMATEM) in Istanbul between May 2009 and December 2009. AMATEM is a specialized center for substance use disorders with 84 inpatient beds, and accepts patients from all over

Turkey. The ethical committee of the hospital approved the study protocol. Patients’ written informed consent was obtained after the study protocol was thoroughly explained.

One hundred consecutively admitted male alcohol dependent inpatients (without other substance use disorders) and 100 consecutively admitted male drug dependent inpatients (without other substance dependence) participated in the study. Alcohol and drug dependent inpatients were included in the study separately, because the study was conducted at the end of the detoxification processes of alcohol and drug dependent inpatients. In the drug dependent group (n=100); 38 (38.0%) patients were cannabis dependents, 32 (32.0%) were opiate-dependent, 7 (7.0%) were cocaine-dependent, and 23 (23.0%) were inhalant-dependent.

### Translation

The original AQ was independently translated from English into Turkish by two experts in psychiatry. Consensus was reached on a common draft by these experts. This Turkish version was back translated into English by an independent translator.

### Procedure

The final Turkish version of the AQ was applied to 200 substance dependent inpatients. All patients were assessed by using a semi-structured socio-demographic form. The diagnosis of alcohol dependence was based on the clinical examination, a screening interview based on the Structured Clinical Interview for DSM-IV (SCID-I) (42), Turkish version (43), conducted by a trained interviewer (CE). First interviews with the study group were conducted after detoxification periods (i.e. 3-4 weeks after the last day of alcohol or substance use). Second administration was repeated again after 2 weeks to 166 (83.0%) of these patients (76 from alcohol, 90 from drug dependents) in a test-retest procedure to assess the test-retest reliability, because the rest were drop-out from treatment before filling the scale second time.

## Assessment Instruments

### **Buss-Perry's Aggression Questionnaire (AQ):**

Trait aggression was measured by the total score of the AQ and scores of the subscales including Physical Aggression (items 1 to 9), Verbal Aggression (items 10 to 14), Anger (items 15 to 21), and Hostility (items 22 to 29). The AQ comprises 29 items in a 5-point Likert format from 0 (extremely uncharacteristic of me) to 4 (extremely characteristic of me). Evidence for the scale's construct validity is available elsewhere (23). Internal consistency reliability is shown on Table 3.

### **State-Trait Anger Expression Inventory (STAXI):**

The original STAXI provides a self-reported measure of the experience and expression of anger in 44 items (44). Although original version designed to measure anger as a situational emotional response (state) and as a predispositional quality (trait), the Turkish version with 34 items that we used does not include state anger (45). Trait anger assesses the tendency to experience anger (i.e., anger proneness) so that higher scores indicate more frequent and intense anger. Individuals answered on a 4-point Likert scale (score range: 0-136). The STAXI also contains three scales designed to assess three different dimensions of the expression of anger: (a) Anger-In (anger suppression), (b) Anger-Out (aggressive anger expression), and (c) Anger-Control (inability to diminish the occurrence of angry feelings).

**The Barratt Impulsiveness Scale (BIS-11):** The measure of impulsiveness as a personality trait was the Barratt Impulsiveness Scale (BIS-11) (46,47). It includes 3 first order factors; Attentional, Motor, and Non-planning impulsiveness. This is a 30-item self-report questionnaire that has been validated to assess impulsiveness as long term patterns of behavior in various populations, including substance-dependent individuals and violent suicide attempters (47,48). Others have found evidence for the validity of this measure; BIS-11 scores are higher in patients with substance abuse problems (49-51). The Turkish version of BIS-11 was used in the present study (52).

**State-Trait Anxiety Inventory (STAI):** As a measure of state and trait anxieties, the Spielberger's State-Trait Anxiety Inventory (STAI), a 40-item self-report instrument was used (53). Participants indicated their agreement with each item on a Likert scale ranging from 1="not at all" to 4="very much so". The Turkish version of the STAI has been shown to have good reliability and validity (54). The Cronbach's alpha was 0.94 for state anxiety and 0.91 for trait anxiety in the present study.

**Beck Depression Inventory (BDI):** Symptoms and severity of depression were evaluated by using the Beck Depression Inventory (BDI) (55), Turkish version (56). The Cronbach's alpha was 0.90 for BDI in the present study.

## Statistical Analysis

The statistical package SPSS 17.0 for Windows was used for all the analyses. Categorical variables were compared by means of the chi-square statistics. We used Student's t-test to compare the groups on continuous variables. Factor analysis for AQ items was performed (Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization). Correlation analyses (Pearson, bivariate) between the AQ items and their subscales, test-retest, AQ total and subscales of AQ and the STAXI and the BIS-11 were performed. Cronbach's alphas were evaluated for internal consistency. For all statistical analyses, p values were two-tailed and differences were considered significant at  $p < 0.05$ .

## RESULTS

### General Results

A total of 200 consecutive substance dependent male inpatients were included in the statistical analyses. The mean age of the participants was 35.39 (SD=10.54, range=18-64). Sociodemographic variables are shown on Table 1 (Table 1).

**Table 1: Sociodemographic variables of male substance dependent inpatients**

	n=200	%
<b>Marital status</b>		
Married	69	34.5
Divorced, Widowed, Separated	55	27.5
Single	76	38.0
<b>Employment status</b>		
Unemployed	76	36.9
Employed	92	44.7
Part time	17	8.3
Retired	15	7.3
<b>Age (mean±S.D.)</b>	35.39	10.54
<b>Duration of education (mean±S.D.)</b>	9.16	3.68
<b>Age at first substance use (mean±S.D.)</b>	16.90	5.07
<b>Age at regular substance use (mean±S.D.)</b>	21.82	7.66

S.D.: Standard deviation

**Table 2: Factor loadings of the AQ items**

Buss-Perry Aggression Questionnaire	Factor 1	Factor 2	Factor 3	Factor 4
<b>Factor 1 (Physical Aggression) Cronbach's alpha=0.89</b>				
6. There are people who pushed me so far that we came to blows	0.710			
5. If I have to resort to violence to protect my rights, I will	0.710			
2. Given enough provocation, I may hit another person	0.705			
1. Once in a while, I can't control the urge to strike another person	0.617			
4. I get into fights a little more than the average person	0.608		0.435	
3. If somebody hits me, I hit back	0.607			
9. I have become so mad that I have broken things	0.527		0.397	
20. Sometimes I fly off the handle for no good reason	0.504*			
16. When frustrated, I get my irritation show	0.443*		0.415	
8. I have threatened people I know	0.426		0.372	
<b>Factor 2 (Hostility) Cronbach's alpha=0.84</b>				
24. Other people always seem to get the breaks		0.749		
22. I am sometimes eaten up with jealousy		0.700		
23. At times I feel I have gotten a raw deal out of life		0.645		
28. I some times feel that people are laughing at me behind my back		0.645		
26. I know that "friends" talk about me behind my back		0.613		
29. When people are especially nice, I wonder what they want	0.353	0.574		
25. I wonder why sometimes I feel so better about things		0.521	0.457	
27. I am suspicious of overly friendly strangers		0.502		
<b>Factor 3 (includes Anger and Verbal Aggression subscale items) Cronbach's alpha=0.82</b>				
18. I am an even-tempered person <sup>R</sup>			0.774*	
13. I can't help getting into arguments when people disagree with me			0.560*	0.356
17. I some times feel like a powder keg ready to explode	0.358	0.400	0.515*	
21. I have trouble controlling my temper	0.381	0.507	0.511*	
11. I often find myself disagreeing with people			0.497*	
14. My friends say that I'm somewhat argumentative			0.487*	
19. Some of my friends think I'm a hot head			0.455*	
<b>Factor 4 (includes Anger and Verbal Aggression subscale items) Cronbach's alpha=0.59</b>				
15. I flare up quickly but get over it quickly				0.707*
12. When people annoy me, I tell them what I think of them	0.387			0.661*
10. I tell my friends openly when I disagree with them				0.641*
<b>Cronbach's alpha when Factor 3 and Factor 4 items together=0.81</b>				
<b>Aggression Questionnaire (Cronbach's alpha=0.93)</b>				

Notes: The 28 items of the Aggression Questionnaire (AQ) are listed according to the order of magnitude of their loadings obtained on the four factors (Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.). Loadings less than 0.35 are omitted.

R: reverse-scored item.

% of Variance (Eigenvalues): AQ=52.93, Factor 1=36.32 (16.77), Factor 2=6.97 (3.29), Factor 3=5.32 (2.53), Factor 4=4.32 (2.03).

\*According to the original four-factor model (Buss and Perry, 1992;14) items 16 and 20 belongs to Anger (loaded in Factor 1), items 10 to 14 belongs to verbal aggression (loaded in Factor 3 and Factor 4), and 15 to 19 and 21 belongs to anger subscales (loaded in Factor 3 and Factor 4).

## Factor Structure

Item 7, which is one of the two reversed items in AQ, showed low corrected item-total score (lower than 0.15) and test-retest correlations, and was deleted from the questionnaire. Table 2 presents the factor loadings of the AQ items (Table 2). An inspection of the eigenvalue curve reveals a clear 4-factor structure according to the scree-test. On Table 2, the 28 items of the AQ are listed according to the order of magnitude of their loadings obtained on the four factors.

The four factors account for 52.9% of the variance, the contribution of the single factors being 36.3%,

**Table 3: Item-subscale, corrected item-total correlations, and test-retest**

Items and subscales	Item-subscale correlations*	Corrected item-total correlation	Test-retest* N=166
<b>Factor 1 (Physical Aggression)</b>			0.80
6	0.77	0.66	0.63
5	0.78	0.63	0.58
2	0.79	0.68	0.67
1	0.59	0.44	0.46
4	0.78	0.71	0.70
3	0.70	0.57	0.73
9	0.60	0.68	0.63
20	0.75	0.56	0.49
16	0.64	0.68	0.43
8	0.72	0.48	0.54
<b>Factor 2 (Hostility)</b>			0.77
24	0.71	0.48	0.73
22	0.69	0.54	0.64
23	0.65	0.45	0.55
28	0.75	0.58	0.65
26	0.72	0.58	0.56
29	0.65	0.45	0.45
25	0.70	0.65	0.56
27	0.64	0.49	0.42
<b>Factor 3</b>	(F3+F4)**		0.78
18	0.61 (0.52)	0.40	0.49
13	0.68 (0.67)	0.56	0.49
17	0.73 (0.70)	0.70	0.66
21	0.79 (0.73)	0.75	0.67
11	0.66 (0.61)	0.50	0.45
14	0.72 (0.70)	0.58	0.72
19	0.71 (0.69)	0.63	0.58
<b>Factor 4</b>			0.54
15	0.73 (0.56)	0.40	0.52
12	0.79 (0.52)	0.39	0.46
10	0.71 (0.45)	0.25	0.49
<b>Aggression Questionnaire</b>		0.84	

\*p&lt;0.001, \*\*Correlations when Factor 3 and Factor 4 considered together as a single factor

7.0%, 5.3%, and 4.3%. The corresponding eigenvalues were 16.77, 3.29, 2.53, and 2.03.

When taking a closer look at which items load on the separate factors, one may notice that all 9 items (items 1 to 9) of the Physical Aggression scale load together on one single factor (Factor 1). Additional to these items, 16<sup>th</sup> and 20<sup>th</sup> items which originally included in Anger scale loaded in Factor 1. The 8 Hostility items all belong to Factor 2. However, 4 items (items 17, 18, 19, and 21) from Anger scale and 3 items (items 11, 13, and 14) from Verbal Aggression scale have their primary loadings on F3. Similarly, 1 item (item 15) from Anger scale and 2 items (items 10 and 12) from Verbal Aggression scale have their primary loadings on Factor 4. It may therefore be concluded that the four dimensional structure of the AQ was confirmed, although the original assignment of the

items to their subscales could not be reproduced without exception. Nevertheless, since Factor 3 and Factor 4 comprises items of the both Anger and Verbal Aggression scales, we decided to evaluate psychometric properties of Factor 3 and Factor 4, both separately and together as a single factor.

### Item-Subscale and Corrected Item-Total Correlations

Item-subscale correlations ranged between 0.54 and 0.80 (p<0.001) (Table 3). When Factor 3 and Factor 4 were evaluated together, item-subscale (items 10, 11, 12, 13, 14, 15, 17, 18, 19, and 21) correlations ranged between 0.45 and 0.73 (not shown). For each of the items, the corrected item-total correlation values were between 0.30 and 0.77 (p<0.001) (Table 3).

## Reliability and Validity

### Internal Consistency Coefficient

In substance dependents, the internal consistency coefficient (Cronbach's alpha) was 0.89 for Factor 1 (Physical Aggression), 0.84 for Factor 2 (Hostility), 0.82 for Factor 3, 0.59 for Factor 4, and 0.93 for AQ. Cronbach's alphas' are shown on Table 2. Mean scores of subscales and AQ total score and correlations between them are shown on Table 3. Also Cronbach's alphas' of Physical Aggression, Hostility, and AQ from studies of Buss and Perry (23) and Vitoratou et al. (1), are shown on this table to compare with the results of the present study (Table 4).

When Factor 3 and Factor 4 were evaluated together, correlation coefficient was 0.77 with Factor 1, 0.63

with Factor 2, and 0.91 with AQ. Also Cronbach's alpha was 0.81 (not shown).

### Test-Retest Reliability

Test-retest correlations were 0.80 for Factor 1 (Physical Aggression), 0.77 for Factor 2 (Hostility), 0.78 for Factor 3, 0.54 for Factor 4, and 0.84 for AQ total score (Table 3).

When Factor 3 and Factor 4 was evaluated together test-retest value was 0.77 (not shown).

### Concurrent Validity

All four factors (and when Factor 3 and Factor 4 evaluated together) and total score of AQ were correlated significantly in the degree of  $p < 0.001$  with

**Table 4: Correlations between subscales and Aggression Questionnaire (AQ) total score, mean of subscales and AQ total scores, Cronbach's alphas' (internal consistency) of the AQ for substance dependents, the study of Buss and Perry (23) and study of Vitoratou et al., (1)**

	Factor 1 (Physical Aggression)	Factor 2 (Hostility)	Factor 3	Factor 4	AQ
Factor 2 (Hostility)	0.60				
Factor 3	0.77	0.65			
Factor 4	0.43	0.33	0.41		
AQ	0.91	0.83	0.89	0.55	
Mean	25.27±9.05	22.71±7.09	17.94±6.18	10.34±2.90	76.25±21.19
Cronbach's $\alpha$					
Present study	0.89	0.84	0.82	0.59	0.93
Buss and Perry (14)	0.85	0.77	-	-	0.89
Vitoratou et al., (1)*	0.84	0.70	-	-	0.87

\*Drug dependent individuals (n=165)

**Table 5: Correlations between subscales and total score of Buss-Perry's AQ with STAXI and BIS-11 and their subscales**

	Factor 1 (Physical Aggression)	Factor 2 (Hostility)	Factor 3	Factor 4	Factor 3+Factor 4	AQ
<b>STAXI</b>						
Trait Anger	0.69	0.59	0.67	0.37	0.66	0.74
Anger-In	0.47	0.49	0.45	0.12*	0.40	0.51
Anger-Out	0.70	0.55	0.74	0.34	0.71	0.75
Anger-Control	-0.45	-0.39	-0.56	-0.14**	-0.50	-0.50
<b>BIS-11</b>	0.51	0.41	0.49	0.17**	0.45	0.52
Physical aggression	0.42	0.41	0.47	0.14*	0.42	0.47
Verbal aggression	0.47	0.34	0.39	0.23****	0.40	0.46
Anger	0.35	0.28	0.35	0.05*	0.29	0.35
<b>STAI- S</b>	0.25	0.44	0.45	0.19***	0.59	0.37
<b>STAI-T</b>	0.37	0.54	0.51	0.54	0.64	0.50
<b>BDI</b>	0.42	0.50	0.42	0.08*	0.37	0.48

\* $p > 0.05$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ , \*\*\*\* $p = 0.001$ , the rest is  $p < 0.001$ , STAXI: State-Trait Anger Expression Inventory, BIS-11: The Barratt Impulsiveness Scale, STAI: State-Trait Anxiety Inventory, BDI: Beck Depression Inventory

total and subscale scores of the STAXI and the BIS-11, BDI, STAI-S, and STAI-T (Table 4).

### **Discriminating Power for Specific Group's Validity**

Turkish version of Buss-Perry AQ total and subscale (not shown,  $p < 0.001$ ) scores were higher among those with history of suicide attempt ( $n=66$ ,  $86.77 \pm 21.47$ ,  $t=-5.25$ ,  $p < 0.001$ ), among those with history of fights ( $n=61$ ,  $91.93 \pm 20.34$ ,  $t=-7.95$ ,  $p < 0.001$ ) and among those with history of trouble with law ( $n=103$ ,  $83.32 \pm 20.70$ ,  $t=-5.17$ ,  $p < 0.001$ ) than those without these histories ( $n=134$ ,  $71.06 \pm 19.09$ ,  $n=139$ ,  $69.36 \pm 17.63$  and  $n=97$ ,  $68.73 \pm 19.09$  respectively) (not shown).

## **DISCUSSION**

The Aggression Questionnaire (AQ) (23) is a widely used self-reported measure of trait aggression. In the present study, the Turkish version of this questionnaire with 28-item and four factor solution was found to be compatible with the original scale among substance dependent inpatients. The results suggest that each subscales and AQ had an adequate reliability in terms of internal consistency. The item-subscale and the corrected item-total correlation coefficient values were significant at moderate to high degrees and were stable over two weeks of testing. Finding Buss-Perry's AQ and its subscales correlated with related constructs such as anger (measured with STAXI) and impulsivity (measured with BIS-11) showed concurrent validity. The appropriateness of the 4-factor model posited by Buss and Perry (23) was further examined by other studies and was supported (35,38).

A number of researchers have investigated the reliability and validity of this instrument, and the findings generally point in the direction of good psychometric properties with the qualification that the elimination of a few items would improve the instrument (57). Specifically, Harris (30) proposed to omit two items from the Hostility subscale (H6 and H8; items 27 and 29); Meesters et al. (33) further omit one more item (first indicator of the Verbal aggression subscale); in addition,

Bryant and Smith (25) proposed a modified 12-item version of the AQ. The seventh item of the Physical Aggression (7<sup>th</sup> item) and fourth item of the Anger (18<sup>th</sup> item) from the Buss and Perry's AQ items, which are the only negatively worded and the reversed scored items in AQ, were found to have relatively low factor loadings in the Japanese version of the AQ (35). Authors suggested that the results of Japanese version of the AQ may be improved psychometrically if these two reversed scored items were removed from the scale for cross-cultural use (35). Gerevich et al. (41) also suggested excluding the two inverse items from the AQ, because of the low reliability of these items with regard to their hypothesized constructs. Similarly, when evaluating the Turkish version of the scale, the 7<sup>th</sup> item showed low corrected item-total and test-retest correlations and was removed from the questionnaire. It was suggested that responses to affirmatively worded items differ from those to negatively worded items in inventories (58). The difference in responses to those two types of items may be much more remarkable for some cultures. The results, however, might be due to a translation artifact rather than the reflection of cross-cultural differences in the dimensionality of aggression. Thus item, "I can think of no good reason for ever hitting a person" might be difficult to understand when translated to Turkish. In summary, the Turkish version of the scale with 28-item solution was found to be compatible with the original scale.

Several studies on adaptations of the AQ in different languages and cultures (29-41), although being able to confirm the four-factor structure, found some disagreement with the original model of Buss and Perry (23) on an item level and with respect to the interpretation and denomination of the factors (38). In the present sample, Physical Aggression (Factor 1) and Hostility (Factor 2) were consistent with the original questionnaire, whereas Factor 3 and Factor 4 computed from items that were originally from Anger and Verbal Aggression subscales. Thus, although the expected four-dimensional structure of the AQ was confirmed in the present study, the assignment of the items from Anger and Verbal Aggression subscales did not agree with the original scale, which showed considerable

overlap with each other computing Factor 3 and Factor 4. Because a great many of the previous studies on the AQ were conducted with student samples with a preponderance of female participants, or with individuals from a general adult population including both genders, it is difficult to compare the results of our sample with these studies. Although these studies had possible limitation of themselves to generalize the results to a broader population, it is evident, however, that our sample was severely biased, too: patients included in this study were all male and the study group was restricted to a treatment population. Men were found to be more aggressive in PA than women in study of Buss and Perry (23), whereas some cultural differences were found for other subscales when considering gender (36). With respect to the gender effect, the well known results with men having higher Physical Aggression scores were consistently observed in samples of general population (1,38) and drug dependent individuals (1), whereas higher scores in the Anger subscale for female participants observed in general population (38). It is evident that male participants were more likely to score higher in the motor component of aggressive behavior whereas females showed a stronger tendency to express their anger instead (38). Cultures encouraging the expressing of emotions may be different from those which result inhibiting most of them (4). Disinhibiting (59) effect of substances and their relationship with alexithymia (60) should also be taken into consideration when discussing the results. Thus, although the possibility of an inaccurate translation of the item wording cannot be excluded, there might be semantic overlap between statements of verbal dispute (being argumentative, disagreeing openly) or Physical Aggression and an accompanying emotion of anger that might be responsible for this result specific to our sample. Nevertheless, the expression of cognitive and emotional components of aggressiveness might be different in different context (4,36).

Berkowitz's theory (61) proposes that negative affect activates ideas, memories, angry feelings, and expressive-motor reactions. The Turkish version of the AQ was correlated with negative affect, such as

depression, state and trait anxiety, which supports this theory. Based on correlations between AQ scales, Buss and Perry (23) suggested anger was the affective component that bridges the cognitive component of hostility and the instrumental components of verbal and physical aggression. They explained that correlations between anger and aggression made sense because anger often precedes aggression and aggression is more likely to occur when people are angry. In fact, many researchers accept the view that hostile aggression is motivated by anger (62). Others pointed out that although anger may motivate aggression, it often leads to responses other than aggression (63), which may depend on such cognitive factors as attributions and expectations (61). In our sample, it may have resulted in using substances as a mean of coping with anger, since sample population had severe substance dependents enough to seek treatment as an inpatient. Substance use may also cause verbal or physical aggression by the disinhibiting role of the substance (59). Consistent with this in a previous study at lower severity of alcohol use (total AUDIT score <8), the clinical sample showed a substantially higher severity of PA than the control sample, but at higher severity of alcohol use the control sample displayed a higher score of PA compared to the clinical sample (64). Thus, clinical populations in different severity may need different risk management strategies in order to address their needs in rationalistic way.

In creating the AQ, Buss and Perry (23) found that the aggression scales were positively related to measures of impulsiveness, as well as to other measures of aggression (31). Result of present study supported these findings such that AQ showed high correlations with anger (measured with STAXI) and impulsivity (measured with BIS-11) suggesting concurrent validity.

Our findings must be understood in the light of several limitations. First, patients included in this study were all male and the study group was restricted to a treatment population. Therefore it is not possible to generalize the findings to female substance dependent patients and non-treatment groups. A second limitation was that although participants were not assessed during withdrawal, patients might still have some

cognitive problems to evaluate themselves correctly at the time of the interview, since we used self-report instruments. Despite of these limitations, results which were obtained in this study suggests that the Turkish version of the Buss-Perry's AQ 28-item solution could

be used as reliable and valid tool for substance dependent inpatients. Although the results supported the four factor scale, psychometric evaluation showed that Factor 3 and Factor 4 can also be scored together as a single factor.

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Adı Soyadı:

**BUSS-PERRY AGRESYON ÖLÇEĞİ**

KARAKTERİNİZE EN UYGUN OLAN YANITI (X) ŞEKLİNDE İŞARETLEYİNİZ.	HİÇ BENİM ÖZELLİĞİM DEĞİL	ÇOK AZ	BİRAZ	ÇOK	TAMAMEN BENİM ÖZELLİĞİM
1. Arada bir başka bir insana vurma arzumu kontrol edemem.					
2. Yeterince kışkırtılırsam başka bir insana vurabilirim.					
3. Eğer biri bana vurursa, ben de ona vururum.					
4. Birçok insana göre biraz daha fazla kavgalara katılırım.					
5. Haklarımı korumam için şiddete başvurmam gerekirse, başvururum.					
6. Beni o kadar zorlayan insanlar olmuştur ki, kavgaya tutuştuk.					
7. Bir insana vurmak için iyi bir sebep düşünemiyorum.*					
8. Tanıdığım insanları tehdit ettim.					
9. O kadar kızdım ki, bir şeyleri kırdım.					
10. Arkadaşlarımla aynı fikirde olmadığımda onlara açıkça söylerim.					
11. Sıklıkla kendimi insanlarla tartışırken bulurum.					
12. İnsanlar sinirimi bozduklarında onlara haklarında ne düşündüğümü söyleyebilirim.					
13. İnsanlar benimle fikir ayrılığına düştüğünde münakaşaya girmekten kendimi alıkoyamam.					
14. Arkadaşlarım münakaşayı seven biri olduğumu söylerler.					
15. Çabuk parlar fakat çabuk sakinleşirim.					
16. Engellendiğimde kızgınlığımı gösteririm.					
17. Bazen kendimi patlamaya hazır barut fıçısı gibi hissederim.					
18. Ben sakin bir insanım.*					
19. Bazı arkadaşlarım asabi olduğumu düşünüyor.					
20. Bazen hiçbir sebep yokken tepem atar.					
21. Öfkemi kontrol etmekte zorluk çekerim.					
22. Bazen kıskançlık beni yiyip bitirir.					
23. Bazen hayatın bana adaletli davranmadığını hissederim.					
24. Fırsatlar her zaman diğer insanlardan yana gibi.					
25. Bazen niye bu kadar sert olduğumu merak ediyorum.					
26. "Arkadaşların", arkamdan hakkımda konuştuklarını biliyorum.					
27. Fazla dostça davranan yabancılardan şüphelenirim.					
28. Bazen insanların arkamdan bana güldüklerini hissederim.					
29. İnsanlar özellikle nazik davrandıklarında, ne isteyeceklerini merak ederim.					

Açıklama: \* Ters puanlanacak maddeler. Yedi nolu madde ölçekten çıkarılmıştır.