

Psychometric Properties of the Inventory of Interpersonal Problems- Circumplex Scales Short Form: a Reliability and Validity Study

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ABSTRACT

Psychometric properties of the Inventory of Interpersonal Problems Circumplex Scales short form: a reliability and validity study

Objective: Considering the lack of an instrument in Turkish to measure individuals' interpersonal difficulties, our aim was to adapt a short version of the Inventory of Interpersonal Problems Circumplex Scales (IIP-C) for Turkish culture, and we studied the psychometric properties of the scale.

Method: Our study included 1298 adult participants from the normal population (411 females and 887 males) between the ages of 18 and 68. In order to establish reliability and validity of the Turkish version of the IIP-C, internal consistency, test-retest reliability, split-half reliability coefficients, and concurrent and criterion validity studies were conducted. The validity study analyzed correlations with the Positive and Negative Affect Schedule, the Brief Symptom Inventory, the Multidimensional Scale of Perceived Social Support and the Basic Personality Traits Inventory.

Results: The results of the study indicated good internal consistency, test-retest and split-half reliability coefficients of the IIP-C, assessing overall level of interpersonal difficulty and distress due to various interpersonal problems. Moreover, findings supported concurrent and criterion validity of the inventory, in addition to the two-factor structures consistent with the original inventory.

Conclusion: The psychometric properties of IIP-C seem to be acceptable; therefore, the instrument can be utilized for research and clinical purposes in Turkey.

Keywords: Interpersonal, inventory of interpersonal problems, reliability, validity



ÖZET

Kişilerarası Problemler Envanteri Döngüsel Ölçekleri kısa formu psikometrik özellikleri: Bir güvenilirlik ve geçerlik çalışması

Amaç: Bu çalışmada bireylerin kişilerarası güçlüklerini ölçen Türkçe bir envanterin bulunmaması göz önüne alınarak Kişilerarası Problemler Envanteri Döngüsel Ölçekleri kısa formunun (IIP-C) Türk kültürüne uyarlanması amaçlanmıştır ve ölçeğin psikometrik özellikleri çalışılmıştır.

Yöntem: Araştırmaya, genel toplumdaki yaşları 18 ile 68 arasında değişmekte 441 erkek, 887'si kadın, toplam 1298 kişi katılmıştır. IIP-C Türkçe formunun güvenilirlik ve geçerlik çalışması kapsamında, iç tutarlılığı, test-tekrar-test güvenilirliği, iki-yarım-test güvenilirliği ile eşzamanlı ve kriter geçerliği incelenmiştir. Geçerlik çalışması kapsamında, Pozitif ve Negatif Duygu Ölçeği, Kısa Semptom Envanteri, Çok Boyutlu Algılanan Sosyal Destek Ölçeği ve Temel Kişilik Özellikleri Envanteri ile ilişkiler incelenmiştir.

Bulgular: Elde edilen sonuçlara göre, genel kişilerarası güçlük düzeyi ve çeşitli kişilerarası problemlerden kaynaklanan stresi değerlendiren Kişilerarası Problemler Envanteri'nin iyi düzeyde iç tutarlılık, test-tekrar-test ve iki-yarım-test güvenilirlik katsayılarına sahip olduğu bulunmuş, benzer şekilde eş zamanlı ve kriter geçerliği ve orijinali ile uyumlu iki faktörlü yapısı da desteklenmiştir.

Sonuç: IIP-C kabul edilir psikometrik özelliklere sahip olup, Türkiye'de yürütülen araştırma ve klinik uygulamalarda kullanılabilir niteliktedir.

Ahtar kelimeler: Kişilerarası, kişilerarası problemler envanteri, güvenilirlik, geçerlik

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INTRODUCTION

According to the Interpersonal Theory of Personality, experiences in interpersonal interaction represent the basic elements of psychopathology. Sullivan (1) suggested that personality can be defined as an interpersonal behavioral pattern reiterated in social life. According to him, basic motivation arises in interpersonal interaction, affecting people's mutual behaviors, out of a need for security and self-esteem. Leary (2) developed Sullivan's interpersonal concept further, explaining interpersonal behavior on a circular plane generated by the coordinates of relational "affiliation" and "dominance", which correspond to Sullivan's "security" and "self-esteem", respectively (3). Figure 1 shows the dimensions and categories of the interpersonal circumplex.

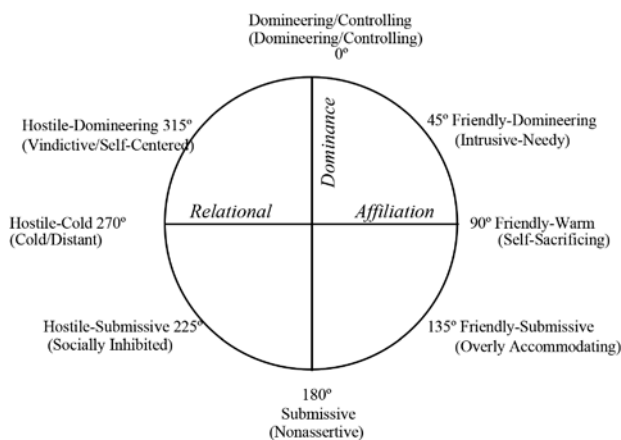


Figure 1: Interpersonal Circumplex Model (3,23)

Note: On the vertical and horizontal axis, relational "affiliation" and "dominance" dimensions are specified, while on the circumference of the plane 45° octants define the interpersonal behavior types emerging from the combination of these dimensions. In brackets, the corresponding IIP-C subscales for each octant are specified.

As seen in Figure 1, interpersonal behaviors show variability in the "relational affiliation" dimension between hostile-cold and friendly-warm behavior, while in the "dominance" dimension, behaviors vary between domineering-controlling and submissive behaviors. Interpersonal behaviors can be explained as combinations of these two dimensions (3). This model,

called Interpersonal Circumplex Model (2), alongside the Inventory of Interpersonal Problems, pioneered a number of interpersonal assessment instruments evaluating the interpersonal dimensions of personality (4). However, none of the available circumplex scales has been adapted for Turkish culture so far. Reviewing the Turkish literature, we find that the Interpersonal Relationship Scale (5), the Interpersonal Style Inventory (6), the Scale of Dimensions of Interpersonal Relationships (7), the Interpersonal Problem Solving Inventory (8), and the Interpersonal Schema Questionnaire (9) have been developed within Turkish culture for the assessment of interpersonal structures. In addition, the Interpersonal Relationship Style Scale (10), the Interpersonal Competence Questionnaire-Short Form (11), and the Interpersonal Dependency Inventory (12) have been adapted to Turkish.

Over the last years, the most frequently used instrument in studies addressing interpersonal behavior in the international literature was the Inventory of Interpersonal Problems-Circumplex (IIP-C). This scale was developed by Alden et al. (13) in order to assess interpersonal functionality in the context of individual distress and difficulties. From a pool of 127 items describing the interpersonal complaints of individuals applied to psychotherapy (14), 64 items were selected to compose the IIP-C (13). Consistent with the Interpersonal Theory, the circumplex structure of IIP explains interpersonal behavior along the two axes relational "affiliation-nurturance" and "dominance-control". Alden et al. (13) divided the Interpersonal Circumplex space by combining these two basic axes to create 8 octants, defining 8 different interpersonal problem areas. These octants, labeled "domineering/controlling", "intrusive-need", "self-sacrificing", "overly accommodating", "nonassertive", "socially avoidant", "cold-distant", and "vindictive/self-centered", representing the subscales of the Inventory of Interpersonal Problems.

The IIP-C, for which various forms have been developed (15) and adapted for a number of languages, is frequently used in the international literature to study clinical and normal samples. It has been validated for German, Danish, Norwegian, Italian, Finnish,

Spanish, Polish, and Swedish (16). Numerous studies have used IIP-C to analyze interpersonal problems in relation to attachment (17,18), personality (19-21), personality disorders (22,23), and mood, anxiety and eating disorders (24-28). Horowitz et al. (2) have pointed out that in the clinical field, IIP-C can be used to determine the intensity and frequency of various types of interpersonal issues, to diagnose common interpersonal problems, to differentiate distress due to interpersonal problems and problems that are not interpersonal, as well as throughout the process of psychotherapy. Over the last years, studies have found that the types of the interpersonal problems are functional in predicting and monitoring the therapeutic alliance, development and outcomes (18,29-33).

Aim of the present study is to make the brief version of the IIP-C, widely used in scientific and clinical studies, available for use in Turkish. In the international literature, there are a number of instruments assessing the interpersonal dimensions of personality within the framework of a circumplex model, none of which has been adapted Turkish. The Inventory of Interpersonal Problems is the most frequently used circumplex scale, functional for researchers as well as clinicians, having been validated in more than eight languages with the development of numerous forms. It is thus evident how important it is to validate this instrument for use in Turkish culture. Validity studies conducted the scales used in original psychometric studies of the original instrument, it is to expect that IIP-C will reveal positive correlations with psychological symptoms and negative affect and negative correlations with perceived social support and positive affect. In regard to basic personality traits, it is expected to find a positive correlation between the overall level of interpersonal problems and neuroticism, and negative valence. To support the construct validity of the inventory, it is further expected that the factors of "affiliation" and "dominance" are extracted and correlations are given to support a correspondance between these factors and "agreeableness" and "extraversion", respectively. Finally, in the context of criterion validity, IIP-C should be able to distinguish between groups showing high and low levels of psychological symptoms.

METHOD

Prior to the data collection phase, necessary permission from the Middle East Technical University Human Research Ethics Committee and written informed consent form from all participants were taken. The study group consisted of 1298 volunteers (411 male, 887 female) with an age range of 18 to 68 years (mean age=26.85 years; SD=7.95 years). As to their educational status, 0.9% had completed primary or middle school, 35.7% high school, 63.4% had a university degree or a postgraduate degree. By marital status, 80.2% were single, 15.3% married, and 4.6% divorced or separated. After removing multivariate outliers from the data set, statistical analyses were performed with 1288 subjects. Cases with more than 10.0% missing values in at least one of the scales used in the study were removed from the relevant analysis.

Inventory of Interpersonal Problems Circumplex Scales (IIP-C):

The IIP-C assesses various problem areas in interpersonal functionality with a five-point Likert-type scale. It consists of a total of 32 items in 8 subscales containing 4 items each. This inventory is the short form of an inventory initially developed with 64 items, modified while retaining the structure of the original scale (3). The subscales of IIP-C, which assesses the overall level of interpersonal problems and distress with its total score, have been named "domineering/controlling", "intrusive-need", "self-sacrificing", "overly accommodating", "nonassertive", "socially avoidant", "cold-distant", and "vindictive/self-centered". High scores for the total scale and for its subscales indicate an increased level of interpersonal distress and specific interpersonal problems. The internal consistency coefficient (Cronbach's Alpha) and test-retest reliability for the original inventory are given as 0.93 and 0.78, respectively. Internal consistencies for subscales range between 0.68 and 0.87. Validity studies have examined the correlation between subscales of the 64-item long version of the inventory and other instruments assessing the level of psychological symptoms and general functionality. Correlations of IIP-64 subscales

with Beck Anxiety Inventory and Beck Depression Inventory varied between 0.31 and 0.48; correlations with the Brief Symptom Inventory ranged from 0.57 to 0.78; with the Symptom Checklist, correlations were between 0.03 and 0.40 (cited in 3). The items of the inventory were translated to Turkish by 3 clinical psychologists who are fluent in both English and Turkish, and the content of the back-translation was consistent with the original items.

Basic Personality Traits Inventory (BPTI): The BPTI was developed by Gencoz and Oncul (34) within Turkish culture with the same method as the original. Consistent with the original study, the newly developed scale extracted 5 basic personality factors corresponding to the 5-factor Personality Model (35), namely “openness to experience”, “conscientiousness”, “extraversion”, “agreeableness”, and “neuroticism” (emotional inconsistency). In the Turkish instrument, a 6th factor was obtained, which was called “negative valence”, corresponding to a negative self-attributions. An examination of the BPTI’s psychometric characteristics showed internal consistency values between 0.71 and 0.89 and a test-retest reliability between 0.71 and 0.84. The validity analysis found correlations of “extraversion”, “conscientiousness”, “agreeableness”, and “openness” with positive affect of 0.47, 0.37, 0.38, and 0.60, respectively, while “extraversion”, “agreeableness”, “emotional inconsistency”, and “negative valence” correlated with negative affect with values of -0.37, 0.59, -0.35, and 0.35, respectively, and the correlations of “openness to experience”, “conscientiousness”, “extraversion”, “agreeableness”, “emotional inconsistency”, and “negative valence” with Rosenberg’s Self-esteem Scale were 0.60, 0.37, 0.42, 0.38, -0.36 ve -0.38, respectively (34).

Brief Symptom Inventory (BSI): Derogatis developed the BSI as a short version of the Symptom Checklist (cited in 36). Adaptation of the instrument in Turkish was carried out by Sahin and Durak (37). Three separate studies evaluating the psychometric characteristics have resulted in internal consistency coefficients for the entire scale between 0.95 and 0.96,

and for the subscales, they found internal consistency coefficients ranging from 0.55 to 0.86. Correlations of the subscales and three global index scores with the Social Comparison Scale were between 0.14 and -0.34, with the Submissive Behavior Scale between 0.16 and 0.42, with the UCLA Loneliness Scale between 0.34 and -0.57, and with the Beck Depression Inventory between 0.34 and 0.70. In addition to the total score of the scale, the present study is grounded on subscales of anxiety, depression, negative self-esteem, somatization, and hostility constituted through Sahin and Durak’s factor analysis.

Positive and Negative Affect Schedule (PANAS): The original PANAS, developed by Watson, Clark and Tellegen (38), is a scale consisting of 20 items: 10 about positive affect and 10 about negative affect. A study for the validation in Turkish was done by Gencoz (39), finding an internal consistency coefficient for positive and negative affect of 0.83 and 0.86, respectively, and a test-retest reliability of 0.40 for positive affect and 0.54 for negative affect. Validity studies found correlations with the Beck Depression Inventory of -0.48 and 0.51 for positive and negative affect sand with the Beck Anxiety Inventory correlations of -0.22 and 0.47, respectively.

Multidimensional Scale of Perceived Social Support (MSPSS): MSPSS (40) is an instrument consisting of 12 items, assessing the adequacy of perceived social support. The scale was adapted to Turkish by Eker and Akar (41), evaluating psychometric characteristics in psychiatric and surgical patients and a group of healthy individuals (patient relatives) (cited in 41). The factor structure of the scale was found to be consistent with the original version, internal consistency in 3 different Turkish samples ranged from 0.80 to 0.95.

Procedure

Before proceeding to collect data, permission was obtained from the Middle Eastern Technical University’s Applied Ethics Research Center and from the original authors of the IIP-C for its use for research purposes.

The scales were administered to the voluntary participants through snowball technique, manually, by e-mail or via an internet site. The participants completed IIP-C, BPTI, BSI, PANAS, and MSPSS in varying sequence. An informed consent form, including purpose of the study, data confidentiality, and researchers' contact information, was given to the participants, depending on their way of participation, either manually or on the entrance page of the website. To collect data on the internet and provide feedback to the participants, a website was built. During data collection, mean values and standard deviation for the data from the first 300 participants who had completed the scale as handouts were calculated and the results shared with subsequent participants in the personal feedback on the website. According to the system setup, participants on the website received automatic feedback that allowed them to compare their IIP-C and BPTI scores with the average values from the 300-participant sample. The feedback provided included explanations of the scale and subscales and a presentation with a graph showing the participant's and the sample's scores. Thus participants could compare their own results with those from the sample. In this way, the participants received personalized feedback in return for sharing their personal information, and at the same time, interest and participation to the present research were aimed to be increased.

Within 3-4 weeks interval the Inventory of Interpersonal Problems was readministered to 89

participants in order to assess the test-retest reliability. These participants were from among the 300 who had completed the form manually and therefore had not received feedback.

RESULTS

Reliability Analysis

As Table 1 shows, the total IIP-C internal consistency coefficient is 0.86. Item-total test correlations vary between 0.16 and 0.59; Cronbach's alpha coefficients for the subscales range from 0.66 to 0.86. In the analysis of the item-total correlation coefficients for the whole scale, 3 items (17, 21, and 32) revealed a coefficient below 0.20. However, the correlation coefficients for these items with their respective subscales were between 0.40 and 0.61. In addition, a removal of these items did not change Cronbach's alpha for the entire scale, while Cronbach's alpha coefficient for the subscales would have decreased after removing items 17 and 21 (0.05 and 0.13, resp.) and only slightly increased (0.02) when removing item 32. Apart from these reasons, another reason why we chose to keep these items is the importance of achieving consistency in crosscultural comparison.

The test-retest reliability coefficient was 0.78 ($p < 0.001$, $n = 89$) for the total IIP-C, while values for subscales varied between 0.67 and 0.85 (for both

Table 1: Item-total test correlations, internal consistency, and test-retest reliability for the total scale and subscales of IIP-C

Scale (n=1288)	Number of Items	Range of Item Total Correlation	Internal Consistency Coefficient (Cronbach's α)	Test-Retest Reliability (r) (n=89)
IIP-C Total Scale	32	0.16- 0.59	0.86	0.78*
IIP-C Domineering/Controlling	4	0.45- 0.51	0.69	0.83*
IIP-C Vindictive/Self-centered	4	0.49- 0.66	0.75	0.67*
IIP-C Cold-Distant	4	0.47- 0.63	0.73	0.68*
IIP-C Socially Avoidant	4	0.55- 0.74	0.84	0.74*
IIP-C Nonassertive	4	0.45- 0.50	0.70	0.71*
IIP-C Overly Accommodating	4	0.39- 0.47	0.66	0.69*
IIP-C Self-Sacrificing	4	0.40- 0.59	0.75	0.74*
IIP-C Intrusive-Needy	4	0.32- 0.66	0.71	0.85*

* $p < 0.001$, IIP-C: Inventory of Interpersonal Problems-Circumplex

values $p < 0.001$, $n = 89$). Table 1 shows the item-total test correlation range, internal consistency, and test-retest reliability for the entire scale and the subscales of the Inventory of Interpersonal Problems (IIP-C).

Split-half reliability was worked out dividing IIP-C randomly into two parts. Guttman split-half test found a reliability of 0.90, while for either of the halves, containing 16 items each, internal consistency coefficients of 0.74 and 0.73 were found.

Validity Analyses

The concurrent validity of IIP-C was analyzed examining the correlations with BSI, PANAS, MSPSS, and BPTI. Table 2 shows all correlations, the coefficients of 0.30 and above were primarily taken into account in interpretations.

As seen in Table 2, correlations of the IIP-C total scale score with basic personality traits is 0.38 for

extraversion, 0.39 for neuroticism, and 0.39 for negative valence ($p < 0.001$ for all, $n = 1009$), with BSI total score 0.52 ($p < 0.001$, $n = 988$), with MSPSS total score 0.32 ($p < 0.001$, $n = 1003$), and with negative affect 0.45 ($p < 0.001$, $n = 1002$). Correlations between IIP-C subscales and BPTI subscales vary between 0.64 and 0.41. For psychological symptoms, correlation between IIP-C total score and BSI total score is 0.52 ($p < 0.001$, $n = 988$), while the subscale correlations range from 0.15 to 0.73 (all $p < 0.001$, $n = 988$). For social support and positive and negative affect, the correlation between IIP-C total score and MSPSS total score is 0.32 ($p < 0.001$, $n = 1003$), and from the PANAS subscales for positive affect 0.22 and negative affect 0.45 (both $p < 0.001$, $n = 1002$) (Table 2).

To evaluate the scale's criterion validity, differences between groups showing high and low psychological symptoms were analyzed regarding interpersonal problems. For this purpose, using the total scores from

Table 2: Correlation of IIP-C Scales with BPTI, BSI, MSPSS, and PANAS

	IIP-C Domineering/ Controlling	IIP-C Vindictive/Self- centered	IIP-C Cold-Distant	IIP-C Socially Avoidant	IIP-C Nonassertive	IIP-C Overly Accommodating	IIP-C Self-Sacrificing	IIP-C Intrusive-Needy	IIP-C Total Scale
BPTI (n=1009)									
Extraversion	0.03 (0.30*)	-0.22* (0.01)	-0.35* (-0.18*)	-0.64* (-0.55*)	-0.43* (-0.30*)	-0.29* (-0.09*)	0.02 (0.26*)	0.13* (0.39*)	-0.38*
Agreeableness	-0.21* (-0.11*)	-0.43* (-0.36*)	-0.40* (-0.37*)	-0.29* (-0.24*)	-0.15* (-0.05)	0.05 (0.22*)	0.41* (0.57*)	0.11* (0.25)	-0.19*
Neuroticism	0.51*	0.25*	0.26*	0.16*	0.22*	0.08	0.09	0.26*	0.39*
Negative Valence	0.38*	0.40*	0.29*	0.22*	0.25*	0.17*	-0.06*	0.18*	0.39*
Openness to experience	0.13*	-0.15*	-0.20*	-0.43*	-0.42*	-0.29*	0.04	0.02	-0.29*
Conscientiousness	-0.14*	-0.15*	-0.19*	-0.18*	-0.22*	-0.22*	0.01	-0.18*	-0.27*
BSI Total Scale (n=988)									
Somatization	0.35*	0.23*	0.35*	0.29*	0.37*	0.33*	0.24*	0.27*	0.52*
Somatization	0.28*	0.15*	0.25*	0.16*	0.24*	0.22*	0.20*	0.19*	0.37*
Negative Self-Image	0.33*	0.25*	0.35*	0.32*	0.40*	0.35*	0.24*	0.27*	0.54*
Depression	0.26*	0.20*	0.32*	0.29*	0.35*	0.34*	0.24*	0.48*	0.73*
Anxiety	0.32*	0.22*	0.33*	0.30*	0.36*	0.30*	0.21*	0.25*	0.49*
Hostility	0.45*	0.24*	0.32*	0.19*	0.27*	0.20*	0.15*	0.25*	0.44*
MSPSS (n=1003)									
Positive Emotion	-0.15*	-0.26*	-0.39*	-0.34*	-0.24*	-0.16*	0.03	0.03	-0.32*
PANAS (n=1002)									
Positive Emotion	0.09	-0.14	-0.20*	-0.31*	-0.30*	-0.21*	0.04	-0.01	-0.22*
Negative Emotion	0.31*	0.18*	0.30*	0.26*	0.35*	0.25*	0.20*	0.24*	0.45*

* $p < 0.001$

IIP-C: Inventory of Interpersonal Problems-Circumplex, BPTI: Basic Personality Traits Inventory, BSI: Brief Symptom Inventory, MSPSS: Multidimensional Scale of Perceived Social Support, PANAS: Positive and Negative Affect Schedule.

Note: IIP-C correlation coefficients obtained using ipsatized data are shown in brackets. Ipsatized data are given for personality and interpersonal problem dimensions that in the literature evaluating the structure validity of IIP-C have been found to overlap.

BSI, the 50% of the participants reaching the highest scores were assigned to the “high psychological symptom” group, the 50% with the lowest scores to the “low psychological symptom” group. After excluding cases with more than 10% missing values, the high psychological symptom group consisted of 486 persons with scores between 48 and 174 (mean=87.90, SD=29.21), the low psychological symptom group included 502 persons with scores between 0 and 47 (mean=27.44, SD=13.57). In order to establish if there was a difference in the 8 IIP-C subscale scores between high and low psychopathology groups, 2 (group: psychological symptom level) x 6 (interpersonal problem scales) Multifactorial Analysis

of Variance (MANOVA) was performed. As a result of this analysis, the main effect of the psychological symptoms was found to be significant (Multivariate $F [8,979]=30.27, p<0.001$; Wilks' Lambda=0.80, $\eta^2=0.20$).

Following multivariate analysis, Univariate Analyses with Bonferonni Correction were performed. In these analyses, alpha coefficients below 0.006 (0.05/8) were considered significant. As a result of these analyses, the main effect of psychological symptoms was found to be significant for all scales. According to the mean values, participants with a high level of psychological symptoms experienced more problems in all interpersonal areas compared with participants with a low level of psychological symptoms.

Table 3: Item Factor Loadings for Inventory of Interpersonal Problems-Circumplex

IIP-C Items	Affiliation	Dominance
1. It is hard for me to say “no” to other people	-0.49	0.25
2. It is hard for me to join in on groups	0.23	0.55
3. It is hard for me to keep things private from other people	-0.29	-0.14
4. It is hard for me to tell a person to stop bothering me	-0.30	0.36
5. It is hard for me to introduce myself to new people	0.26	0.61
6. It is hard for me to confront people with problems that come up	0.04	0.29
7. It is hard for me to be assertive with another person	0.21	0.60
8. It is hard for me to let other people know when I am angry	-0.18	0.47
9. It is hard for me to socialize with other people	0.32	0.57
10. It is hard for me to show affection to people	0.54	0.13
11. It is hard for me to get along with people.	0.46	0.05
12. It is hard for me to be firm when I need to be	-0.18	0.23
13. It is hard for me to experience a feeling of love for another person	0.37	-0.03
14. It is hard for me to be supportive of another person's goals in life	0.47	-0.03
15. It is hard for me to feel close to other people	0.56	0.11
16. It is hard for me to really care about other people's problems	0.59	-0.11
17. It is hard for me to put somebody else's needs before my own	0.60	-0.26
18. It is hard for me to feel good about another person's happiness	0.50	-0.15
19. It is hard for me to ask other people to get together socially with me	0.32	0.37
20. It is hard for me to be assertive without worrying about hurting other person's feelings	-0.19	0.42
21. I open up to people too much	-0.40	0.50
22. I am too aggressive toward other people	0.23	-0.43
23. I try to please other people too much	-0.68	-0.13
24. I want to be noticed too much	-0.16	-0.48
25. I try to control other people too much	0.01	-0.60
26. I put other people's needs before my own too much	-0.67	0.05
27. I am overly generous to other people	-0.56	-0.15
28. I manipulate other people too much to get what I want	0.19	-0.54
29. I tell personal things to other people too much	-0.44	-0.43
30. I argue with other people too much	0.14	-0.48
31. I let other people take advantage of me too much	-0.51	-0.03
32. I am affected by another person's misery too much	-0.46	-0.04
Explained Variance	12.96%	16.15%
Cronbach's Alpha	0.78	0.73

IIP-C: Inventory of Interpersonal Problems-Circumplex, Note: Loadings of factors related to the location of the items are shown in bold face.

To assess IIP-C's structural validity, raw data were converted into ipsatized data and Principal Component Factor Analysis with Varimax Rotation carried out. In order to obtain the bipolar dimensions predicted by the interpersonal circumplex model through factor analysis, it is necessary to remove the effect of the general distress factor shared by all subscales by converting raw data into ipsatized data (13,42). Ipsatized data, frequently used in the literature, are obtained by extracting each individual's mean value for the total scale from the same individual's scores for each item. Results of factor analysis applied to ipsatized data showed, consistent with the original structure of the scale, an 8-factor structure with an eigenvalue above 1. At the same time, Scree Plot examination revealed that the first change was observed in the second factor, therefore the analysis was repeated with 2-factor solution. This analysis was found to account for 29.11% of the variance. Assessing the factor distribution and loadings of the items, it was seen that both factors, supporting the inventory's bipolar factor structure, included items carrying opposite loadings (Table 3). In addition, it was found that 3 items (number 3, 6, and 12) had a loading below 0.30, while 3 items (4, 19, and 29) had cross-loadings on both factors. Nevertheless, in order to enable intercultural comparisons in future studies with IIP-C, it was decided to preserve the item and factor structure as in the original instrument. Under which factor these items have been accepted will be explained in the discussion section.

In addition to the factor analyses applied to the items, as in the study by Horowitz et al. (2), Principal Component Factor Analysis with Varimax Rotation was performed with the subscales' total scores. Similar to the results of the factor analysis for the items, it was shown that the inventory consists of two factors with eigenvalues and explained variance of 2.54 (31.71%) and 2.19 (27.38%), respectively, while the total explained variance was found to be 59.09%. According to the results, the first factor included the "dominance" and "nonassertive" subscales, while the second factor included "self-sacrificing" and "cold-distant" subscales. Thus the circumplex scale's 2-factor structure, with the axes relational "affiliation" and "dominance", has been

Table 4: Factor loadings of the Inventory of Interpersonal Problems-Circumplex Scales

IIP-C-Circumplex Scales	Affiliation	Dominance
Domineering/Controlling		-0.79
Vindictive/Self-centered	0.74	
Cold/Distant	0.76	
Socially Avoidant	0.41	0.57
Nonassertive		0.73
Overly Accommodating	-0.57	0.58
Self-Sacrificing	-0.79	
Intrusive-Needy	-0.52	-0.58
Explained variance (%)	31.71	27.38

Note: Values below 0.40 are not shown.

confirmed. These subscales, being in the same factor while carrying loadings in opposite direction, support the bipolar structure of the factors in the Interpersonal Circumplex. In addition, the factor distributions and loadings of the other subscales, developed by a combination of "dominance" and "affiliation" factors, support the circumplex model (Table 4).

DISCUSSION

The original study on IIP-C was performed in the USA with 800 participants (2), while the current study with 1288 participants assessed the psychometric characteristics of the instrument. Comparing the reliability analyses carried out in these studies, the Turkish form of IIP-C revealed similar Cronbach's alpha values. According to the results, the internal consistency for the total IIP-C scale, with an alpha value above 0.80, was found to be highly acceptable, while the IIP-C subscale values were between 0.66 and 0.84, which is in a range of sufficient to good reliability. The split-half test reliability was also of a highly acceptable level. Test-retest reliability for the original instrument was tested with a 1-week interval, whereas Turkish version was tested with 3-week interval. Test-retest correlation coefficients obtained in the original study and those from the Turkish sample were similar and acceptable, showing stability of the interpersonal problems. Assessing the item-total correlation coefficient, it was seen that the item "It is hard for me to put somebody else's needs before my own" in the vindictive/

self-centered subscale, the item “I open up to people too much” in the intrusive-needy subscale, and the item “I am affected by another person’s misery too much” in the self-sacrificing subscale showed a low correlation with the total scale. This situation may stem from the fact that, in contrast with western societies’ emphasis on individuality and independence, in Turkish culture, which is preserving a traditional structure, problems in this field are seen as less of a “problem”. At the same time, given that the consistency of these items with their respective subscales was high and their removal did not improve the reliability of the total scale while reducing the reliability of the subscales, and considering relevant factors such as the importance of consistency in future intercultural comparisons, it was decided to keep said items in the scale.

In the context of the validity analyses for the inventory, concurrent and criterion validity were examined. For the concurrent validity, IIP-C total score and subscale scores were compared with BSI, PANAS, MSPSS, and BPTI scores, and all correlations were found to be significant in the expected direction. Evaluating the correlation between IIP-C and BPTI scales and considering the strength of the relation, it was found that the strongest correlates of the overall interpersonal problem level were extraversion, neuroticism, and negative valence. On the other hand, with the exception of conscientiousness, all personality traits revealed strong correlations with particular interpersonal problem types. These results are consistent with the literature (20,42,43).

An unexpected finding in the analysis of correlations with IIP-C subscales was that, although conceptually they are related instruments, no significant correlation was found between the IIP-C subscale “overly accommodating” and the BPTI subscale “agreeableness”. The IIP-C subscale “overly accommodating” is a combination of the “submissive” and “friendly-warm” poles of the interpersonal axes. The correlations of BPTI’s “agreeableness” scale with the IIP-C scales “nonassertive” and “self-sacrificing”, which are located in these poles of interpersonal axes, are in the opposite direction (Figure 1). Bringing positively and negatively related dimensions together leads to a mutual

neutralization of their roles. Thus it is assumed that this situation resulted in a non-significant correlation between the IIP-C scale “overly accommodating”, which conceptually carries characteristics of both poles (submissive and friendly-warm), and the BPTI “agreeableness” scale. In a similar situation, no significant correlation was observed between the IIP-C scale “domineering/controlling” and the BPTI scale “extraversion”.

In order to eliminate the above-mentioned disadvantage, we addressed correlations not only with the raw data, which had high inter-subscale correlations, but also with the ipsatized data, which emphasized the bipolar factor structure of the circumplex model. Using ipsatized data, significant positive correlations consistent with the expectations were found between the BPTI “agreeableness” scale and the IIP-C’s “overly accommodating” scale as well as between the BPTI “extraversion” scale and the IIP-C scale “domineering/controlling” (Table 2). Similar results had been obtained in another study, comparing correlations between the personality factors “agreeableness” and “extraversion” and the interpersonal problem octants, using ipsatized scores as well as raw data scores (42). As a result, positive correlations were found between subscales at the positive pole of the “affiliation” dimension and “agreeableness” and negative ones for subscales at the negative pole. These results are consistent with earlier research findings showing an overlap between the “affiliation” dimension and “agreeableness” (43). Regarding the correlation between the interpersonal “dominance” dimension and personality traits, positive correlations were found between the subscales at the positive (upper) pole of the “dominance” dimension and “neuroticism” and “negative valence”, whereas there were negative correlations between the subscales at the negative (lower) pole and “extraversion” and “openness to experience”. Consistent with the expectations, the highest correlation was found between “extraversion” and the “dominance” factor. The correlation of the “dominance” dimension with “extraversion” supports the view of some personality theorists suggesting an alternative positioning of the axes. According to their view, the extraversion factor

from the “Big Five” Personality Model corresponds to the Interpersonal Circumplex Model’s “dominance” dimension rotated clockwise by 45° (“intrusive/needy”-“socially avoidant” vector) (44). In sum, correlational data for the basic personality traits and the interpersonal problem octants support not only the concurrent validity of IIP-C, but also its construct validity. Comparing the IIP-C scores to the BSI scores, a high correlation (0.52) was found between the overall interpersonal problem level and the level of psychological symptoms, while all subscale correlations were significant and positive varying between 0.15 and 0.73. These results are consistent with the original validity studies (3,45). Finally, as expected, interpersonal problems were found to be negatively correlated with perceived social support and positive affect and positively related with negative affect.

While concurrent validity studies revealed significant results in the direction consistent with expectations and previous studies, the correlation coefficients were lower than expected. As stated in the original study (3), it may be thought that interpersonal problems, while correlated with basic personality traits, psychological symptoms, perceived social support, and positive and negative affect, might not have a high predictive value. Regarding IIP-C’s criterion validity, it has been shown that all circumplex scales assessing various interpersonal problem types can differentiate two groups of participants showing high and low psychological symptoms.

Studying the factor structure of IIP-C, in order to bring out the predicted bipolar factor structure of the circumplex interpersonal model it is recommended to convert the raw data into ipsatized data (13,43). The literature reporting that it is not possible to obtain the bipolar dimension supporting the circumplex structure through raw data suggests this to be the result of a general stress factor shared by all subscales in analyses made with raw data (14,47). This general stress factor results in high correlations between the subscales and makes all loadings in the factor analysis positive. Thus Tracey et al. (48) and Vittengl et al. (49) argue in their 3-factor analysis studies that in addition to “dominance” and “love” (which they use as a synonym for

“affiliation”), there is another, 3rd factor called “interpersonal stress”. The aim of the use of ipsatized scores is to eliminate this general distress factor, and to assess the prominence of specific interpersonal problem types in relation to others for the individual (e.g., for a particular person, “dominance” can be a more prominent problem than being “cold-distant”). With this method, the effect of the individual’s overall level of interpersonal distress (also known as “general complaint factor”) on specific interpersonal problems was controlled. (13,43,50).

The result of the principal component analysis supports a bipolar 2-factor structure of the scale, composed of the bipolar factors “dominance” and “affiliation” (Table 3). The bipolar 2-factor structure of the inventory is also supported by the fact that items with opposite loading, particularly items located at the poles of these “dominance” and “affiliation” dimensions (factors), were appeared under the same factor. On the other hand, among the items with cross-loadings, two of them (numbers 19 and 29) are items of the subscales “socially avoidant” and “intrusive-needy”. These subscales are developed with the combination of the octants which are located at the pole of “dominance” and “affiliation” dimension of the circumplex. As these items conceptually carry characteristics of both dimensions, it is possible for them to have cross-loadings. These items have been assessed according to their content, and item 19 (“It is hard for me to ask other people to get together socially with me”) has been evaluated under the “dominance” factor, item 29 (“I tell personal things to other people too much”) under the factor “affiliation”. Another item with cross-loadings, number 4, belongs to the subscale “nonassertive” at the negative pole of the “dominance” dimension and has been accepted under that factor. Finally, though in three items (numbers 3, 6, and 12) a factor loading below 0.30 was found, none of them was eliminated to preserve the factor structure and consistency in crosscultural comparisons. However, it is remarkable that items 4, 6, and 12 belong to the “nonassertive” subscale, which has a correlation with the “overly accommodating” subscale of 0.66. In the light of these data, it can be said that the “nonassertive”

subscale is not well distinguished from the subscale “overly accommodating”, which is located next to it in the circumplex model. This may originate from the fact that Turkish society, in keeping with traditional values, perceives submissive interpersonal behavior pattern as being similar to “friendly agreeableness”. Consistent with the factor structure of the items, the factor structure of the subscales also supported a bipolar 2-dimensional circumplex model. The “nonassertive” subscale was appeared under the “dominance” factor, with an opposite and high loading compared to the “domineering/controlling” subscale (Table 4). This finding also emphasizes the importance of preserving the “nonassertive” subscale in the inventory.

Finally, the bipolar 2- factor structure, and the hypothesized correlations between interpersonal problem patterns and personality, psychological symptoms, positive and negative affect and perceived social support which are consistent with previous findings, is supported by our study results in the context of IIP-C validation. In line with our findings, considering their effects on psychological well-being, it is important to focus on interpersonal problems throughout the psychotherapy process. Moreover, interpersonal problems can affect psychotherapy process and outcomes. In the light of this information, it is important that the present study introduces an instrument with satisfactory validity and reliability properties to be used in future research and clinical applications on interpersonal attitudes and behaviors in Turkey.

As a strength of this study, the broad and diverse sample of participants increased the representability of the normal population. It is also thought that giving

individual feedback to the participants at the end of the research reduced potential bias originating from self-report data collection method and increased the likelihood for participants to give honest and accurate answers, thus improving the validity of the data. As intended, this procedure raised people’s interest in the research, allowing us to reach a large number of participants in a short period of time. The most important limitation of this study is unbalanced distribution of men and women with an extended age range (18-68) in the sample, with a heterogeneous distribution for marital status, resulting in a majority of young single participants (more than half were under the age of 25 years and 80% were single). For future research, it is considered important to examine the psychometric properties of IIP-C also in a clinical sample and to analyze cause-effect relationships of interpersonal problems with the variables presented in this study.

Contribution Categories	Name of Author
Development of study idea	M.A., T.G.
Methodological design of the study	M.A., T.G.
Data acquisition and process	M.A.
Data analysis and interpretation	M.A., T.G.
Literature review	M.A.
Manuscript writing	M.A., T.G.
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