

# Psychometric Evaluation of the Implicit Positive and Negative Affect Test in Turkish Samples



Mehmet PEKER<sup>1</sup>, Gülgün MEŞE<sup>2</sup>, Nevra CEM ERSOY<sup>3</sup>

## SUMMARY

**Objective:** Implicit affect is a concept distinct from explicit affect as it describes the affect processed by the individual at a preconscious level. The aim of this research is to evaluate the psychometric properties of the Turkish form of the Implicit Positive and Negative Affect Test (IPANAT-TR), originally developed by Quirin et al. (2009a) to measure affect indirectly.

**Method:** The study data comprised of psychology and sociology students from Ege University, and full-time and part-time employees from public and private organizations in İzmir. A pilot study was carried out with a group of 57 undergraduate students in order to select the artificial words to be used in the scale. Subsequently the scale was sent to a total of 938 participants, comprising 569 students and 369 employees. Test-retest reliability was assessed with 46 participants after a one-week interval and with 55 participants after a four-week interval.

**Results:** The principal components analysis showed a clear two-factor structure for the IPANAT-TR. The internal consistency scores were 0.92 for Implicit Positive Affect (IPA) and 0.85 for Implicit Negative Affect (INA). The one-week and four-week test retest reliability estimates varied between 0.51 and 0.75. The construct validity assessments showed that the expected relationships between the IPANAT-TR and tested constructs were mostly confirmed. The results of measurement invariance analysis showed that the IPANAT-TR has full measurement invariance across employee and student samples.

**Conclusion:** The results of the reliability, validity and measurement invariance analyses carried out in the current study demonstrated that the IPANAT-TR is a reliable and valid measurement instrument to assess implicit affect.

**Keywords:** The Implicit Positive and Negative Affect Test, reliability, validity

## INTRODUCTION

Emotion and affect measurements have an important role in personality evaluations and research. Therefore, many different self-report scales for assessment of affect have been developed (e.g., Watson and Walker 1996). Although these measures are mostly valid and reliable, self-report measurements of affect are vulnerable to the confounding influences of impression management and other participant characteristics (Robinson and Clore 2002). In addition, some individuals may not be able to accurately evaluate their affective experiences (e.g., Quirin and Bode 2014). Based on these considerations, Quirin et al. (2009a) developed IPANAT to measure affect levels of individuals indirectly.

The IPANAT aims to measure cognitive representations of affective experiences processed at pre-conscious level (Quirin et al. 2009a). Drawing on the dual process approach of attitudes, Quirin et al. (2009a) argued that affect processing can be distinguished as explicit and implicit. Explicit affect is deliberate and processed in sequential-analytical mode at conscious level. Implicit affect, on the other hand, is automatic, and assumed to operate at a parallel-holistic mode at preconscious level. The IPANAT aims to measure implicit affect and it is argued that self-report measurements may be insufficient to measure affect for two reasons. Firstly, affect representations might be influenced by the episodic memory and cognitive representations of affect-related experiences. Secondly, affect assessments relying on self-reports may be

**Received:** 06.08.2018, **Accepted:** 22.05.2019, **Available Online Date:** 10.10.2019

<sup>1</sup>Research Assist., Ege University, Department of Psychology, <sup>2</sup>Ph.D. Assoc. Prof., Ege University, Department of Psychology, <sup>3</sup>Ph.D. Assist. Prof., İzmir University of Economics, Department of Psychology, İzmir, Turkey.

**e-mail:** [mehmet.peker@ege.edu.tr](mailto:mehmet.peker@ege.edu.tr)

influenced by motivational factors such as social desirability and impression management (Quirin et al. 2009a). Unlike the self-report measurements of affect, the IPANAT measures affective experiences indirectly. Participants were presented allegedly artificial words with no actual meaning and asked to evaluate these in terms of six emotion adjectives. Participants were told that these words were taken from an artificial language. For example, it is asked to what extent the word “*FILNU*” reflects the adjectives such as happy, tense, cheerful and helpless. Quirin et al. (2009a) argued that such an indirect measurement will not be affected by potential cognitive and motivational factors. The measurement error might only be present due to the subjective relationship that participants might perceive in relation to the meaningless word. Because the words are meaningless, they will be evaluated in relation to the affective representations in the pre-conceptual level. For example, unless a participant evaluating the word “*FILNU*” has a subjective experience or memory of happiness related to the word, the word will be evaluated on the basis of the participant’s implicit affect.

Several studies showed that the IPANAT is related to various physiological indices. For instance, Quirin et al. (2009b) found that, unlike explicit negative affect, INA was significantly related to the cortisol response to acute stress and IPA was significantly related to the circadian cortisol release. Mossink et al. (2015) found a negative correlation between IPA and the total circadian release of cortisol. INA was also found to be related to higher systolic blood pressure and total peripheral resistance (Van der Ploeg et al. 2016).

The IPANAT has also been used with clinical samples. In their study, Dekker and Johnson (2018) examined the relationship between depression and affect related impulsivity among patients diagnosed with major depressive disorder and utilized the IPANAT to test the effectiveness of procedures which induce negative affect. Remmers et al. (2018) examined effectiveness of mindfulness intervention among acute depressive episode patients. Findings of this study showed that patients who received this intervention reported greater similarity in their explicit affects and the IPANAT measures. Another study found that patients diagnosed with borderline personality disorder reported significantly lower IPA compared to a healthy control group. However, the INA ratings of two groups were not significantly different (Dukalski et al. 2017).

The current study aims to examine psychometric properties of the IPANAT, which offers a viable alternative to explicit affect measures. To this end, the psychometric properties of the IPANAT-TR will be assessed by testing whether or not

the scale has the same factor structure as original version, and satisfactory internal consistency and the test-retest values.

In addition to these tests, construct validity of the IPANAT-TR will be examined. According to implicit affect approach, although explicit and implicit measures focus on different affectivity structures, there may be some degree of overlap because preconscious affect representations can be experienced at conscious level under certain conditions (Quirin et al. 2009a). Therefore, significant but weak correlations between IPA and explicit positive affect and between INA and explicit negative affect is expected. Given the orthogonal structures of IPA and INA, Quirin et al. (2009a) proposed a significant negative correlation between IPA and attachment avoidance rather than a negative correlation between IPA and attachment anxiety; and a significant positive correlation between INA and attachment anxiety rather than a positive correlation between INA and attachment avoidance. A similar pattern is expected in the current study. It is expected that IPA will be significantly and positively related to extraversion, and INA will be significantly and positively related to neuroticism, as found in previous research (e.g., Costa and McCrae 1980, Larssen and Katelaar 1989). Previous research reported that physical complaints were related to reward deprivation, rather than low levels of well-being. Moreover, negative affect was found to be related to expectations of punishment, and low levels of well-being was found to be related to removal of reward expectation (Baumann et al. 2005). Hence, it is expected that somatization would be positively correlated with INA, but not with IPA. Within the context of the Personality Systems Interaction Theory (PSI theory), Kuhl (2000) argued that rumination about failures can be overcome by decreasing the negative affect and activation of the processes that are important in engaging highly challenging tasks can be achieved by increasing the positive affect. Therefore, it is expected that a personality characterized by rapid detachment from ruminative thoughts about past failures would correlate with INA negatively rather than IPA; and a personality that is capable of activating the processes for fast initiation of difficult tasks would correlate with IPA negatively rather than INA. According to PSI theory, mechanisms that have important functions on cognitive activities are processed at the implicit level (Kuhl 2000). In this respect, implicit affect and personality traits, described by a theory encompassing implicit processing, are expected to demonstrate the relationship patterns depicted above.

Finally, it is aimed to test the measurement invariance of the IPANAT-TR across student and employee samples. Although the IPANAT had been used in previous research with student and employee samples, the measurement invariance

across these two samples had not been examined. Since the original study was conducted with mostly students, it is important to test whether or not the IPANAT-TR measures the same implicit affect concept across these samples. In the measurement invariance test, it will be tested that whether or not the scale has configural, metric, scalar, and error variance invariance across student and employee samples. Thus, in addition to test of the IPANAT in Turkish language, this study makes an original contribution to literature by testing the characteristics of the IPANAT that have not been previously examined.

## METHOD

### Participants

The IPANAT-TR form was initially distributed to 603 undergraduate students at Ege University's Psychology and the Sociology departments and 512 part-time and full-time employees in public and private institutions from education, health care, finance and marketing sectors at İzmir province. The forms were completed by 94% of the student and 72% of the employees. Thus, the research data were acquired from 569 students and 369 employees, totaling 938 participants. The demographic information on the participants is presented in Table 1.

### Data Collection Instruments

#### The Implicit Positive and Negative Affect Test (IPANAT):

The IPANAT is an indirect measure of affect in which participants provide 6 affect ratings for each of the 6 meaningless words using a 4-point (1 = does not fit at all, 4 = fits very well) Likert type scale (Quirin et al. 2009a).

Participants are given a cover instruction stating that the meaningless words were onomatopoeic words taken from an artificial language and a total of 36 ratings are obtained. The IPA and INA dimensions are constructed in two stages. In the first step, the average of 6 artificial word judgments was computed for each affect adjective. In the second step, the IPA and INA scores were calculated by averaging 3 positive and 3 negative mood adjectives, respectively. Quirin et al. (2009a) reported internal consistency score of 0.81 for both IPA and INA. One-week test-retest reliability scores were 0.72 for IPA and 0.76 for INA. One-year test-retest reliability score was around 0.60 for both IPA and INA, indicating a consistent implicit affect measure. The IPANAT demonstrated good factor structure. Factor loadings were between 0.80 and 0.90, and cross-loadings were lower than 0.10. IPA and INA appeared as orthogonal constructs as the correlation between them was not significant ( $r = 0.03$ ). Support was found for the hypothesized relationships between the IPANAT and related constructs, including the explicit affect measures, the semi-implicit affect measures, and personality variables related to affectivity, which suggested that the IPANAT demonstrated construct validity. Lastly, Quirin et al. (2016) compared the IPANAT across 10 countries and found metric invariance across 9 of them.

**The Positive and Negative Affect Schedule (PANAS):** The scale was developed by Watson et al. (1988) and translated to the in Turkish language by Gençöz (2000). The scale has 20 items with 2 dimensions, 10 for assessing positive affect and 10 for negative affect. It has 5-point scale ranging from 1 = very slightly or not at all to 5 = extremely. The internal consistency scores were 0.86 for positive affect and 0.83 for negative affect (Gençöz 2000).

**The Experiences in Close Relationship Inventory-Revised (ECR-R):** The inventory was developed by Fraley et al. (2000) and translated to the Turkish language by Selçuk et al. (2005). The inventory consists of 18-items avoidance and 18-items anxiety dimensions. The items are rated by a 7-point Likert type scale ranging from 1 = strongly disagree to 7 = strongly agree. Selçuk et al. (2005) reported an internal consistency value of 0.90 for avoidance and 0.86 for anxiety.

**The Big-Five Inventory (BFI):** The inventory was developed by Benet-Martínez and John (1998) and translated in Turkish by Sümer et al. (2005). Basım et al. (2009) also evaluated the scale and found that 36-item revised form showed good psychometric properties. The inventory has 5 dimensions and 44 items. Extraversion and neuroticism dimensions were utilized in this study. The items were rated on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree. Sümer et al. (2005) reported internal consistency values

**Table 1.** Demographic Data of the Participants

	Student	Employee	All
Age	$M = 21.01$ ( $SD = 2.77$ )	$M = 37.05$ ( $SD = 11.52$ )	$M = 27.28$ ( $SD = 10.84$ )
Gender	76% female ( $N = 435$ ) 24% male ( $N = 134$ )	59% female ( $N = 218$ ) 41% male ( $N = 151$ )	70% female ( $N = 653$ ) 30% male ( $N = 285$ )
Education	96% undergraduate ( $N = 547$ ) 4% high school and below ( $N = 22$ )	64% undergraduate ( $N = 238$ ) 25% high school and below ( $N = 93$ ) 10% university graduate ( $N = 38$ )	84% undergraduate ( $N = 785$ ) 12% high school and below ( $N = 115$ ) 4% university graduate ( $N = 38$ )

ranging between 0.64 and 0.77 for 5 dimensions, while the values ranged between 0.60 and 0.73 in Basım et al. (2009).

**The Symptom Checklist (SCL-90-R):** The scale was developed by Derogatis (1977), and the Turkish language version was evaluated by Dağ (1991). The somatization dimension was used in this study. The scale has 90 items and 9 dimensions, and the somatization dimension has 12 items which are rated by using a 5-point scale (0 = not at all, 4 = extremely).

**The Action Control Scale (ACS-90):** The scale was developed by Kuhl (1994). The original scale consists of 36 items and 3 dimensions, namely, disengagement, initiation and persistence. The participants are asked to choose action or state oriented responses for each situation described in items. The psychometric evaluation of Turkish form of ACS-90 showed that the scale demonstrates factorial and construct validities in a Turkish population<sup>1</sup>. Disengagement and initiation subscales were used in the current study for which the internal consistency values were 0.77 and 0.83, respectively.

**The Demographic Questionnaire:** The demographic questionnaire was prepared to collect information on variables such as age and gender.

### Procedure

In the first phase of the study, the mood adjectives and the scale instruction were translated in Turkish language and a pilot study was carried out to obtain the meaningless words. Scholars working at Ege University's Psychology Department with expertise on the subject of emotions were consulted to ensure accuracy of translation of the mood adjectives. Two scholars fluent in both languages translated the instruction to the Turkish language, and an independent scholar back translated it to English (Brislin 1970). The discrepancies in translations were resolved by considering the recommendations of all 3 translators. The web-based meaningless word generators were used to select meaningless words by taking the letter and syllable counts and the vowel types into account to ensure similarity with the original study. In addition to the 5 original meaningless words (*TALEP* has an actual meaning in Turkish, so it was removed from word list), 25 generated meaningless words were added to the word list. 57 undergraduate students who were not among the participants of the study, evaluated the words in terms of pleasantness, familiarity, meaning, and associative value using a 5-point scale (1 = very little 5 = very much). As in the original study, for each meaningless word, participants

<sup>1</sup>The manuscript examining psychometric properties of Action Control Scale is under preparation. The first author can provide details of analyses and results upon request.

were given 30 seconds to write any related words that came to mind in order to assess associative value and the total score of these words were computed. The 6 meaningless words (*DORİP, COMUB, NUPEG, DİSEG, CULAD, KİCOB*) among the ranked 10 with the lowest average scores based on the criteria described above were selected to be used in the scale. The meaningless words obtained in the original study were not included in the final form since they did not appear to be the least meaningless words. A similar case was observed in 2 of the 10 countries in the study conducted by Quirin et al. (2016).

The employees were reached by using the personal contacts of the researchers. Scale forms were delivered either on the internet or printed on paper. The students used the printed form only. The study was started after obtaining the approval of the Ege University Scientific Research and Publication Ethics Committee. All participants signed an informed consent form. 46 participants were contacted after 1 week and 55 were contacted after 4 weeks to obtain second measurements for test-retest reliability.

## RESULTS

### Factorial Validity

Factorial validity was tested by utilizing the principal components analysis in the SPSS 20.0 (IBM corp. 2011) software, and the results were interpreted by using Varimax rotation. (see Table 2).

**Table 2.** Factor Analysis Results of the IPANAT-TR

	F1: IPA	F2: INA
Cheerful	0.93	0.08
Happy	0.92	0.06
Energetic	0.92	0.13
Inhibited	0.05	0.89
Helpless	0.06	0.88
Tense	0.15	0.87
Explained variance	43.14	38.73
Eigenvalue	2.94	1.97
Correlation	$r(936) = 0.19^{**} / 0.08^{*a}$	

*N* = 938; <sup>a</sup>Correlation between implicit positive affect and implicit negative affect after controlling for the mood adjectives energetic and tense (Quirin et al. 2016);

IPA: Implicit Positive Affect; INA: Implicit Negative Affect.

\**p* < 0.05, \*\**p* < 0.01

The results showed that both negative and positive adjective scores loaded their corresponding factors (the loadings were between 0.87 and 0.93). The cross-loadings, on the other hand, were low and ranged between 0.05 and 0.15. The variance explained was 43.14% for IPA and 38.73% for INA. The mean IPA value was 2.05 ( $SD = 0.51$ ) and the mean INA value was 1.98 ( $SD = 0.46$ ), which were close to each other and to the mid-point of scale. The correlation between two subscales was  $r = 0.19$ ,  $p < 0.01$ , which does not confirm the result in the original study that IPA and INA are orthogonal constructs. However, similar findings were also observed in the study of Quirin et al. (2016). After controlling for the two arousal related adjectives (energetic and tense), the recalculated correlation was found to be significantly weaker ( $r = 0.08$ ;  $Z = 2.43$ ;  $p < 0.01$ ). Altogether, these results support the factorial validity of the IPANAT-TR

### Descriptive Statistics

The mean IPA value was 2.03 ( $SD = 0.49$ ) for the female and 2.09 ( $SD = 0.56$ ) for the male participants, while the mean INA value was 1.97 ( $SD = 0.46$ ) for the female and 1.99 ( $SD = 0.59$ ) for the male participants. The t-test results did not show any significant gender differences for both IPA and INA. The comparison between employee and student samples showed no significant difference between employees ( $M = 2.07$ ,  $SD = 0.59$ ) and students ( $M = 2.03$ ,  $SD = 0.46$ ) for IPA. However, the employees reported lower INA ( $M = 1.93$ ,  $SD = 0.46$ ) compared to the students ( $M = 1.98$ ,  $SD = 0.46$ );  $t(936) = 2.48$ ,  $p < 0.05$ . Lastly, the difference between mean IPA ( $M = 2.05$ ,  $SD = 0.51$ ) and mean INA ( $M = 1.98$ ,  $SD = 0.46$ ) was significant;  $t(937) = 3.56$ ,  $p < 0.01$ .

### Reliability Analyses

The reliability of the IPANAT-TR was assessed by estimating internal consistency, one-week and four-week test-retest reliability scores. Cronbach's alpha scores were 0.92 for IPA and 0.85 for INA. One-week test-retest reliability ( $N = 46$ ) values were 0.75 for IPA and 0.62 for INA. Lastly, four-week test-retest reliability ( $N = 55$ ) values were 0.66 for IPA and 0.51 for INA. These results confirm that the IPANAT-TR demonstrated high internal consistency. The test-retest reliability values, on the other hand, may indicate that the IPANAT-TR has a stronger state component.

### Construct Validity

Correlations between the IPANAT-TR and related constructs are presented in Table 3.

**Table 3.** Correlations between the IPANAT-TR and Other Related Constructs

	IPA	INA
PANAS-positive	0.17**	0.01
PANAS-negative	-0.02	0.18**
Avoidance	-0.01	0.05
Anxiety	0.02	0.17**
Extraversion	0.12**	-0.05
Neuroticism	-0.09**	0.11**
Somatization	0.04	0.24**
ACS-disengagement	0.06	-0.07*
ACS-initiation	0.06	-0.12**

*N* = 938; IPA: Implicit Positive Affect; INA: Implicit Negative Affect; PANAS: Positive and Negative Affect Scale; ACS: Action Control Scale.  
\* $p < 0.05$  \*\*  $p < 0.01$ .

The results showed that correlations between the IPANAT-TR and other related constructs were mostly in the expected direction and magnitude. Confirming the predictions, IPA was positively correlated with the positive affect dimension of the PANAS and INA was positively correlated with the negative affect dimension of the PANAS. As expected, relationship avoidance did not correlate with INA, but contrary to the expectations, it also did not correlate with IPA. Relationship anxiety correlated positively with INA but not with IPA, confirming the expected pattern. As expected, extraversion correlated positively with IPA but not with INA. Neuroticism showed negative correlation with IPA and positive correlation with INA, partially supporting the expectations. Somatization dimension of the SCL-90 showed, as expected, a significant negative correlation with only INA. Lastly, confirming the expectations, the disengagement dimension of the ACS-90 showed significant negative correlation with only INA. However, contrary to the expected, the initiation dimension correlated negatively and significantly with INA, but did not correlate with IPA. Overall, the results suggest that the IPANAT-TR shows construct validity.

### Measurement Invariance

As the last step of the study, the measurement invariance of the IPANAT-TR between the student and the employee samples were investigated. Starting from liberal model, constraints were added at each stage to test more conservative models. The significance of the differences between model fits after adding each constraint was assessed with the comparative fit index (CFI)  $< 0.01$  criterion suggested by Cheung and Rensvold (2002). For the model identification, factor variances were

**Table 4.** Results of Measurement Invariance of the IPANAT – TR

	$X^2$	$df$	RMSEA	CFI	$\Delta CFI$	Decision
Full configural invariance	60.83	16	0.077	0.987	-	accept
Full metric invariance	91.38	22	0.082	0.979	0.008	accept
Full scalar invariance	121.06	28	0.084	0.972	0.007	accept
Full error variance invariance	151.57	34	0.086	0.965	0.007	accept

*N* = 938; RMSEA: root mean square error of approximation; CFI: comparative fit index

fixed to 1 and the loadings of first items in each factor were freed. The Mplus 7 statistics program (Muthén and Muthén 1998-2012) was used for the analyses. The results are shown in Table 4.

Results of the analyses showed that the scale had the same factor structure across student and employee samples, showing configural invariance. Following this step, the factor loadings were constrained across two samples, and model change was checked with CFI. As the CFI difference value was below the criterion, metric invariance of the IPANAT-TR was accepted. Next, the intercept values were constrained across two samples and model CFI was investigated. The change was negligible and met recommended change threshold, which resulted in accepting the scale's scalar invariance. Lastly, the residual values of the items were constrained across the two samples to examine model change. It was concluded that the IPANAT-TR shows error variance invariance.

## DISCUSSION

This study tested factorial validity, internal consistency, test-retest reliability, construct validity, and measurement invariance of the IPANAT-TR. The factor analysis showed that the IPANAT-TR has a definite two-factor structure. However, unlike the results of the original study, IPA and INA did not emerge as orthogonal factors of the IPANAT-TR but correlated positively and significantly. Quirin et al. (2016) observed similar findings in 5 countries and argued that the emotional adjectives in the IPANAT may be more sensitive to cultural differences compared to the explicit affect measures.

Reliability analyses showed that both IPA and INA have high internal consistency. However, one-week and four-week interval test-retest reliability scores were lower than the reported values in Quirin and et al. (2009a), especially for INA. Quirin et al. (2009a) argued that the IPANAT has both

state (environmental affect cues) and trait (accessibility of affect) components, and that variances accounted for by these components are regarded as measurement variance. Hence, the test-retest scores of the IPANAT-TR may be interpreted as either an indication of low internal consistency or its sensitivity to state clues.

Majority of the construct validity test results supported the predictions. For example, the IPANAT-TR was found to have low but significant correlation with explicit affect measurements. These findings suggest that even though both implicit and explicit affect scales aim to measure affect states of individuals, they may tap into different processes related to affect, which should be taken into account. The implicit affect approach explains this difference by arguing that the cognitive and motivational factors interfere with measurement of explicit affect. Supporting this claim, study designs or interventions that diminished the effect of such factors also increased the correlation between implicit and explicit affect (e.g., Quirin et al. 2009a, Remmers et al. 2018). The attachment type-IPANAT-TR correlations and neuroticism-IPANAT-TR correlation partially supported expectations. One reason for this result may be the non-orthogonal structure of IPA and INA observed in evaluation of the IPANAT-TR. The predictions regarding adult attachment styles and neuroticism were based on the orthogonal affect conceptualization (see Costa and McCrae 1980). Thus, the non-orthogonality of IPA and INA may explain why some expected relationships were not observed. The expectation that somatization will be correlated only with INA was based on work of Baumann et al. (2005), and contributing to construct validity, it was confirmed. Partial support was provided for the expected relationship between the IPANAT-TR and personality structures defined on the basis of preoccupation/disengagement and hesitation/initiation continuum. However, the results did not completely contradict the action control and personality systems interaction theories. Even though different affect regulation types activate different modes of thinking, transitions of effects are also possible, especially for the mode that is associated with down-regulation of negative affect (Kuhl 2000). Moreover, disengagement and initiation are related dimensions of action orientation and a conceptualization of action control suggests that they may constitute a single dimension of action control (see Diefendorff et al. 2000). These results may offer an explanation to why INA showed similar relationships with disengagement and initiation dimensions.

As a last step, testing the measurement variance of the IPANAT-TR across the students and the employees demonstrated that the scale worked similarly and reliably in both samples.

## REFERENCES

- As in any study, this study has its limitations. Firstly, this study did not test the convergent validity between the IPANAT-TR and other implicit affect scales. Thus, showing its convergent validity with implicit affect measures such as the word stem completion test with emotive words is a possible aim for future studies. Secondly, this study did not test the state component of the IPANAT-TR. However, both the theoretical background of the IPANAT and the relatively low temporal consistency scores may imply that implicit affect displays temporal fluctuations and therefore there may be a merit in testing the IPANAT-TR as a state implicit affect measure. Kuhl et al. (2017) used the IPANAT in this respect but they utilized the same meaningless words across measures. However, using same words for all daily implicit affect measurements may lead biased estimations given that instruction of the IPANAT relies on a cover story. Therefore, testing a state IPANAT-TR with a larger pool of meaningless words would provide information about state and trait components of the IPANAT-TR, and would be an alternative affect measure for studies that use state affect.
- Testing the IPANAT-TR with different clinical samples may also be an aim for future studies. The IPANAT has recently been used with clinical samples without assessment of measurement invariance (e.g., Dekker and Johnson 2018). Demonstration of measurement invariance across such samples is important for reliable comparisons in clinical research.
- The IPANAT-TR offers short, effective and easy-to-use measurement of implicit affect, but it may be challenging to understand especially for participants with low level of education. In such circumstances, the researcher should make sure that the participant understands the instruction and rating.
- In conclusion, the IPANAT-TR emerges as a useful tool for measuring affect as it provides indirect, reliable and valid measurement. As argued by Quirin et al. (2009a), the IPANAT may be an alternative psychometric tool to measure affect particularly in cases of alexithymia, a phenomenon characterized by inability to perceive or express emotions or in cases of defense mechanisms such as repression and denial in which the affect is altered at consciousness. Moreover, the IPANAT-TR's significant relationship with physiological indicators makes it a plausible measurement for studies that investigate the relationship between physiological indicators and affect. We believe that all these advantages make the IPANAT-TR a useful alternative to measure affect for researchers and practitioners in Turkey.
- Author's note:** *This study was presented as poster at 5th International Symposium on Brain and Cognitive Science, 6th May 2018, Istanbul.*
- Basim HN, Çetin F, Tabak A (2009) The relationship between big five personality characteristics and conflict resolution approaches. *Turk Psikol Derg* 24: 20-34.
- Baumann N, Kaschel R, Kuhl J (2005) Striving for unwanted goals: Stress-dependent discrepancies between explicit and implicit achievement motives reduce subjective well-being and increase psychosomatic symptoms. *J Pers Soc Psychol* 89: 781-99.
- Benet-Martinez V, John OP (1998) Los cinco grades across cultures and ethnic groups: Multitrait-multimethod Analyses of the big five in Spanish and English. *J Pers Soc Psychol* 75: 729-50.
- Brislin RW (1970) Back-translation for cross-cultural research. *J Cross Cult Psychol* 1: 185-216.
- Cheung GW, Rensvold RB (2002) Evaluating goodness-of-fit indexes for testing measurement invariance. *Struct Equ Modeling* 9: 233-55.
- Costa PT, McCrae RR (1980) Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *J Pers Soc Psychol*, 38: 668-78.
- Dağ I (1991) Symptom Check List (SCL-90-R): A reliability and validity study. *Turk Psikiyatr Derg* 2: 5-12.
- Dekker MR, Johnson SL (2018) Major depressive disorder and emotion-related impulsivity: Are both related to cognitive inhibition? *Cognitive Ther Res* 42: 1-10.
- Derogatis LR (1977) SCL-90: Administration, scoring and procedures manual-I for the revised version. Baltimore, MD, Johns Hopkins University School of Medicine.
- Diefendorff JM, Hall RJ, Lord RG et al (2000) Action-state orientation: Construct validity of a revised measure and its relationship to work-related variables. *J Appl Psychol* 85: 250-63.
- Dukalski B, Quirin M, Kersting A et al (2017) Implicit affectivity in patients with borderline personality disorder. *Rivista di Psichiatria* 52: 83-9.
- Fralely RC, Waller NG, Brennan KA (2000) An item response theory analysis of self-report measures of adult attachment. *J Pers Soc Psychol* 78: 350-65.
- Gençöz, T (2000) Positive and Negative Affect Schedule: A study of reliability and validity. *Turk Psikol Derg* 15: 19-26.
- IBM Corp (2011) IBM SPSS Statistics for Windows, version 20.0, Armonk, NY, IBM Corp.
- Kuhl J (1994) Action versus state orientation: Psychometric properties of the Action Control Scale (ACS-90). Volition and personality: Action versus state orientation, J Beckmann, J Kuhl (Ed.), Seattle, WA, Hogrefe and Huber. p. 47-59.
- Kuhl J (2000) A functional-design approach to motivation and self-regulation: The dynamics of personality systems interactions. *Handbook of self-regulation*, M Boekaerts, PR Pintrich, M Zeidner (Ed.), New York, Academic Press, p. 111-69.
- Kuhl J, Mitina O, Koole SL (2017) The extended trust hypothesis: Single-attractor self-contagion in day-to-day changes in implicit positive affect predicts action-oriented coping and psychological symptoms. *Nonlin Dynam Psychol* 21: 505-18.
- Mossink JC, Verkuil B, Burger AM et al (2015) Ambulatory assessed implicit affect is associated with salivary cortisol. *Front Psychol* 6: 111.
- Muthén LK, Muthén BO (1998-2012) Mplus User's Guide. Seventh edition. Los Angeles, CA, Muthén and Muthén.
- Quirin M, Bode RC (2014) An alternative to self-reports of trait and state affect. *Eur J Psychol Assess* 30: 231-37.
- Quirin M, Kazén M, Kuhl J (2009a) When nonsense sounds happy or helpless: The Implicit Positive and Negative Affect Test (IPANAT). *J Pers Soc Psychol* 97: 500-16.
- Quirin M, Kazén M, Rohrmann S et al (2009b) Implicit but not explicit affectivity predicts circadian and reactive cortisol: Using the Implicit Positive and Negative Affect Test. *J Pers* 77: 401-26.
- Quirin M, Wróbel M, Pala A et al (2016) A Cross-cultural validation of the Implicit Positive and Negative Affect Test (IPANAT): Results from ten countries across three continents. *Eur J Psychol Assess* 34: 52-63

- Remmers C, Zimmermann J, Buxton A et al (2018) Emotionally aligned: Preliminary results on the effects of a mindfulness-based intervention for depression on congruence between implicit and explicit mood. *Clin Psychol Psychot* 1-10.
- Robinson MD, Clore GL (2002) Belief and feeling: Evidence for an accessibility model of emotional self-report. *Psychol Bull* 128: 934-60.
- Selçuk E, Günaydın G, Sümer N et al (2005) A new scale developed to measure adult attachment dimensions: Experiences in Close Relationships-revised (ECR-R) - psychometric evaluation in a Turkish sample. *Türk Psikoloji Yazıları* 8: 1-11.
- Sümer N, Lajunen T, Özkan T (2005) Big five personality traits as the distal predictors of road accident. *Traffic and transport psychology: Theory and application*, G. Underwood (Ed.) Oxford, UK, Elsevier, p. 215-27.
- Smith ER, DeCoster J (2000) Dual-process models in social and cognitive psychology: Conceptual integration and links to underlying memory systems. *Pers Soc Psychol Rev* 4: 108-31.
- Strack F, Deutsch R (2004) Reflective and impulsive determinants of social behavior. *Pers Soc Psychol Rev* 8: 220-47.
- Van Der Ploeg MM, Brosschot JF, Thayer JF et al (2016) The implicit positive and negative affect test: Validity and relationship with cardiovascular stress-responses. *Front Psychol* 7: 425.
- Watson D, Clark LA, Tellegen A (1988) Development and validation of brief measures of positive and negative affect: The PANAS scales. *J Pers Soc Psychol* 54: 1063-70.
- Watson D, Walker LM (1996) The long-term stability and predictive validity of trait measures of affect. *J Pers Soc Psychol* 70: 567-77.