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Psychometric properties of the Macedonian version of the Implicit Positive and Negative Affect Test (IPANAT–M)

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The aim of this study was to analyze the psychometric properties of the Macedonian version of the Implicit Positive and Negative Affect Test (IPANAT–M; Quirin, Kazén, & Kuhl, 2009). First, in a pretest study, it was shown that two of the artificial words from the original test needed to be replaced, since they were not free of meaning in a Macedonian context. Two new artificial words were included in the IPANAT–M. Study 1 showed that the IPANAT–M had satisfactory test-retest reliability over a period of one week. In Study 2, the factorial validity of the test was explored. The two factor solution explained 63.91% of the total variance, and the factors could be easily interpreted as implicit positive and implicit negative affect. The results indicate that IPANAT–M has satisfactory psychometric properties.

Key words: implicit affect, IPANAT–M, psychometric properties

In recent years there has been a renewed interest in alternative modes of assessment that go beyond self-reports (Ortner & van de Vijver, 2015). Numerous behavior-based measures have been developed for the assessment of implicit motives (for a review, see Chasiotis, 2015), personality (see Ortner & Proyer, 2015), attitudes (see Smith & Ratliff, 2015), and affect (see Kaufman & Baumann, 2015).

The term affect could be understood as a positive and negative evaluative response tendency. Also, it is "a label for the superordinate category of moods, feelings, and emotions" (Kaufman & Baumann, 2015, p. 97). One of the most widely used explicit measure of positive and negative affect is the Positive and Negative Affect Schedule (PANAS), developed by Watson, Clark, and Tellegen (1988). However, people are not always willing or able to communicate their true affect, so indirect measurement techniques have gained popularity in contemporary psychology. Kaufmann and Baumann (2015) categorize these procedures, which attempt to capture the affect that cannot or will not be verbalized, as measures of association, projective measures, and behavioral observations of affect.

Projective measures historically could be tracked down to the Rorschach Inkblot Test (Rorschach, 1921). The main assumption is that "affect influences the interpretation of novel and ambiguous stimuli and situations" (Kaufman & Baumann, 2015, p. 100). Recently developed projective measures that assess affect are The Implicit Positive and Negative Affect Test (IPANAT; Quirin, Kazén, & Kuhl, 2009), The Operant Motive Test (Kuhl & Scheffer, 1999; Scheffer, 2005; Scheffer, Eichstaedt, Chasiotis, & Kuhl, 2007), and a broader category of figure placement techniques (Family System Test, Gehring, 1998; Gehring, Debry, & Smith, 2001; see also Field & Field, 2013; Field & Storksen-Coulson, 2007).

The Implicit Positive and Negative Affect Test

For the conceptualization of implicit affect, Quirin, Kazén, and Kuhl (2009) adopt a systems approach toward information processing. More precisely, a distinction between an associative (impulsive) and reflective information processing systems is proposed (Smith & DeCoster, 2000, Strack & Deutsch, 2004, as cited in Quirin, Kazén, & Kuhl, 2009). It is postulated that the associative system operates on the basis of automatic spreading activation of representations, whereas the reflective system operates on the basis of conceptual propositions and classifications. In this sense, implicit affect is defined as "the automatic activation of cognitive representations of affective experiences" (Quirin, Kazén, & Kuhl, 2009, p. 501). On the other hand, conceptual classifications of the reflective system correspond to explicit (self-report) measures (Quirin, Kazén, & Kuhl, 2009).

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The IPANAT has been developed for indirect measurement of affect "by asking participants to rate the extent to which artificial words from a putative artificial language express certain moods" (Quirin, Kazén, & Kuhl, 2009, p. 502). The authors chose six artificial words (*SAFME, VIKES, TUNBA, TALEP, BELNI, SUKOV),* which were pretested for pleasantness, familiarity, semantic meaning, and associative value. Each one of these words are given to the participants together with three positive (happy, cheerful, energetic), and three negative (helpless, tense, inhibited) emotion words. The rationale behind the test is that "participants provide information about their emotional states or traits incidentally and without awareness" (Quirin, Kazén, & Kuhl, 2009, p. 503). In order to accomplish this, instructions are created that should redirect the attention of the subjects from the actual aim of measurement, and it is assumed that participants' attention will be focused on the features of the artificial words (Quirin, Kazén, & Kuhl, 2009). The instructions are given in Appendix A.

Quirin, Kazén, and Kuhl (2009) identified three sources of variance for the IPANAT, namely, state, trait, and error variance (subjective associations that individuals may have with artificial words). Their study provides evidence for adequate internal consistency, test-retest reliability, stability, and constructs validity. It was shown that the IPANAT also measures state variance, and additionally, evidence for criterion-based validity is given. Quirin, Kazén, Rohrmann, and Kuhl (2009) also demonstrate the discriminant validity of the scales.

Aims of the present study

First, in the pretest study the aim was to investigate whether the six artificial words are applicable to a Macedonian context, since the semantics of the words may vary with language and culture (Quirin, Kazén, & Kuhl, 2009). The artificial words were evaluated using the same criteria of pleasantness, familiarity, meaning, and associative value. Next, in Study 1, the aim was to explore the psychometric properties of the Macedonian version of the IPANAT (IPANAT–M). Specifically, we investigated retest reliability across an interval of one week. Finally, in Study 2, internal consistency and factorial validity of the IPANAT–M were examined using a larger and more heterogeneous sample.

PRETEST STUDY

Method

A group of 16 psychology students participated in the pretest study. The artificial words from the IPANAT (Quirin, Kazén, & Kuhl, 2009) were presented to the participants who were asked to evaluate the words with respect to the four criteria: pleasantness, familiarity, meaning, and associative value. The six artificial words (*SAFME, VIKES, TUNBA, TALEP, BELNI, SUKOV*) from the original IPANAT (Quirin, Kazén, & Kuhl, 2009) were used.

Results

The evaluations of the participants indicated that two words (*TALEP* and *BELNI*) were not neutral and free of meaning in a Macedonian context. Specifically, the word *TALEP* was frequently associated with *SALEP* (a Turkish beverage which is well known in Macedonia); while for the word *BELNI*, many of the participants associated it with something white (the first syllable *BEL* translates as white in Macedonian). For the subsequent studies, these words were discarded. Twelve new artificial words were invented and given to six individuals who rated them on the same criteria. The words *MIPOK* and *TANIP* were chosen as they had been rated as most neutral, unfamiliar, and free of meaning, and these two new artificial words were included in the IPANAT–M. The IPANAT–M is given in appendix A.

STUDY 1

Method

The sample included 39 (5 males) participants. All of the subjects were first year psychology students from Ss Cyril and Methodius University in Skopje. The mean age of the subjects was 19.10 years (SD = 0.94). Participants completed the IPANAT–M at the beginning of a psychology course and one week later.

The Macedonian version of the Implicit Positive and Negative Affect Test (IPANAT–M) was used. For each of the artificial words (*SAFME, VIKES, TUNBA, MIPOK, TANIP, SUKOV*) participants indicated on a four-point answer scale (1 = *doesn't fit at all*, 2 = *fits somewhat*, 3 = *fits quite well*, and 4 = *fits very well*) to what extend does the sound of the artificial word convey each of the following moods: happy, helpless, energetic, tense, cheerful, and inhibited. Positive affect (PA) and negative affect (NA) are computed by averaging adjective scores derived from positively valenced and negatively valenced adjectives (Quirin, Kazén, & Kuhl, 2009).

Results

After participants completed the test for the second time, they responded to a question about the presumed underlying aim of the IPANAT-M. Although the test was completed in an emotion and motivation course, only four individuals suggested that the test might assess affective states and were excluded from the initial sample of 43 subjects. It should be noted that the number of subjects who were aware of the

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Table 1
Pearson correlations, means, and standard deviations for Implicit Positive and Negative Affect scores as measured at first time of assessment (1) and one week later (2)

Measure	PA2	NA1	NA2	*M*	*SD*
PA1	**.71*** **	.09	.18	2.10	0.39
PA2		.01	.06	2.05	0.29
NA1			**.63*** **	2.05	0.29
NA2				2.01	0.37

Note. N = 39. Pearson coefficients in boldface are test-retest reliability.
PA = positive affect; NA = negative affect.
*** $p < .001$.

Table 2
Descriptive statistics and internal consistency for the Implicit Positive and Negative Affect – Macedonian version

Mood adjective score	*M*	*SD*	SK	K	CITC
Happy	2.13	0.47	-0.03	-0.45	.58
Energetic	2.28	0.52	-0.07	-0.10	.56
Cheerful	2.16	0.50	0.29	0.27	.63
PA	2.19	0.41	-0.14	0.45	
Helpless	2.12	0.45	0.28	-0.06	.45
Tense	2.28	0.51	-0.01	-0.21	.49
Inhibited	2.02	0.52	0.20	-0.13	.49
NA	2.14	0.38	-0.12	-0.11	

Note. N = 195. SK = skewness; K = kurtosis; CITC = corrected item-total correlation; PA = positive affect; NA = negative affect.

actual aim of measurement is comparable with the number that Quirin, Kazén, and Kuhl (2009) reported. In their study, three individuals were excluded and they also used a sample of psychology students.

Descriptive statistics and test-retest reliability (correlation between the scores across an interval of one week) are given in Table 1. Table 1 show that the mean PA scores at the first time of the assessment, and those after one week, were only slightly higher than the mean NA scores, respectively. Quirin, Kazén, and Kuhl (2009), reported that the PA scale showed higher mean values than did the NA scale, which could be expected in a population of college students. Test-retest reliability, across an interval of one week, was satisfactory. Namely, the correlation between the PA scores was .71, and between the NA scores was .63.

STUDY 2

Method

The sample included 195 participants (62.1% women). The mean age of the subjects was 28.02 years (*SD* = 12.81). Participants were selected by convenience sampling and data were collected by psychology students in an individual setting. The Macedonian version of the Implicit Positive and Negative Affect Test (IPANAT–M) was used (see Study 1 instruments).

Table 3
Varimax-rotated factor loadings of the adjective scores for the Implicit Positive and Negative Affect – Macedonian version

Mood adjective score	Factor 1: Implicit PA	Factor 2: Implicit NA
Cheerful	.85	-.07
Happy	.82	-.05
Energetic	.80	.11
Inhibited	.06	.78
Tense	-.05	.78
Helpless	-.01	.75

Note. N = 195. PA = positive affect; NA = negative affect.

Results

Descriptive statistics (mean scores, standard deviations, skewness, kurtosis) and corrected-item total correlations for the adjective scores can be found in Table 2. Table 2 shows that the mean scores for PA and NA were almost identical. All of the corrected item-total correlations were greater than .33 (Ho, 2006). Additionally, Cronbach alpha was .76 for PA, and was .66 for NA.

A principal component analysis (PCA) with varimax rotation was performed for the IPANAT–M, in accordance to Quirin, Kazén, and Kuhl (2009). The KMO value was .67, and Bartlett's test showed statistical significance, $\chi^2(15) = 230.71$, $p < 0.01$. Parallel analysis was applied in order to determine the number of components to retain (e.g., O'Connor, 2000; Zwick & Velicer, 1986). The parallel analysis was carried out based on Patil, Singh, Mishra and Donovan (2007) engine and it led to an estimate of two components to retain. The two factor solution explained 63.91% of the total variance. The contribution of the first component was 33.81% ($\lambda = 2.03$) and the contribution of the second one was 30.1% ($\lambda = 1.8$). The varimax-rotated factor loadings of the adjective scores are depicted in Table 3. It should be added that the correlation between PA and NA was not significant, $r = -.01$, $p > 0.05$.

DISCUSSION

The discussion follows the order of the presented studies. Throughout, we will stress the limitations of this investigation and avenues for further research will be provided.

First, in the pretest study, the goal was to investigate are the artificial words from the IPANAT applicable to a Macedonian context. The results showed that two of the words (*TALEP* and *BELNI*) were not free of meaning in the Macedonian language. Consequently, keeping these words in the IPANAT-M would contribute to error variance. The word *TALEP* was associated with the beverage *SALEP*, while the word *BELNI* was associated with something white. For the first artificial word, it could be argued that including it in the IPANAT-M, would result in mood ratings related to the beverage (as it will elicit the association in many subjects), whether the second word had a clearly positive connotation. Most frequent association was wedding dress. Nevertheless, including these artificial words in the IPANAT-M would result in eliciting subjective associations stemming from the characteristics of the artificial words, or in other words, increase of measurement error. Therefore, two new artificial words (*MIPOK* and *TANIP*) were incorporated in the IPANAT–M, as they revealed to be most neutral, unfamiliar and free of meaning in a Macedonian context.

The results from Study 1 indicate that the IPANAT–M had acceptable test-retest reliability of a one-week interval. The association between test and retest measures for PA and NA across an interval of one week (Table 1), are in line with the findings of Quirin, Kazén, and Kuhl (2009) study. However, a limitation of this investigation is that we have only provided test-retest reliability of a short interval over one week. Quirin, Kazén, and Kuhl (2009) reported long-term test-retest stabilities over a period of two months and one year, providing evidence for a strong trait component of implicit PA and implicit NA. Additionally, the sample used in Study 1 was sufficiently small and comprised of psychology students.

The results from Study 2 showed a clear two factor solution for the IPANAT-M, which could be easily, interpreted as implicit PA and implicit NA. The two factor solution was confirmed with Parallel analysis, rather than the eigenvalue-greater-than-one criterion which was used in Quirin, Kazén, and Kuhl (2009) study. Additionally, the orthogonal structure was confirmed in our sample, as PA and NA were not significantly related. The results from the principal component analysis (Table 3) are comparable to the original IPANAT findings. The positive adjectives had high loadings on the first factor (.80-.85), while the negative adjectives had high loadings on the second factor (.75-.78). Furthermore, the internal consistency analysis showed acceptable reliability for both scales. PA had a Cronbach's alpha score of .76, while for NA, the Cronbach's alpha score was somewhat lower (.66).

Definitely, further studies are needed which will provide evidence for the construct validity of the IPANAT–M. Quirin, Kazén, and Kuhl (2009) showed that implicit PA and implicit NA had expected pattern of association with numerous personality, affective states and traits and self-regulation variables. Future investigations should replicate these findings in our country, which will demonstrate adequate validity of the IPANAT–M, as well.

The application of the IPANAT in basic and applied research is abundant (for a review, see Quirin, Kazén, & Kuhl, 2009). A potential use of the instrument, that hasn't been previously mentioned, is in humor appreciation research and in the field of well-being measurement. One of the most well established taxonomy of humor stimuli is the one proposed by Ruch (1992). It has been shown that responses to humor stimuli comprises of two orthogonal components, funniness and aversiveness. In other words, positive and negative responses to humor are best represented by ratings of funniness and aversiveness. Future studies could investigate if the funniness ratings are related to PA, and aversiveness ratings related to NA. On a more broad level, many studies explored the ways that positive affect influences cognitive processes, and used humorous films to induce positive affect (for a review, see Isen, 2008). In the field of well-being research, most commonly, this variable is measured by combining scores for Satisfaction with life and PA and NA (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). In line with Kahneman's general remark psychological phenomena to be measured using combination of more objective approaches, implicit measures for PA and NA would be substantial contribution to such efforts (Kahneman, 1999). Hence, the role of implicit PA, and NA, should be more thoroughly explored in further studies.

In conclusion, this study provides primary evidence for acceptable psychometric properties of the IPANAT–M. Discarding two of the words from the original test, pose difficulties for cross-cultural comparison of test outcomes, since the items in the original test and in the Macedonian version are not the same. However, the IPANAT–M could be a useful instrument that should be used in our cultural setting.

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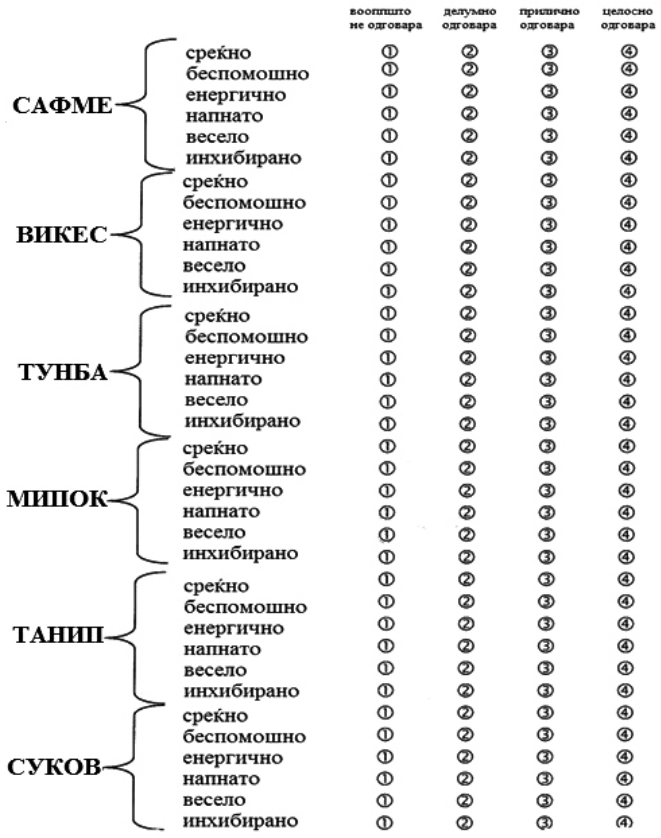
APPENDIX A

Macedonian version of the Implicit Positive and Negative Affect Test (with instructions in English)

The following words are from an artificial language. They are intended to express various moods. In all languages, there are words that help to express their meanings by the way they sound (for example, the word *rattle* almost sounds like something that rattles). In poetry and literature, this is known as onomatopoeia. For each of the following words, please rate how well each artificial word expresses different moods (for example, to what extent does the sound of the artificial word *FILNU* convey each of the following moods: happy, helpless, energetic, tense, cheerful, inhibited)? In making these ratings, let yourself be guided by your spontaneous feelings.



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