Multistudy Report

A Cross-Cultural Validation of the Implicit Positive and Negative Affect Test (IPANAT)

Results From Ten Countries Across Three Continents

Markus Quirin,[1,2] Monika Wróbel,[3] Andrea Norcini Pala,[4] Stefan Stieger,[5,6] Jos Brosschot,[7] Miguel Kazén,[8] Joshua A. Hicks,[9] Olga Mitina,[10] Dong Shanchuan,[11] Ruta Lasauskaite,[12] Nicolas Silvestrini,[12] Patrizia Steca,[13] Maria A. Padun,[14] and Julius Kuhl[8]

[1] Department of Psychology, Stanford University, USA
[2] Department of Psychiatry, Phillips-University Marburg, Germany
[3] Institute of Psychology, University of Lodz, Poland
[4] Department of Psychiatry, Columbia University, USA
[5] Department of Psychology, University of Vienna, Austria
[6] Department of Psychology, University of Konstanz, Germany
[7] Institute of Psychology, Leiden University, The Netherlands
[8] Institute of Psychology, University of Osnabrück, Germany
[9] Department of Psychology, Texas A&M University, USA
[10] Department of Psychology, Lomonosov Moscow State University, Russia
[11] School of Psychology, Southwest University, China
[12] Department of Psychology, University of Geneva, Switzerland
[13] Department of Psychology, University of Milano-Bicocca, Italy
[14] Institute of Psychology, Russian Academy of Sciences, Russia

Abstract: Self-report measures of affect come with a number of difficulties that can be circumvented by using indirect measurement procedures. The Implicit Positive and Negative Affect Test (IPANAT) is a recently developed measure of automatic activation of representations of affective states and traits that draws on participants' ratings of the extent to which nonsense words purportedly originating from an artificial language bear positive or negative meaning. Here we compared psychometric properties of this procedure across 10 countries and provide versions in corresponding languages (Chinese, Dutch, English, French, German, Italian, Polish, Russian, and Spanish). The results suggest good reliability, metric invariance, and construct validity across countries and languages. The IPANAT thus turns out as a useful tool for the indirect assessment of affect in different languages and cultures.

Keywords: implicit affect, indirect assessment, positive affect, negative affect, metric invariance

Although self-reports can provide reliable and valid insights into individuals' inner affective life, they also come with a number of difficulties such as sensitivity to social desirability bias or transparency of research hypotheses (Robinson & Clore, 2002). Therefore, researchers started to develop procedures that measure affect indirectly, such as the Implicit Positive and Negative Affect Test (IPANAT; Quirin, Kazén, & Kuhl, 2009). The IPANAT constitutes a standardized, reliable, brief, and easy-to-apply method for the assessment of implicit affect defined as the automatic activation of cognitive representations of affective experiences

(Quirin, Kazén, & Kuhl, 2009; see also Leventhal & Scherer, 1987).

Whereas the IPANAT has already been applied in different countries to answer a diversity of research questions (e.g., Hicks & King, 2011; Stieger, Voracek, & Nader, 2014; Yik, Russell, & Steiger, 2011), versions in languages other than German have not yet been validated and compared systematically. Thus, the goal of the present work was to examine psychometric properties of the IPANAT across various languages and cultural contexts and to provide versions of the IPANAT for the use in these languages.

© 2016 Hogrefe Publishing

To do so, research teams from 10 countries applied the IPANAT in their national languages, reported on the factor structure of the IPANAT, and related the IPANAT scores to explicit affect scores. Such an endeavor also bears on the question of universality of affect and will accordingly be discussed here.

After contrasting implicit affect with explicit affect, we provide a detailed description of the IPANAT. Next, we give an overview of the studies conducted in different countries. Then we present the information on reliability of the IPANAT, replicability of its factor structure, and convergent and discriminant validity across cultures.

Implicit Versus Explicit Measurement of Affect

Psychologists have long been interested in measuring affect. In the 1980s self-report emerged as the most common way to measure individuals' affective states and traits (Humrichouse, Chmielewski, McDade-Montez, & Watson, 2007). Typically, in the explicit form of assessment, respondents rate the extent to which they have experienced various affective states within a specified time period. Self-report measures of affect are believed to be valid and reliable (for a review, see Humrichouse et al., 2007). However, like other direct measures, they have several limitations which derive from the fact that respondents are openly asked about their feelings. In fact, whereas some individuals can accurately describe their subjective experience, others may either lack the introspective ability to provide correct ratings or alter their responses to conform to social demands (Barrett, Robin, Pietromonaco, & Eyssell, 1998; Robinson & Clore, 2002; Weinberger, Kelner, & McClelland, 1997).

Whereas much research has been directed to developing indirect procedures for the assessment of attitudes (Fazio, Jackson, Dunton, & Williams 1995), self-esteem (Bosson, Swann, & Pennebaker, 2000), motives (Schultheiss & Brunstein, 2001), or stereotypes (Wittenbrink, Judd, & Park, 1997), there is still a considerable need for indirect measures of *affect*. Such measures could complement direct measures of affect to provide supplementary insight into individuals' affective processes. Recently, several procedures for the assessment of implicit affect have been introduced (Bartoszek, 2009; Hass, Katz, Rizzo, Bailey, & Moore, 1992; Langens, 2002; Quirin, Kazén, & Kuhl, 2009). Among them, the IPANAT (Quirin, Kazén, & Kuhl, 2009; see also Quirin & Bode, 2014) qualified as a standardized and reliable method that has been validated in a number of diverse settings (e.g., De Visch, 2012; Hicks & King, 2011; Kazén, Kuhl, & Quirin, 2014; Quirin, Kazén, Rohrmann, & Kuhl, 2009; Selcuk, Zayas, Günaydin, Hazan,

& Kross, 2012; Shimoda, Okubo, Kobayashi, Sato, & Kitamura, 2014; Stieger et al., 2014; Yik et al., 2011).

Following the tradition of research on attitudes, self-esteem, and motives, the output of a procedure aiming at indirectly assessing affect (such as the IPANAT) can be named "implicit affect" (Quirin, Kazén, & Kuhl, 2009; see De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009, for a differentiation between the terms "indirect" and "implicit"). Accordingly, Quirin, Kazén, and Kuhl (2009) conceptualized implicit affect as the automatic activation of cognitive representations of affective experiences which can but need not become processed consciously. On the basis of the dual-systems model (Strack & Deutsch, 2004), the authors proposed that – analogous to explicit and implicit attitudes – explicit representations of affect are processed in a reflective system, whereas implicit representations of affect are processed in an impulsive system. The reflective system involves deliberative processing based on conceptual classifications, whereas the impulsive system operates on the basis of automatically triggered associations. These two systems may interact at various stages of information processing. Consequently, the reflective system may access information processed in the impulsive system. For instance, implicit affect, if intense enough, can be experienced consciously, which results in self-reported explicit affect. However, reflective, direct access to implicit representations of affect may be limited by cognitive and motivational factors we have already mentioned. Thus, the relationship between implicit and explicit affect, similarly to the relationship between implicit and explicit attitudes (Fazio & Olson, 2003; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005), is weak to moderate (Quirin, Kazén, & Kuhl, 2009).

The Implicit Positive and Negative Affect Test (IPANAT)

The IPANAT is an indirect procedure for the assessment of affect, that is, unlike direct measures, it does not rely on people's ratings of their affective experiences. This procedure is very economical as it can be completed via paper-and-pencil in less than 3 min. Participants assess the extent to which six nonsense words (*SAFME*, *VIKES*, *TUNBA*, *TALEP*, *BELNI*, & *SUKOV*), which purportedly originate from an artificial language, express or convey various feelings. To assess their alleged emotional meaning participants use six affectively valenced adjectives. Three adjectives (*happy*, *cheerful*, and *energetic*) refer to positive affect whereas three other (*helpless*, *tense*, and *inhibited*) refer to negative affect, thus forming implicit positive affect and implicit negative affect scales (IPA and INA, respectively; see Quirin, Kazén, & Kuhl, 2009). The two-dimensional

structure of the IPANAT is based on the well-known approach according to which PA and NA are two separate dimensions (Cacioppo & Berntson, 1999; Larsen, McGraw, & Cacioppo, 2001; Watson, Clark, & Tellegen, 1988). The whole test consists of 36 items, with pairs composed of one artificial word and one adjective (6 artificial words × 6 adjectives = 36 combinations). The items are scored on a 4-point scale, ranging from *doesn't fit at all* to *fits very well*. In order to conceal the real aim of the IPANAT, the test begins with the instruction which diverts participants' attention from the fact that their affect is being measured. They are led to believe that it is possible to guess the meaning of artificial words because in all languages there are words that express their meanings by the way they sound (so-called onomatopoeia).

The IPANAT draws on the principle of affect infusion (e.g., Forgas, 1995; Forgas & Bower, 1998) according to which affect exerts an impact on evaluative processes influencing the judgments of unrelated objects. Specifically, in the IPANAT participants' affect is inferred from their phonological judgments of affectively neutral nonsense words. Accordingly, implicit affect, once activated, "colors" the phonological judgments of affectively neutral words in the direction of positive or negative affect – participants experiencing higher levels of positive affect make stronger misattribution of positive affective meaning to the artificial words (e.g., associate *TUNBA* with *happy*), while those experiencing more negative affect rate the artificial words as conveying negative meaning more strongly (e.g., associate *TUNBA* with *helpless*). Thus, the IPANAT scores reflect: (1) state affect (current, short-term fluctuations in affective states, caused by situational factors which influence the judgments of artificial words), (2) trait affect (stable individual differences in the tendency to experience different affective states and, as a result, to ascribe positive/negative meaning to the artificial words), and (3) subjective associations that artificial words may evoke (error variance).

Previous research has shown that, although participants deliberately rate the fit between an artificial word and a positive or negative adjective (as they would in a typical self-report), more than 98% of them believe in the cover story and do not suspect that the test measures affect (Quirin, Kazén, & Kuhl, 2009). Following the reflective-impulsive model by Strack and Deutsch (2004), we assume that in responding to the IPANAT *both* the reflective and impulsive systems are simultaneously active – the reflective system in carrying out the intended phonological judgments

and the impulsive system in creating *associative* bonds between an artificial word and a mood adjective. As such, the IPANAT measures affect implicitly not in terms of involuntary behavioral response but in terms of the uncontrolled influence of affective processes on this response. In this regard, the IPANAT is similar to the affect misattribution procedure that implicitly measures attitudes toward objects on the basis of how participants rate Chinese ideographs primed by these objects (Payne, Cheng, Govorun, & Stewart, 2005). This qualifies the IPANAT as an indirect measure of affect.

Psychometric properties of the IPANAT have been tested in a series of studies (Quirin, Kazén, & Kuhl, 2009). The analyses yielded two separate factors that showed high internal consistency, test-retest reliability, and construct validity. Cronbach's alphas for both IPA and INA were .81, which is high for an implicit test. Correlation coefficients between the scores across 1-week, 1-month, 2-month, and 12-month intervals ranged from .60 to .76, indicating that there is a strong trait component in both IPA and INA. The IPANAT scores correlated positively but moderately with explicit measures of affect, for example, broadly used Positive and Negative Affect Schedule (PANAS; Watson et al., 1988), as well as other measures of positive and negative affectivity: whereas IPA was positively associated with explicit positive affect and extraversion, INA was positively associated with explicit negative affect and neuroticism. Both IPA and INA, similarly to the PANAS (Watson, 2000; Watson & Clark, 1994), were unrelated to participants' gender.[1] Moreover, the IPANAT turned out to be sensitive to changes in affect after the presentation of affective stimuli, which confirmed that the test can also be used for measuring state affect.

Subsequent studies provided further evidence for the reliability of the test and the separability of its dimensions. For example, whereas IPA but not INA predicted circadian variations in cortisol, INA but not IPA predicted cortisol responses to experimentally induced stress (Quirin, Kazén, Rohrmann, et al., 2009). In a study on the interaction between implicit affect and personality, INA interacted with impaired emotion regulation abilities ("state orientation") to predict a tendency toward analytic processing, whereas IPA interacted with high emotion regulation abilities ("action orientation") to predict holistic processing (Kazén et al., 2014). Importantly, in each of the above-mentioned studies measures of explicit affect did not significantly predict performance.

---

[1] Some research suggests that men and women differ on positive and negative affect scales (e.g., Crawford & Henry, 2004). Although these gender differences in affect seem compatible with common beliefs (Fabes & Martin, 1991; Shields, 2002) and with gender differences reported in personality traits (e.g., Costa, Terracciano, & McCrae, 2001), they did not emerge in US normative samples. For instance, Watson and Clark (1994) found no differences between men and women on the PANAS-X scales in 10 large samples including over 8,000 participants (see also Watson, 2000). Similar results were found for the earlier version of the scale (the PANAS; Watson et al., 1988) and for positive and negative emotions assessed with structured diaries (Oatley & Duncan, 1994).

Overview of the Present Research

Although most of the studies using the IPANAT in various settings have been conducted in different countries, the test has not been validated cross-culturally yet. Hence, the comparability of the data collected with the IPANAT in various cultural contexts has not been evaluated. Over the last decades, with a growing awareness of cross-cultural issues, multi-country validation studies have become more and more popular. The reason for their growing popularity is that they enable psychologists to compare research findings from different countries and different languages (Church et al., 2011; Ziegler & Bensch, 2013). For instance, in the explicit affect domain, cross-cultural explorations have shed some light on the universality of a two-dimensional structure of affect. Although over the years the orthogonality of positive and negative affect has been a controversial issue (Crawford & Henry, 2004; Feldman Barrett & Russell, 1998; Schmukle, Egloff & Burns, 2002) and in some populations (e.g., French-Canadian, African American) alternative models were found (Gaudreau, Sanchez, & Blondin, 2006; Merz, et al., 2013), cross-cultural studies have demonstrated that positive and negative affect dimensions are highly generalizable to other languages and cultures (Almagor & Ben-Porath, 1989; Ayuso-Mateos et al., 2013; Thompson, 2007). Furthermore, other characteristics of explicit affect (e.g., correlations with personality factors such as extraversion and neuroticism or manifestations through both short-term transient feelings and relatively stable individual traits) have also been replicated across diverse cultural settings (e.g., Brzozowski, 2010; Gyollai, Simor, Köteles, & Demetrovics, 2011; Krohne, Egloff, Kohlmann, & Tausch, 1996; Melvin & Molloy, 2000; Robles & Páez, 2003; Terracciano, McCrae, & Costa, 2003).

Similar evidence concerning the universality of implicit affect is missing. One might expect that due to the fact that both the impulsive and reflective systems access the same affective experience, implicit affect and explicit affect should share the same universal characteristics. Yet, it remains unknown whether the IPANAT scores would reflect this universality. Therefore, we conducted the present study to assess the internal consistency, construct validity, and cross-cultural factorial invariance of the IPANAT across various countries. To that aim, we coordinated a common study design with five teams from different countries (Austria, Poland, Russia, the USA, and Uzbekistan). Another five teams (from China, Italy, Mexico, the Netherlands, and Switzerland) had previously collected some data on the IPANAT. Because these studies provide translations of the scale and the data are informative we additionally included these data in our analyses, although the designs of these studies somewhat differed from the coordinated design.

Table 1. Demographic characteristics of the samples

	n	Gender			Age (years)	
		% Women	% Men	% Missing	M	SD
Austria	115	62.6	37.4	–	30.69	11.42
China	289	69.6	28.4	2.0	20.49	1.72
Italy	955	51.0	48.5	0.5	29.51	6.71
Mexico	119	85.7	14.3	–	21.78	5.50
The Netherlands	1,123	85.6	10.8	3.6	46.29	10.92
Poland	288	80.2	19.8	–	22.13	3.53
Russia	513	76.8	21.2	1.9	21.15	6.21
Switzerland	57	82.5	17.5	–	21.95	5.01
USA	128	70.3	29.7	–	18.91	1.06
Uzbekistan	168	57.7	41.1	1.2	22.49	5.77
Total sample	3,755	71.4	26.9	1.7	30.95	12.98

Based on the previous findings by Quirin, Kazén, and Kuhl (2009), we predicted that IPA and INA would represent two separate dimensions and that participants would score higher on IPA than on INA. Moreover, we expected that the IPANAT scores would be relatively stable over time, thereby, besides a state component, they would reflect a trait component of implicit affect as well. We also hypothesized that the structure of the IPANAT would be cross-culturally invariant and that IPA would be positively related to explicit positive affect, whereas INA would be positively related to explicit negative affect.

Materials and Method

Participants

The total sample ($N = 3,755$) consisted of participants from Austria, China, Italy, the Netherlands, Mexico, Poland, Russia, Switzerland, the USA, and Uzbekistan. Of these participants, 2,682 (71.4%) were women, 1,009 (26.9%) were men, and 64 (1.7%) did not report their gender. The number of participants, percentage of men and women, and mean age for each country are reported in Table 1. Both the proportion of men and women, $\chi^2(9) = 414.02$, $p < .001$, $V = .33$, and mean age differed significantly, $F(9, 3,688) = 746.26$, $p < .001$, $\eta^2 = .65$, across countries.

Procedure

The IPANAT instruction and mood adjectives were translated from English or German into the local languages (see Table 2). In all samples the translation procedures were carried out by native speakers with a fluent command of German or English. In the Netherlands, Mexico, Poland, Russia, and Uzbekistan the translations were additionally evaluated by a group of at least three judges who rated the clarity of the instructions and the understandability of

Table 2. Mood adjectives used in different languages

Original mood adjectives	Happy	Cheerful	Energetic	Helpless	Tense	Inhibited
Austria	gut gelaunt	fröhlich	aktiv	hilflos	verkrampft	gehemmt
China	快乐的	兴高采烈的	精神充沛的	无助的	紧张的	羞怯的
Italy	felice	allegro	energico	impotente	nervoso	inibito
Mexico	feliz	alegre	activo	desamparado	tenso	inhibido
The Netherlands	goedgehumeurd	vrolijk	actief	hulpeloos	gespannen	geremd
Poland	zadowolony	radosny	pełen energii	bezradny	spięty	zahamowany
Russia/Uzbekistan	счастливый	радостный	энергичный	беспомощный	напряженный	заторможенный
Switzerland	heureux	joyeux	plein d'énergie	désespéré	tendu	inhibé
USA	happy	cheerful	energetic	helpless	tense	inhibited

Note. The full version of the IPANAT can be found in Quirin, Kazén, and Kuhl (2009).

the adjectives. Moreover, the teams from the Netherlands and Poland developed new sets of artificial words following the procedure by Quirin, Kazén, and Kuhl (2009) because the original words turned out to bear too much affective meaning for Polish and Dutch language users.[2]

Participants were recruited via e-mailing lists, leaflets, social networking services, and word-of-the-mouth advertising. All data were collected either via paper-and-pencil or web-based surveys. The former procedure was applied in Austria, China, Mexico, the Netherlands, Russia, Uzbekistan, and the USA, whereas the latter in Italy and Switzerland. In Poland both methods were used. The majority of participants (*n* = 211) were administered paper-and-pencil measures, whereas the other (*n* = 77) were tested via the Internet. In all samples the IPANAT was administered as the first measure in order not to raise expectations that the test measures affect. Having completed the IPANAT, participants assessed their explicit affect and answered demographic questions. In three countries we also collected the data on time stability of the IPANAT. In Austria (*n* = 115) the test was administered two more times (after one-week and after four-week intervals), whereas in Poland (*n* = 119) and Mexico (*n* = 101) one more time (after 4 weeks and after 30 min, respectively).

Measures

Explicit positive affect (EPA) and explicit negative affect (ENA) were assessed with three different yet related instruments. In the samples from the five start-up studies (Austria, Poland, Russia, Uzbekistan, and the USA) we asked participants to indicate how they felt *in general*. Participants of the Chinese and Italian samples rated their affective states within *last week* or *last month*, respectively,

whereas in Mexico and Switzerland participants rated their *momentary* affective state. The Dutch team did not collect data on explicit affect. In the majority of countries we used the local versions of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988)[3] which is a widely applied 20-item self-report measure of affective states and traits. The items were scored on a 5-point scale from 1 (= *very slightly or not at all*) to 5 (= *extremely*). In the Mexican sample, EPA and ENA were measured with the same mood adjectives as included in the IPANAT. Participants were asked to report the extent to which they felt happy, cheerful, energetic, helpless, tense, and inhibited on a rating scale from 1 (= *not at all*) to 4 (= *completely*). By analogy to the IPANAT, we composed EPA and ENA scales computing average scores for positive adjectives and negative adjectives, respectively. In Poland both the PANAS and mood adjectives were used (in two independent samples). Finally, in Switzerland the short form of the hedonic tone scale of the UWIST Mood Adjective Checklist (Matthews, Jones, & Chamberlain, 1990) translated into French was applied. The scale has been reported to correlate positively with energetic arousal and negatively with tense arousal (Matthews et al., 1990). Participants reported how they felt right now on a rating scale from 1 (= *not at all*) to 7 (= *very much*).

Results

Descriptive Statistics, Intercorrelations, Internal Consistency, and Time Stability

Descriptive statistics for IPA and INA are reported in Table 3. The kurtosis and skewness values indicated that

---

[2] Polish artificial words were: KOFGE, BASDI, MIKUF, LOPEW, AHYKO, and CEMJU. Dutch artificial words were: TOMAK, RAKEG, NABEN, HASWI, POGIS, and TEKOD.

[3] Chinese version: Qiu, Zheng, and Wang (2008); Italian version: Terracciano et al. (2003); German version: Krohne, Egloff, Kohlmann, and Tausch (1996); Polish version: Brzozowski (2010); Russian version: Osin (2012).

Table 3. Mean scores and Cronbach's α of IPA and INA

| Countries | Scales | Cronbach's α | M | SD | Min | Max | Skewness | Kurtosis | Differences between mean IPA and INA | | | | IPA and INA correlation | |
									t	df	p	Cohen's d	r	r_partial
Austria	IPA	.78	2.34	0.42	1.22	3.83	−.40	1.48	6.87	114	.001	1.29	−.03 (ns)	.08 (ns)
	INA	.86	1.94	0.45	1.00	3.56	.22	0.51						
China	IPA	.79	2.10	0.44	1.11	3.83	.02	0.21	4.19	288	.001	0.49	.25***	.01 (ns)
	INA	.85	1.97	0.45	1.00	3.83	.20	0.21						
Italy	IPA	.88	1.86	0.49	1.00	4.00	.78	1.27	9.19	940	.001	0.60	.57***	.18***
	INA	.81	1.73	0.44	1.00	4.00	.66	0.77						
Mexico	IPA	.81	2.27	0.47	1.22	3.61	.40	0.18	7.40	118	.001	1.36	.14 (ns)	−.10 (ns)
	INA	.78	1.87	0.43	1.00	3.17	.51	0.11						
The Netherlands	IPA	.89	2.08	0.49	1.00	4.00	.76	1.56	4.29	1097	.001	0.26	.12***	.02 (ns)
	INA	.86	2.00	0.45	1.00	4.00	.59	1.21						
Poland	IPA	.83	2.32	0.40	1.17	3.61	−.06	0.46	3.46	287	.001	0.41	.02 (ns)	−.02 (ns)
	INA	.76	2.21	0.39	1.22	3.56	.04	0.45						
Russia	IPA	.83	2.25	0.48	1.00	3.73	−.05	0.01	7.55	510	.001	0.67	.05 (ns)	.05 (ns)
	INA	.69	2.04	0.42	1.00	3.07	−.05	−0.40						
Switzerland	IPA	.72	2.23	0.38	1.50	3.00	.01	−0.70	4.21	56	.001	1.13	.08 (ns)	.05 (ns)
	INA	.65	1.96	0.35	1.33	2.83	.21	−0.53						
USA	IPA	.85	2.03	0.37	1.28	3.17	.40	−0.05	1.29	127	.198	0.23	.25**	.13 (ns)
	INA	.82	1.98	0.36	1.11	2.83	−.09	−0.53						
Uzbekistan	IPA	.75	2.18	0.47	1.00	3.47	−.08	−0.14	3.78	164	.001	0.59	.28***	.17*
	INA	.67	2.02	0.41	1.00	3.13	−.12	−0.18						

Notes. Partial correlation coefficients were computed using *energetic* and *tense* as controls. *p < .05; **p < .01; ***p < .001.

the scores tended to be normally distributed in the majority of samples. In all but one sample, participants reported significantly higher mean levels of IPA than INA, which suggested that on average they tended to judge artificial words as conveying more positive than negative meaning. The only exception was the American sample where no significant differences between mean IPA and INA scores were observed (although numerically IPA scores were higher than INA scores). Consistent with our predictions, in the Austrian, Mexican, Polish, Russian, and Swiss samples, IPA and INA were unrelated. In China, Italy, the Netherlands, the USA, and Uzbekistan, however, we observed unexpected positive correlations between IPA and INA. Nevertheless, after controlling for two arousal-related adjectives, namely *energetic* and *tense*, these IPA-INA correlations dropped to nonsignificance (in the Chinese, Dutch, and American samples) or became significantly weaker (in the Italian sample; Z = 10.16; p < .001). The only exception was the Uzbek sample where no significant decrease of the correlation coefficient was observed, Z = 1.05; p = .292.

Gender differences were significant neither for IPA nor for INA (ts < 1.80; ps > .10) with the exception of the Italian sample, where women scored higher on the IPA scale than men t(934) = 2.07; p = .039; and the Swiss sample where women scored lower on the INA scale than men, t(55) = −2.17; p = .034. Yet, these differences represented small- (Cohen's d = .14) and medium-sized effects (d = .58), respectively.

The internal consistencies, using Cronbach's alphas, ranged across countries from .72 to .89 for IPA and from .67 to .86 for INA (see Table 3). In Austria, China, Italy, Mexico, the Netherlands, Poland, and the USA, the coefficients were similar to those found in the German sample (Quirin, Kazén, & Kuhl, 2009), whereas in Russia, Switzerland, and Uzbekistan, they were somewhat lower but still acceptable. Additionally, on the basis of the data collected in the Austrian (n = 115), Mexican (n = 119), and Polish samples (n = 101), we computed test-retest reliabilities. In Austria the correlations between the scores were .57 for IPA and .65 for INA (across a one-week interval) and .55 for IPA and .60 for INA (across a four-week interval). In Poland the test-retest correlations were .68 for IPA and .67 for INA (across four weeks), whereas in Mexico they were .74 for IPA and .69 for INA (across 30 min). Overall, these results confirm that the IPANAT scores are psychometrically solid and predominantly reflect a stable, trait component of positive and negative affect.

Cross-Cultural Measurement Invariance

To investigate the measurement equivalence (i.e., the equality of factor loadings, item intercepts, and residual variances) of the IPANAT across diverse cultures, we performed a multiple group confirmatory factor analysis (MG-CFA; Mplus 6.1; Muthén & Muthén, 2010). Specifically, we analyzed (a) weak (metric) invariance (the equality

Table 4. CFA of bi-factorial model of the IPANAT by country

Countries	CFI	TLI	RMSEA	χ^2	df	p	χ^2/df ratio
Austria	1	1	< .05	6.40	8	ns	0.80
China	0.99	0.98	.03	10.39	8	ns	1.30
Italy	0.99	0.97	.05	29.79	8	< .001	3.72
Mexico	1	1	< .05	7.51	8	ns	0.94
The Netherlands	0.98	0.96	.07	55.48	8	< .001	6.93
Poland	1	1	< .05	7.35	8	ns	0.92
Russia	0.98	0.97	.06	20.65	8	< .001	2.58
Switzerland	0.69	0.42	.22	30.94	8	< .001	3.87
The USA	0.99	0.97	.06	11.17	8	ns	1.39
Uzbekistan	0.95	0.91	.11	22.95	8	< .001	2.87

Table 5. Goodness-of-fit indices – test of invariance of three nested models

	CFI	TLI	RMSEA	DIFF TEST		
				χ^2	df	p
Model 1	.98	.97	.06	–	–	–
Model 2	.98	.98	.05	51.06	32	.018
Model 3	.92	.91	.10	573.824	32	< .001

Note. Model 1 – free loadings, free intercepts, and free uniqueness; *Model 2* – free intercepts and free uniqueness; *Model 3* – free uniqueness.

of factor loadings across groups), (b) strong (scalar) invariance (the equality of item intercepts across groups), and (c) – if metric and scalar invariance was achieved – strict invariance (the equality of item residuals across groups; Byrne, Shavelson, & Muthén, 1989).

The invariance across groups was tested according to Muthén and Muthén (2009, 2010). First, a confirmatory factor analysis (CFA) was conducted on the overall sample and on each country individually. Then, three nested models were compared: *model 1* with free loadings, intercepts, and residual variances (i.e., none of the three parameters were considered invariant); *model 2*, where only the loadings were constrained and held equal across countries (metric invariance); and *model 3*, with loadings and intercepts held equal across countries (metric and scalar invariance). The χ^2 of the nested models (*model 1* vs. *model 2*, and *model 2* vs. *model 3*) were compared using the DIFFTEST option. We used the maximum likelihood parameter estimates with standard errors and a mean- and variance-adjusted χ^2 test statistic that are robust to non-normality (MLMV; Muthén & Muthén, 2010).

The CFA as ran on the overall sample confirmed the goodness of fit of the model (CFI = .99; TLI = .98, RMSEA = .046, χ^2/df = 8.77), nonetheless the χ^2/df ratio was over the cutoff of 3.0. Hence, we decided to test the model fit within each country separately (see Table 4).

The results presented in Table 4 show that the bi-factorial model was confirmed in all countries except for Switzerland. Therefore, we tested invariance after excluding the Swiss sample (see Table 5). The DIFFTEST suggests that constraining the factor loadings in *model 2* and the loadings and intercepts in *model 3* worsened the model fit significantly (as compared to *model 1* in which the parameters were unconstrained). However, CFI, TLI, and RMSEA of *model 2* slightly improved. Constraining the intercepts (*model 3*) resulted in poor goodness-of-fit indices.

Because the model was not fully invariant across the analyzed countries we proceeded with the test of partial invariance, in which a subset of the parameters was not constrained to be invariant (Muthén & Muthén, 2009).

The modification indices in *model 2* suggest that residuals' covariance between *energetic* and *tense* in the Dutch sample may improve the fit, which was confirmed in a further analysis (CFI = .98, TLI = .98, RMSEA = .048, DIFFTEST: χ^2 = 21.06, *df* = 31, *p* = .91; cf. the fit of nested *models 1* and *2* in Table 5). Thus, *model 3* was run including the covariance as in *model 2*. Modification indices > 50 suggest that freeing the intercepts of *helpless* in China, Poland, and Uzbekistan, as well as *helpless* and *tense* in Russia would improve the fit (all the other intercepts were still held equal across countries). Although the indices improved significantly, the DIFFTEST was still statistically significant (CFI = .97, TLI = .96, RMSEA = .064, DIFFTEST: χ^2 = 192.52, *df* = 27, *p* < .001; cf. the fit of nested *models 2* and *3* in Table 5), which suggests that the item intercepts cannot be considered invariant. Thus, because scalar invariance was not confirmed we did not test strict invariance, that is the equality of variance residuals (Byrne et al., 1989).

In sum, following Muthén and Muthén (2009), who suggested that invariance of intercepts is quite difficult to achieve, we conclude that the IPANAT is metrically invariant across countries (except for Switzerland), albeit we failed to achieve scalar invariance. In other words, factor loadings are the same across countries (in a way that relationships between IPA, INA, and other constructs can be examined cross-culturally), but the countries cannot be compared in terms of the IPANAT mean scores.

Convergent and Discriminant Validity

Table 6 presents Pearson's correlations of IPA and INA with explicit affect. As expected according to previous findings (Quirin, Kazén, & Kuhl, 2009), in the majority of samples IPA was positively related to EPA and unrelated to ENA, whereas INA was positively related to ENA and unrelated to EPA. The only exceptions were the Austrian and Uzbek samples, in which some links were only marginally significant, and the Italian and Chinese samples, in which positive correlations between INA and EPA were observed. These correlations, however, turned out to be nonsignificant after controlling for *tense* and *energetic* (in the Chinese sample: $r_{partial}$ (285) = −.06; *p* = .328; in the Italian

Table 6. Pearson's correlations between implicit and explicit affect

Explicit affect	Countries	n	IPA		INA	
			r	p	r	p
EPA (PANAS)	Austria	115	.16	.084	.08	.374
	China	289	.21	<.001	.15	.012
	Italy	939	.17	<.001	.08	.009
	Poland	77	.38	<.001	−.05	.640
	Russia	511	.17	<.001	.02	.790
	USA	128	.27	.002	.14	.110
	Uzbekistan	165	.14	.068	−.03	.752
EPA (same adjectives)	Mexico	114	.33	<.001	−.11	.230
	Poland	211	.14	.037	−.11	.125
ENA (PANAS)	Austria	115	.01	.887	.18	.054
	China	289	.06	.309	.28	<.001
	Italy	939	.01	.887	.16	<.001
	Poland	77	−.03	.775	.21	.066
	Russia	511	.03	.524	.22	<.001
	USA	128	.02	.824	.22	.012
	Uzbekistan	165	.08	.301	.21	.008
ENA (same adjectives)	Mexico	114	−.11	.263	.32	.001
	Poland	211	−.08	.259	.14	.049
Hedonic tone (UMACL)	Switzerland	57	.30	.024	.24	.072

Notes. The Netherlands is not listed because we did not measure explicit affect in this sample.

sample: $r_{partial}$ (931) = .04; p = .201. Additionally, in the Swiss sample, hedonic tone was positively linked to both IPA and INA. Yet, the correlation with INA reached only marginal significance and dropped to non-significance when *tense* was controlled for, $r_{partial}$ (57) = −.07, p = .598.

Discussion

The aim of the present research was to assess psychometric properties of the IPANAT across various cultural contexts. The results of the studies conducted in Austria, China, Italy, Mexico, the Netherlands, Poland, Russia, Switzerland, the United States, and Uzbekistan confirm that the IPANAT is able to measure implicit affect in various countries and languages.

The IPANAT scales have good internal consistency (for IPA and INA about .81 and .78, respectively) that is comparable to or even higher than the reliability of other commonly used implicit measures (Fazio & Olson, 2003; Krause, Back, Egloff, & Schmukle, 2011) and only somewhat lower than the reliability of self-report mood scales (e.g., PANAS or UMACL). The IPANAT scores are also quite stable over time, which confirms that the test is suitable for assessing positive and negative affect treated as relatively stable personality characteristics (positive and negative affectivity; Watson, 2000). At the same time, moderate test-retest correlations suggest that the IPANAT scores reflect not only trait but also state variance.

In line with previous studies (Quirin, Kazén, & Kuhl, 2009; De Visch, 2012), the present research also revealed that people from different countries tend to attribute more positive than negative meaning to the artificial words used in the IPANAT. This result not only reflects a so-called "positivity offset" (Cacioppo & Berntson, 1994) but also corresponds with the observation that most of the time people experience pleasant rather than unpleasant affective states (Watson, 2000). The current research extends the validity of this observation beyond explicit affect. Moreover, the IPANAT scales are either unrelated or weakly related to participants' gender, which is consistent with the studies showing that men and women report similar levels of explicit positive and negative affect (Watson, 2000; Watson & Clark, 1994).

Although in some of the samples IPA and INA were unrelated, in other countries an unexpected positive correlation between these two dimensions was observed. As this relationship appears to differ across cultures, we cannot exclude that it is affected by cultural factors. For instance, one of the reasons why independence between two scales may shift toward positive correlation is acquiescence (Paulhus & Vazire, 2007). It has been found that this response bias exerts moderate influence on explicit affect ratings (Diener, Smith, & Fujita, 1995; Watson, 2000). Moreover, it differs across countries. Specifically, it has been observed more often in collectivist, large-power-distance cultures than individualist, small-power-distance ones (Johnson, Kulesa, Cho, & Shavitt, 2005; Van Herk, Poortinga, & Verhallen, 2004). In our research, however, only two samples in which IPA and INA were positively correlated are marked by collectivism and large power distance (China, Uzbekistan). The rest of the samples in which we observed a positive IPA-INA correlation (Italy, the Netherlands, the USA) are characterized by high individualism and small power distance (Hofstede, Hofstede, & Minkov, 2010). Therefore, the differences in relationship between IPA and INA across the samples probably arise from other reasons.

One of these reasons may be that various cultures attribute slightly different meaning to mood adjectives, as it has already been found for some adjectives referring to personality (Nye, Roberts, Saucier, & Zhou, 2008). When subjected to confirmatory factor analysis (CFA), the IPANAT failed to show scalar invariance, which implies that individuals in one sample may score differently on some items than individuals in another sample because of the way they conceptualize the meaning of these items and not because of true mean differences. In addition, the analysis of partial correlations showed that two adjectives, namely *energetic* and *tense*, could be responsible for the IPA-INA correlation in some samples. A closer examination of the connotations of these two adjectives suggests that they may share a

common semantic component as they are both associated with activation or arousal (Thayer, 1996, 2001; Yik et al., 2011). Thus, it is possible that in some countries these two items may overlap although they originate from separate subscales. Even though currently it is difficult to explain what specific cultural factors are responsible for this overlap, this finding points out to the importance of subtle differences in the conceptualizations of positivity and negativity that may appear across cultures. For instance, when validating the short form of the PANAS in the Australian sample, Mackinnon et al. (1999) found that the item *excited* significantly correlated with both EPA and ENA. Moreover, the pleasure-displeasure dimension of Russell's (1980) circumplex model has been replicated across cultures, whereas its arousal dimension has not consistently emerged in data (Russell, Lewicka, & Niit, 1989). This suggests that in some cultures certain mood adjectives – especially those associated with activation or arousal – may carry ambiguous meaning (see also Thompson, 2007). It seems likely that the IPANAT may be more sensitive to weak differences in meaning of mood adjectives than explicit measures.

The correlations of the IPANAT scores with the PANAS and other explicit affect scales support this conclusion. The examples of the Chinese, Italian, and Swiss samples suggest that *tense* and *energetic* should be controlled for when analyzing the relationship between implicit and explicit positive affect. Consequently, the possibility of comparing the means of the IPANAT across various countries is reduced as the discrepancies observed across various samples may in fact result from different conceptualizations of mood adjectives that refer to activation or arousal. Thus, it remains an open question whether (and if so, to what extent) the level of implicit positive and negative affect differs across countries. Nevertheless, the test showed good fit tested both in the overall sample encompassing many different countries (and languages) and in each sample separately. Moreover, in the multiple-group analysis, the metric invariance was achieved, which implies that the two factors (IPA and INA) can be tested in relation to other constructs cross-nationally.

In two samples (Italian and Swiss) we did not find support for the separability of the IPANAT subscales. In the Italian sample the positive correlation between IPA and INA was higher than in other samples (where it was consistently nonsignificant or low), whereas in the Swiss sample the two-dimensional model of affect was not confirmed in the CFA. Importantly, in these two samples but not in the other samples the IPANAT was filled out exclusively online, which suggests that Internet-based administration might have influenced the results. This explanation is in line with the fact that we found gender differences in the IPANAT scores only in these two samples (although such differences did not appear in the rest of the countries). It is known that

gender can affect web-based surveys to a greater extent than paper-and-pencil ones (Kay, Gathercoal, & Buhrow, 2011). Additionally, it cannot be excluded that Internet-based administration of the IPANAT results in so-called "careless responding" (Johnson, 2005; Ward & Pond, 2013), which refers to the situation in which participants respond to a survey in a manner that does not reflect their true scores. Careless responding may occur when the researcher and participant are physically disconnected, which is inherent to web-based survey research (Ward, 2015). At the moment, however, it is impossible to say whether the IPANAT scores were influenced by the web-based research format (e.g., in the part of the Polish sample, where we also used an Internet-based survey, we found neither positive IPA-INA correlation nor gender differences). Nevertheless, this issue should be investigated more thoroughly in the future.

Finally, some limitations of the present research should be mentioned. We cannot rule out that differences in procedures applied in the countries involved in the project contributed to some of the observed discrepancies. First, as we have already mentioned the data in all 10 samples were collected either via paper-and-pencil or the Internet, which might have influenced the results. Thus future research would benefit from comparing these two alternative survey formats of the IPANAT more systematically. Second, there were demographic dissimilarities across samples and women were overrepresented in almost all of them. Although in eight out of 10 samples we found no gender effects, the examples of the Italian and Swiss samples show that the relation between gender and implicit affect should be analyzed more carefully in the future. Third, explicit measures of affect we used differed across samples in terms of the time frames involved (starting from momentary affect and ending with relatively stable affectivity). This could have influenced the relationship between implicit and explicit affect as the IPANAT has a strong trait component (Quirin, Kazén, & Kuhl, 2009, Quirin, Kazén, Rohrmann, et al., 2009). Future studies would thus benefit from analyzing the relationship between implicit and explicit state affect as well as implicit and explicit trait affect more thoroughly.

Overall, the present research supports the reliability and construct validity of the IPANAT demonstrating that implicit affect can be successfully measured in various cultural contexts. The IPANAT fills the need for a measure that assesses affect in an indirect instead of direct way. Therefore, it enables researchers based in different countries to investigate the discrepancies between explicit and implicit affect and their correlates. Measuring affect on a variety of levels (explicit, implicit, and psychophysiological) provides a better understanding of a range of psychological processes, as it has been already demonstrated for cortisol

regulation (Quirin, Kazén, Rohrmann, et al., 2009), repeated subliminal exposure (Hicks & King, 2011), or analytic versus holistic processing (Kazén et al., 2014). Moreover, the ease of use of the IPANAT opens up possibilities for applying similar procedures to other types of emotional constructs, such as implicit motives, or implicit prejudice (Quirin, Kuhl, Luckey, Pyszczynski, & Bode, 2014).

Acknowledgments

References

Almagor, M., & Ben-Porath, Y. S. (1989). The 2-factor model of self-reported mood: A cross-cultural replication. *Journal of Personality Assessment, 53*, 10–21.

Ayuso-Mateos, J. L., Miret, M., Caballero, F. F., Olaya, B., Haro, J. M., Kowal, P., & Chatterji, S. (2013). Multi-country evaluation of affective experience: Validation of an abbreviated version of the Day Reconstruction Method in seven countries. *PLoS One, 8*, e61534.

Barrett, L. F., Robin, L., Pietromonaco, P. R., & Eyssell, K. M. (1998). Are women the "more emotional" sex? Evidence from emotional experiences in social context. *Cognition and Emotion, 12*, 555–578.

Bartoszek, G. (2009). *Implicit measure of emotions: Distinguishing among emotions of the same valence*, Chicago, IL: University of Illinois. Retrieved from http://indigo.uic.edu/bitstream/handle/10027/9163/Bartoszek_Greg-ory.pdf?sequence=1

Bosson, J. K., Swann, W., & Pennebaker, J. W. (2000). Stalking the perfect measure of implicit self-esteem: The blind men and the elephant revisited? *Journal of Personality and Social Psychology, 79*, 631–643.

Brzozowski, P. (2010). *Skala uczuć pozytywnych i negatywnych (SUPIN). Polska adaptacja PANAS* [Positive and Negative Affect Scales: The Polish adaptation]. Warsaw, Poland: Pracownia Testów Psychologicznych.

Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105*, 456–466.

Cacioppo, J. T., & Berntson, G. G. (1994). Relationship between attitudes and evaluative space: A critical review, with emphasis on the separability of positive and negative substrates. *Psychological Bulletin, 115*, 401–423.

Cacioppo, J. T., & Berntson, G. G. (1999). The affect system: Architecture and operating characteristics. *Current Directions in Psychological Science, 8*, 133–137.

Church, A. T., Alvarez, J. M., Mai, N. T. Q., French, B. F., Katigbak, M. S., & Ortiz, F. A. (2011). Are cross-cultural comparisons of personality profiles meaningful? Differential item and facet functioning in the Revised NEO Personality Inventory. *Journal of Personality and Social Psychology, 101*, 1068–1089.

Costa, P. T. Jr., Terracciano, A., & McCrae, R. R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology, 81*, 322–331.

Crawford, J. R., & Henry, J. D. (2004). The positive and negative affect schedule (PANAS): Construct validity, measurement properties and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 43*, 245–265.

De Houwer, J., Teige-Mocigemba, S., Spruyt, A., & Moors, A. (2009). Implicit measures: A normative analysis and review. *Psychological Bulletin, 135*, 347–368.

De Visch, K. (2012). *The significance of hidden feelings*, Validation of the IPANAT in two samples and its relationship with creativity. Ghent, Belgium: Ghent University. Retrieved from http://lib.ugent.be/fulltxt/RUG01/001/893/964/RUG01- 001893964_2012_0001_AC.pdf

Diener, E., Smith, H., & Fujita, F. (1995). The personality structure of affect. *Journal of Personality and Social Psychology, 69*, 130–141.

Fabes, R. A., & Martin, C. L. (1991). Gender and age stereotypes of emotionality. *Personality and Social Psychology Bulletin, 17*, 532–540.

Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology, 69*, 1013–1027.

Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology, 54*, 297–327.

Feldman Barrett, L., & Russell, J. A. (1998). Independence and bipolarity in the structure of current affect. *Journal of Personality and Social Psychology, 74*, 967–984.

Forgas, J. P. (1995). Mood and judgment: The affect infusion model (AIM). *Psychological Bulletin, 117*, 39–66.

Forgas, J. P., & Bower, G. H. (1998). Affect in social judgments. *Australian Journal of Psychology, 81*, 1001–1013.

Gaudreau, P., Sanchez, X., & Blondin, J. (2006). Positive and negative affective states in a performance-related setting: Testing the factorial structure of the PANAS across two samples of French-Canadian participants. *European Journal of Psychological Assessment, 22*, 240–249.

Gyollai, A., Simor, P., Köteles, F., & Demetrovics, Z. (2011). Psychometric properties of the Hungarian version of the original and the short form of the Positive and Negative Affect Schedule (PANAS). *Neuropsychopharmacologia Hungarica, 13*, 73–79.

Hass, R. G., Katz, I., Rizzo, N., Bailey, J., & Moore, L. (1992). When racial ambivalence evokes negative affect, using a disguised measure of mood. *Personality and Social Psychology Bulletin, 18*, 786–797.

Hicks, J. A., & King, L. A. (2011). Subliminal mere exposure and explicit and implicit positive affective responses. *Cognition and Emotion, 25*, 726–729.

Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005). A meta-analysis on the correlation between the Implicit Association Test and explicit self-report measures. *Personality and Social Psychology Bulletin, 31*, 1369–1385.

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and Organizations: Software of the Mind* (3rd ed.). Columbus, OH: McGraw-Hill.

Humrichouse, J., Chmielewski, M., McDade-Montez, E. A., & Watson, D. (2007). Affect assessment through self-report methods. In J. Rottenberg & S. L. Johnson (Eds.), *Emotion and psychopathology: Bridging affective and clinical science* (pp. 13–34). Washington, DC: American Psychological Association.

Johnson, J. A. (2005). Ascertaining the validity of individual protocols from Web-based personality inventories. *Journal of Research in Personality, 39*, 103–129.

Johnson, T., Kulesa, P., Cho, Y. I., & Shavitt, S. (2005). The relation between culture and response styles. Evidence from 19 countries. *Journal of Cross-Cultural Psychology, 36*, 264–277.

Kay, K., Gathercoal, K., & Buhrow, W. (2011). Does survey format influence self-disclosure on sensitive question items? *Computers in Human Behavior, 28*, 251–256.

Kazén, M., Kuhl, J., & Quirin, M. (2014). Personality interacts with implicit affect to predict performance in analytic vs. holistic processing. *Journal of Personality*. Advance online publication. doi: 10.1111/jopy.12100

Krause, S., Back, M. D., Egloff, B., & Schmukle, S. C. (2011). Reliability of implicit self-esteem measures revisited. *European Journal of Personality, 25*, 239–251.

Krohne, H. W., Egloff, B., Kohlmann, C.-W., & Tausch, A. (1996). Untersuchungen mit einer deutschen Version der "Positive and Negative Affect Schedule" (PANAS) [Investigations with a German version of the "Positive and Negative Affect Schedule" (PANAS)]. *Diagnostica, 42*, 139–156.

Langens, T. A. (2002). Tantalizing fantasies: Positive imagery induces negative mood in individuals high in fear of failure. *Imagination, Cognition, and Personality, 21*, 281–292.

Larsen, J. T., McGraw, A. P., & Cacioppo, J. T. (2001). Can people feel happy and sad at the same time? *Journal of Personality and Social Psychology, 81*, 684–696.

Leventhal, H., & Scherer, K. (1987). The relationship of emotion to cognition: A functional approach to a semantic controversy. *Cognition and Emotion, 1*, 3–28.

Mackinnon, A., Jorm, A. F., Christensen, H., Korten, A. E., Jacomb, P. A., & Rodgers, B. (1999). A short form of the positive and negative affect schedule: Evaluation of factorial validity and invariance across demographic variables in a community sample. *Personality and Individual Differences, 27*, 405–416.

Matthews, G., Jones, D. M., & Chamberlain, A. G. (1990). Refining the measurement of mood: The UWIST Mood Adjective Checklist. *British Journal of Psychology, 81*, 17–42.

Melvin, G. A., & Molloy, G. N. (2000). Some psychometric properties of the Positive and Negative Affect Schedule among Australian youth. *Psychological Reports, 86*, 1209–1212.

Merz, E. L., Malcarne, V. L., Roesch, S. C., Ko, C. M., Emerson, M., Roma, V. G., & Sadler, G. R. (2013). Psychometric properties of Positive and Negative Affect Schedule (PANAS) original and short forms in an African American community sample. *Journal of Affective Disorders, 151*, 942–949.

Muthén, L. K., & Muthén, B. O. (2009). *Exploratory factor analysis, confirmatory factor analysis, and structural equation modeling for continuous outcomes*. Retrieved from https://www.statmodel.com/download/Topic%201.pdf

Muthén, L. K., & Muthén, B. O. (2010). *Mplus User's Guide* (Sixth Edition). Los Angeles, CA: Muthén & Muthén.

Nye, C. D., Roberts, B. W., Saucier, G., & Zhou, X. (2008). Testing the measurement equivalence of personality adjective items across cultures. *Journal of Research in Personality, 42*, 1524–1536.

Oatley, K., & Duncan, E. (1994). The experience of emotions in everyday life. *Cognition & Emotion, 8*, 369–381.

Osin, N. E. (2012). Izmerenie pozitivnykh i negativnykh emotcii: razrabotka russkoiazychnogo analoga metodiki PANAS [Measuring Positive and Negative Affect: Development of a Russian Version of PANAS]. *The Psychology. Journal of Higher School of Economics, 4*, 91–110.

Paulhus, D. L., & Vazire, S. (2007). The self-report method. In R. W. Robins, R. C. Fraley, & R. F. Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 224–239). New York, NY: Guilford.

Payne, B. K., Cheng, C. M., Govorun, O., & Stewart, B. D. (2005). An inkblot for attitudes: Affect misattribution as implicit measurement. *Journal of Personality and Social Psychology, 89*, 277–293.

Qiu, L., Zheng, X., & Wang, Y. (2008). Revision of the Positive Affect and Negative Affect Scale. *Chinese Journal of Applied Psychology, 14*, 249–254.

Quirin, M., & Bode, R. C. (2014). An alternative to self-reports of trait and state affect: The Implicit Positive and Negative Affect Test (IPANAT). *European Journal of Psychological Assessment, 30*, 231–237.

Quirin, M., Kazén, M., & Kuhl, J. (2009). When nonsense sounds happy or helpless: The Implicit Positive and Negative Affect Test (IPANAT). *Journal of Personality and Social Psychology, 97*, 500–516.

Quirin, M., Kazén, M., Rohrmann, S., & Kuhl, J. (2009). Implicit but not explicit affectivity predicts circadian and reactive cortisol: Using the Implicit Positive and Negative Affect Test. *Journal of Personality, 77*, 401–425.

Quirin, M., Kuhl, J., Luckey, U., Pyszczynski, T. A., & Bode, R. (2014). Profound versus superficial coping with mortality threats: Action orientation moderates implicit but not explicit outgroup prejudice. *Personality and Social Psychology Bulletin*. Advance online publication. doi: 10.1177/0146167214536928

Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: Evidence for an accessibility model of emotional self-report. *Psychological Bulletin, 128*, 934–960.

Robles, R., & Páez, F. (2003). Estudio sobre la traducción al español y las propiedades psicométricas de las escalas de afecto positivo y negativo (PANAS) [Study on the spanish translation and the psychometric properties of the Positive and Negative Affect Scales (PANAS)]. *Salud Mental, 26*, 69–75.

Russell, J. A. (1980). A Circumplex Model of Affect. *Journal of Personality and Social Psychology, 39*, 1161–1178.

Russell, J. A., Lewicka, M., & Niit, T. (1989). A cross-cultural study of a circumplex model of affect. *Journal of Personality and Social Psychology, 57*, 848–856.

Schmukle, S. C., Egloff, B., & Burns, L. R. (2002). The relationship between positive and negative affect in the Positive and Negative Affect Schedule (PANAS). *Journal of Research in Personality, 36*, 463–475.

Schultheiss, O. C., & Brunstein, J. C. (2001). Assessment of implicit motives with a research version of the TAT: Picture profiles, gender differences, and relations to other personality measures. *Journal of Personality Assessment, 77*, 71–86.

Selcuk, E., Zayas, V., Günaydin, G., Hazan, C., & Kross, E. (2012). Mental representations of attachment figures facilitate recovery following upsetting autobiographical memory recall. *Journal of Personality and Social Psychology, 103*, 362–378.

Shields, S. (2002). *Speaking from the Heart: Gender and the Social Meaning of Emotion*. Cambridge, UK: Cambridge University Press.

Shimoda, S., Okubo, N., Kobayashi, M., Sato, S., & Kitamura, H. (2014). An attempt to construct a Japanese version of the Implicit Positive and Negative Affect Test (IPANAT). *Japanese Journal of Psychology, 85*, 294–303.

Stieger, S., Voracek, M., & Nader, I. W. (2014). Parent-child proximity: Automatic cognitions matter. *Social Indicators Research, 119*, 967–978.

Strack, F., & Deutsch, R. (2004). Reflective and Impulsive Determinants of Social Behavior. *Personality and Social Psychology Review, 8*, 220–247.

Terracciano, A., McCrae, R. R., & Costa, P. T. Jr. (2003). Factorial and construct validity of the Italian Positive and Negative Affect Schedule (PANAS). *European Journal of Psychological Assessment, 19*, 131–141.

Thayer, R. E. (1996). *The origin of everyday moods: managing energy, tension, and stress*. New York, NY: Oxford University Press.

Thayer, R. E. (2001). *Calm energy*. New York, NY: Oxford University Press.

Thompson, E. R. (2007). Development and validation of an internationally reliable Short-Form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology, 32*, 519–542.

Van Herk, H., Poortinga, Y. H., & Verhallen, T. M. M. (2004). Response styles in rating scales: Evidence of method bias in data from six EU countries. *Journal of Cross-Cultural Psychology, 35*, 346–350.

Ward, M. K. (2015). Careless responding on internet-based surveys. *Observer, 28*. Retrieved from http://www.psychologicalscience.org/index.php/publications/observer/2015/february-15/careless-responding-on-internet-based-surveys.html

Ward, M. K., & Pond, S. B. (2013). Using virtual presence and survey instructions to minimize careless responding on Internet-based surveys. *Computers in Human Behavior, 48*, 554–568.

Watson, D. (2000). *Mood and Temperament*. New York, NY: Guilford.

Watson, D., & Clark, L. A. (1994). *The PANAS-X: Manual for the Positive and Negative Affect Schedule – Expanded Form*. Retrieved from: http://ir.uiowa.edu/cgi/viewcontent.cgi?article=1011&context=psychology_pubs

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063–1070.

Weinberger, J., Kelner, S., & McClelland, D. C. (1997). The effects of subliminal symbiotic stimulation on free-response and self-report mood. *Journal of Nervous and Mental Disease, 185*, 599–605.

Wittenbrink, B., Judd, C. M., & Park, B. (1997). Evidence for racial prejudice at the implicit level and its relationship to questionnaire measures. *Journal of Personality and Social Psychology, 72*, 262–274.

Yik, M., Russell, J. A., & Steiger, J. H. (2011). A 12-Point circumplex structure of core affect. *Emotion, 11*, 705–731.

Ziegler, M., & Bensch, D. (2013). Lost in translation: Thoughts regarding the translation of existing psychological measures into other languages. *European Journal of Psychological Assessment, 29*, 81–83.

Monika Wróbel
Institute of Psychology
University of Lodz
ul. Smugowa 10/12
91-433 Lodz
Poland
E-mail mwrobel@uni.lodz.pl