Development of the Finnish Measure of Positive and Negative Affect

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Abstract:
The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is a widely used self-report measure of positive affect (PA) and negative affect (NA) in clinical and research settings. To date no standardized measure of these constructs exists in Finnish. The current dissertation aimed to develop a Finnish measure of Positive and Negative Affect (FiPANA), similar to the PANAS. Translating the PANAS to Finnish would be insufficient, mainly because items have previously performed differently across cultures. First, the structure of self-reported general affect was examined. Data was collected online. The sample consisted of 863 self-reportedly healthy participants (79% women) ranging in age between 18 and 71 years (M = 26.45, SD = 8.15). Each participant rated the 60 double-back translated PANAS-X items (Watson & Clark, 1994) using state and trait instructions, and completed additional validity measures. Exploratory factor analyses (EFA) yielded oblique two-factor solutions, identified as PA and NA, in both state and trait data, supporting the conceptualization of self-reported affect as consisting of two practically independent affective dimensions in the current sample. Next, the ten strongest markers of PA and NA, respectively, across state and trait data were selected for the 20-item FiPANA. The FiPANA was found a valid and reliable measure of self-reported general affect. Due to the identified gender differences in both PA and NA-scale scores, both overall and gender-specific norms were produced.

Keywords: PANAS, Affect, Positive Affect, Negative Affect, Emotions, Exploratory Factor Analysis	
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Ämne: Psykologi
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Avhandlingens titel: Utveckling av ett finskspråkigt självskattningsformulär för mätning av positiv och negativ affekt
Handledare: Carina Saarela
Abstrakt: Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) är ett vedertaget självskattningsformulär, som mäter positiv affekt (PA) och negativ affect (NA), och används inom såväl klinisk verksamhet som forskning. Dock har standardiserade finskspråkiga versioner av testet saknats till detta dato. Syftet med avhandlingen var att utveckla en finskspråkig motsvarighet till PANAS, ”The Finnish Measure of Positive and Negative Affect” (FiPANA). En direkt översättning av PANAS till finska var inte möjlig, i och med att flera av PANAS termerna uppvisat tvärkulturella skillnader i tidigare studier. Därmed utgjorde undersökning av faktorstrukturen i självskattad generell affekt det första steget i avhandlingen. Data samlades in online. Samplet bestod av 863 svarspersoner (79% kvinnor) i åldrarna 18–71 (M = 26,45; SD = 8,15), varav alla uppgav sig vara friska. Varje svarsperson skattade de 60 översatta PANAS-X känslotermerna (Watson & Clak, 1994) två gånger, för att mäta såväl affektivt tillstånd som generella affektiva egenskaper. Termerna översattes med double-back-metod. De explorativa faktoranalyserna (EFA) resulterade i korrelerade tvåfaktorslösningar, både i data som mätte affektiva egenskaper och affektiva tillstånd. Faktorerna identifierades som PA och NA. Resultaten understödde konceptualiseringen av en tvådimensionell affektstruktur även i detta finskspråkiga sampel. I nästa steg av utvecklingen av FiPANA, valdes de 20 affektiva termerna, som hade de högsta laddningarna på PA och NA faktorerna i såväl tillstånds- som egenskaps-data. Den slutliga versionen av FiPANA visades vara ett validt och reliabelt test av självskattad generell affekt. I och med de identifierade könsskillnaderna, producerades både generella och könsspecifika normer för FiPANA.
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Appendix

1 Introduction

In research, data collection is always dependent on which methods of measurement are available. A common restricting factor that researchers outside the Anglo-American sphere often have to face, is the lack of translated standardized tests. Especially in countries with small populations and distinct languages, such as Finland, the resources for translating become proportionally smaller. In parallel, cross-cultural research has become increasingly important, making the availability of translated measures even more acute. The aim of this study was to develop a brief-format Finnish measure of positive and negative affect, similar to the 20-item Positive and Negative Affect Schedule (PANAS) created by Watson, Clark, and Tellegen (1988). The PANAS is a widely established measure of affect, which can be used both in clinical settings, for example, to differentiate between depression and anxiety (Clark & Watson, 1991; Terracciano, McCrae, & Costa, 2003), and in research settings. It has been used in more than 450 published articles from diverse fields within the last 10 years (Seib-Pfeifer, Pugnaghi, Beauducel, & Leue, 2017). At the present moment, there exists no validated Finnish translation of PANAS, limiting the toolkit available to clinicians and researchers in Finland. However, previous studies have revealed inconsistent results regarding the factor structure of the PANAS (e.g., Gaudreau, Sanchez, & Blondin, 2006; Mehrabian, 1997) and regarding the inter-relationship of the factors (e.g., Crawford & Henry, 2004). Furthermore, there seems to be culture-specificity as to the item-level content of the dimensions, as specific items have performed differently in different cultural and lingual environments (e.g. Joiner, Sandín, Chorot, Lostao, & Marquina, 1997; Thompson, 2007). Therefore, instead of merely translating the original PANAS, this measure was developed taking the 60-item extended version of the PANAS, the PANAS-X (Watson & Clark, 1994), as a starting point, examining the factor structure, and including only the items identified as good measures of the identified affective dimensions in a sample of Finnish adults.

1.1 Theoretical Underpinnings

Historical accounts of affect research often identify two opposing approaches to conceptualizing affect, that is, the categorical and dimensional approaches. However, it must be noted that the organizing of emotional concepts by such a taxonomy has been heavily criticized (see Barrett, 2017). In short, within the heterogeneous set of approaches often labeled as categorical, affective states are considered to be constructed from specific and discrete categories. Within these approaches, prototypical emotional states or “basic

emotions", such as anger, joy, fear, and sadness, form categories to which other, similar emotions are related. Each prototypical emotion is thought to represent a particular profile in experience, physiological activation, and behavior (Ekman, 1999). As an example, from this perspective anger and fear are seen as conceptually distinct, since they differ in many important ways, e.g., appraisal, physiology, and probable behavior (Ekman, 1992).

Within approaches usually labeled as dimensional, focus lies on common descriptive features, and affects are examined based on different descriptive dimensions (Barrett, 2016). Most prominent dimensional models of affect have found two general dimensions by which to describe similarities and differences in affect (Watson, 2007). For example, in the 1980's a circumplex model of affect proposed by Russell (1980) became the most widely accepted. In this model, the two most important dimensions represent valence (Pleasure-Displeasure) and arousal (Degree-of-Arousal), respectively. The opposite poles of the valence dimension represent states of pleasure (e.g., joyful) and states of displeasure (e.g., sad), whereas contrasting poles on the arousal dimension represent low arousal (e.g., relaxed) and high arousal (e.g., excited; Russell, 1980). From this perspective, anger and fear are categorized as conceptually similar affective states, because they both share similar negative valence and level of activation.

In the mid-1980's an alternative to Russell's two-dimensional model arose from analyses of self-reported mood (Watson & Tellegen, 1985). Watson and Tellegen (1985) proposed an alternative structure, consisting of two largely independent, orthogonally rotated factors, named Positive Affect (PA) and Negative Affect (NA) that consistently emerged across several types of evidence. These factors were later renamed into Positive Activation and Negative Activation, respectively, to better describe the focus on activation of positively and negatively valenced affects[1] (Watson, Wiese, Vaidya, & Tellegen, 1999). The NA dimension represents "the extent to which one is nonspecifically experiencing a negative or aversive mood, such as feelings of nervousness, sadness, irritation, guilt, contempt, or disgust", and the PA dimension reflects "the extent to which one is experiencing a positive mood, such as feelings of joy, interest, energy, enthusiasm, or alertness" (Watson & Clark, 1997, p. 270). The PA and NA affect dimensions have been found in different languages and cultures (e.g., Almagor & Ben-Porath, 1989; Balatsky & Diener, 1993), as well as using different time frames (e.g., "right now", "during the past week", or "in general"), and response formats (Watson & Clark, 1997).

[1] The terms positive and negative affect, and positive and negative activation, respectively, will be used interchangeably in this dissertation

This model by Watson et al. (1985) was further developed by Tellegen, Watson, and Clark (1999), who proposed a hierarchical model, where several of the aforementioned models and approaches were synthesized into a three-level hierarchical structure. In this model, the highest level reflects a general, bipolar dimension of Happiness-Versus-Unhappiness, comparable to the Pleasure-Displeasure dimension in Russell's circumplex model (1980). The second level consists of the two PA and NA dimensions discussed above, whereas the third and final level in the hierarchical model is comprised of distinct affects, similar to those studied within the categorical approach.

Watson and colleagues have repeatedly reassessed and improved their model over the years. Although the PA and NA dimensions were originally specified to be orthogonal (Watson & Tellegen, 1985), this supposition was later loosened, proposing that although "NA and PA are highly distinctive dimensions that reflect separate underlying systems… these two adaptive systems must be in communication with—and be influenced by—one another" (Watson et al., 1999, p. 835-836). In these later theoretical developments, Watson et al. (1999) also argue that the dimensions are the subjective components of broader biobehavioral systems, that is, specific neuronal systems that regulate withdrawal and approach behavior, such that NA is closely related to the withdrawal-oriented system, and PA to the approach-regulating system.

As such, the PA and NA dimensions can be described as blends of valence and activation dimensions, or as 45° rotations of Pleasure-Displeasure and Degree-of-Arousal dimensions in Russell's (1980) circumplex model (Watson & Tellegen, 1985). However, this is not quite accurate, since the PA and NA dimensions are not built on a circumplex model (Tellegen, Watson & Clark, 1999). The PA and NA dimensions are only weakly bipolar, at least in between-subjects data, and the poles on these dimensions do not represent antonyms, as they would in a circumplex (Watson & Clark, 1997; Watson et al., 1999). Instead, the poles range from absence of positive or negative activation, to high positive or negative activation.

1.2 Development of the PANAS

To measure the latent PA and NA dimensions, Watson, Clark, and Tellegen (1988) developed the PANAS. The 20-item questionnaire consists of two scales, PA and NA, comprised of 10 mood terms each (Watson, 1988; Appendix A). As noted earlier, these scales measure the PA and NA dimensions, which represent blends of valence and activation. More precisely, having been constructed using exploratory factor analysis (EFA), the PA and NA scales reflect shared variance common to positive (PA-dimension) and negative (NA-dimension) mood

descriptors, respectively, and account for roughly one-half to three quarters of the common variance in mood terms (Watson & Clark, 1994). The PA scale contains items like “alert”, “attentive”, and “excited”, and the NA scale consists of terms like “afraid”, “upset”, and “irritable”. Low PA scores are considered to reflect “sadness and lethargy”, and high scores “high energy, full concentration and pleasure” (Watson et al., 1988, p. 1063). Low NA scores, on the other hand, describe “a state of calmness and serenity”, and high scores “subjective distress and unpleasurable engagement” (Watson et al., 1988, p. 1063). However, low scores should be interpreted with caution, since the scales are only weakly unipolar, and they merely reflect the absence of NA or PA (Watson & Clark, 1997). Respondents are asked to indicate, on a Likert-type scale ranging from 1-5 (1 indicating “very slightly or not at all”, and 5 “extremely”), to what extent he or she has been experiencing the given affective state during a certain time frame. Total scale scores are calculated by summing the responses. The PA and NA scales have been validated using eight different time frame instructions, ranging from “right now” and “today” (“Indicate to what extent you have felt this way today”), to “during the past year” and “how you generally feel this way, that is, how you feel on the average” (Watson et al., 1988, p. 1065). Depending on this time frame instruction, the PANAS questionnaire can be used either as a measure of state affect, that is, measuring relatively short-term, temporary variations in PA and NA, or as a measure of trait affect, measuring more stable and enduring individual characteristics (Watson et al, 1988). Later, Watson and Clark (1994) also developed the 60-item PANAS-X (Appendix A), measuring both the higher order PA and NA dimensions, using the items from the original PANAS, as well as the following 11 hierarchically lower-level, more specific affective states: Fear, Sadness, Guilt, Hostility, Shyness, Fatigue, Surprise, Joviality, Self-Assurance, Attentiveness, and Serenity (Watson & Clark, 1994). As such, the PANAS-X measures two of the three layers in the hierarchical model by Tellegen, Watson, and Clark (1999) outlined above.

The PANAS items were selected from an empirically derived list of 60 mood terms used in previous factor analyses by Zevon and Tellegen (1982). This original list of terms had been constructed by subjecting 117 words used in earlier affective studies by Izard (1972), Nowlis (1965), Zuckerman and Lubin (1965), and Ekman (1971) to principal-component analysis (PCA; Watson et al., 1988). This analysis yielded a total of 20 content categories, from which the list of 60 terms was created by taking three terms from each category, with the aim of providing a comprehensive coverage of the affective lexicon (Zevon & Tellegen, 1982). Based on factor analyses conducted by Zevon and Tellegen (1982), Watson et al. (1988) constructed the PANAS by selecting “terms that were relatively pure markers of either

PA or NA; that is, terms that had a substantial loading on one factor but a near-zero loading on the other", to create a brief, yet reliable and valid measure of the PA and NA dimensions (Watson et al., 1988, p. 1064).

The original PANAS has been shown to have good reliability and validity (Watson & Clark, 1994; Watson et al., 1988). Its internal consistency was first examined in six large data sets (n = 586-1002), where coefficient alphas ranged from .86 to .90 for PA, and from .84 to .87 for NA (Watson et al., 1988). Further reliability data for the PA and NA scales was collected during development of the PANAS-X. These extensive analyses consisted of an additional 19 samples (N = 17,549), representing eight different time instructions, where coefficient alphas ranged from .84 to .91 for PA, and from .83 to .90 for NA (Watson et al., 1994). Taken together, these results show that the PA and NA scales have high internal consistency (Streiner, 2003).

Similarly, the validity of the PA and NA scales has been carefully studied. During the initial development of the PANAS, each of the six data sets mentioned above were subjected to EFA to establish factorial validity. Two factors were extracted from each set. The correlations between the PANAS total raw scores and the regression-based estimates for each of the two factors ranged from .89 to .95 for the PA scale and the PA factor, from -.02 to -.17 for the PA scale and the NA factor, from -.09 to -.18 for the NA scale and the PA factor, and from .91 to .93 for the NA scale and the NA factor (Watson et al., 1988). Correlations of the same magnitude were found during development of the PANAS-X, where an additional 13 data sets, consisting of both within- and between-subjects analyses, were analyzed (Watson & Clark, 1994). These results suggest that the PA and NA scales are accurate measures of the underlying PA and NA dimensions, and that the affective structure is highly stable across varying temporal instructions (Watson & Clark, 1997). Construct validity was also established through several other lines of evidence, for example, through the convergence between self-ratings and ratings made by well-acquainted peers (Watson & Clark, 1991; Watson et al., 2000), significant stability of trait PA and NA over several years (Watson & Clark, 1994), and strong convergence with personality traits of extraversion and neuroticism (Watson et al., 1999).

1.3 Structural inconsistencies in the PANAS

There has been much discussion concerning the two-factor structure of the PANAS. The PANAS was originally built on an assumption of two separate, orthogonal PA and NA factors (Watson et al., 1985; Watson et al., 1988), and as noted above, the assumption of

orthogonality was later loosened, allowing for low, negative correlations (Watson & Clark, 1997). Several other authors have, however, been critical to the separating of PA and NA into independent dimensions, and have instead argued that PA and NA are highly correlated and constitute opposite poles on a single bipolar dimension (e.g., Green, Goldman, & Salovey, 1993; Russell & Carroll, 1999). In practice, independence between PA and NA would mean that an individual can, for example, simultaneously experience both high positive and negative affective states, and thus score high on both PA and NA, whereas bipolar conceptualizations would predict the absence of PA during high NA (Watson & Clark, 1997; Watson et al., 1988). Hence, the presence of a bipolar structure would predict a strong negative correlation between PA and NA factors. However, in their review of the extant literature, Tuccito et al. (2010) stated that previous studies, including their own, have repeatedly failed to find such correlations (e.g., Crawford & Henry, 2004; Gaudreau et al., 2006; MacKinnon et al., 1999), and that the PA and NA factors have consistently been found to share no more than 9.00% of their variance. This is in line with the extensive data presented by Watson and colleagues, where the size of the negative correlation between PA and NA varies from low to moderate, indicating "quasi-independence" (Watson et al., 1988; Watson & Clark, 1997). The relationship has also been shown to be stable irrespective of time frame, that is, both using state and trait measures of PANAS (Watson & Clark, 1997).

In relation to the discussion regarding the relationship between the PANAS PA and NA dimensions, the make-up of the two-dimensional model itself has also been the object of an on-going debate since the beginning of PANAS research. It has been questioned whether the PANAS indeed does measure two independent factors, that is, whether the originally proposed orthogonal, or the later proposed quasi-independent, two-factor model fit the PANAS data, or if alternative factor structures would better explain the variation in PANAS scores. Several more recent studies employing confirmatory factor analysis (CFA) have compared bipolar one-factor models to two-factor models, both those that specify the PA and NA factors to be uncorrelated, and those that allow the factors to correlate. These studies have shown that although two-factor models show superior fit to bipolar one-factor models, they still fail to attain acceptable fit (Crawford & Henry, 2004; Gaudreau et al., 2006; Leue & Beauducel, 2011; Mehrabian, 1997; Seib-Pfeifer et al., 2017; Tuccitto, Giacobbi, & Leite, 2010).

However, some modified two-factor models have produced better results. As noted previously, the PANAS is built from a list of 60 items, consisting of 20 mood content categories (Watson & Clark, 1988). Since items from the same categories possibly represent

overlap, and share unique variance, one proposed type of two-factor model consists of allowing the error of items from the same mood content category to correlate (Crocker, 1997). Several studies employing CFA have found such models to have acceptable to good model fit (e.g., Crawford & Henry, 2004; Engelen, De Peuter, Victoir, Van Diest, & Van den Bergh, 2006; Merz & Roesch, 2011; Rush & Hofer, 2014; Serafini, Malin-Mayor, Nich, Hunkele, & Carroll, 2016; Tuccitto et al., 2010). Some of these models have found support for oblique PA and NA factors (e.g., Crawford & Henry, 2004), others for orthogonal conceptualizations (Tuccitto et al. 2010).

There is also evidence suggesting more complex factor structures. In the three-factor structure originally proposed by Merhabian (1997), the NA factor is further split into two factors, namely Afraid (anxious) and Upset (mix of anger and dejection). Although Mehrabian (1997) found the three-factor model to yield poor fit, as did Crawford and Henry (2004), others have found support for similar three-factor structures using either EFA (Beck et al., 2003; Killgore, 2000) or CFA (Gaudreau et al., 2006).

Recently, bifactor models have been suggested as a means to resolve the structural ambiguity found in PANAS (Seib, 2017). In bifactor models, the items are allowed to load on more general factors and on more specific factors in varying degrees. Ebesutani et al. (2012) found support for separating the NA factor into two specific NA factors, NA-Distress and NA-Fear, using a bifactor model, in addition to two general uncorrelated factors, PA and NA. A bifactor model was also suggested by Leue and Beauducel (2011), who found support for a model with uncorrelated specific PA and NA factors, and an additional general factor, which was named Affective Polarity, representing a fundamental tendency towards approach or avoidance behavior (Leue & Beauducel, 2011). It should also be noted that this bifactor model showed better fit compared to both the correlated and uncorrelated two-factor models, and also compared to a three-factor model similar to the one proposed by Merhabian (1997).These findings were replicated by Seib-Pfeifer et al. (2017), who recently compared the following factor models by means of CFA: (1) an uncorrelated two-factor model, (2) a correlated two-factor model, (3) a three-factor model, as found in Gaudreau et al. (2006), with NA further split into NA-Upset and NA-Afraid (both uncorrelated to PA), and (4) a bifactor model, as proposed by Leue and Beauducel (2011). Seib-Pfeifer et al. (2017) only found weak evidence for the two-factor models, and both the three-factor and bifactor models comprised superior model fit. Of these, only the bifactor model reached acceptable fit. However, it must be noted that neither Leue and Beaducel (2011) nor Seib-Pfeifer et al. (2017) included two-factor models allowing for correlated mood content categories in their comparisons.

In sum, although the original PANAS has been found to have good reliability and validity, after decades of research, there are still significant inconsistencies among studies examining the factor structure of the PANAS. While there is some evidence supporting a two-factor structure in the form of models allowing for correlated errors among items from the same mood content categories, several other, more complex structures have also been proposed. In some of these models PA and NA have been modeled as orthogonal, and thus uncorrelated, while others have found support for oblique models, allowing PA and NA to correlate. Still, most studies support the conceptualization of PA and NA as moderately negatively correlated, yet distinct, dimensions (Crawford & Hendry, 2004; Watson et al, 1988; Villodas et al., 2011). Since the PANAS is to measure these affective dimensions, the test structure, or the composition of the various scales, should reflect the theoretical affect structure. Therefore, in light of these inconsistencies, studying this issue in parallel to test development is of importance not only from a theoretical perspective, but also from a psychometric one.

1.4 Cross-cultural Considerations

The aim of this dissertation was to develop a Finnish measure of PA and NA. The original 20-item PANAS has previously been translated into multiple languages, e.g., Estonian (Allik & Realo, 1997), Swedish (Hillerås et al., 1998), Italian (Terraciano, McCrae, & Costa, 2003), Serbian (Michic, et al., 2014), Spanish (Joiner et al., 1997), and French (Gaudreau et al., 2006), but a validated Finnish translation is to our knowledge still lacking. These versions of PANAS have mostly been translated using back-translation, and validated by examining the factor structure, as well as the pattern of convergent and discriminant validity to related constructs (e.g., Gaudreau et al., 2006; Terracciano et al., 2003). Interestingly, although the bidimensional structure of the PANAS has generally been shown to be stable across cultures (Allik & Realo, 1997; Almagor & Ben-Porath, 1989; Melvin & Molloy, 2000; Rodriguez & Church, 2003; Watson, Clark, & Tellegen, 1984;), there has been significant variation in how well specific items have fared in different cultures, reflecting culture-specificity of the content of the dimensions. For example, during the development of a Spanish version of PANAS, Joiner et al. (1997) found that the items “hostile” and “proud” did not perform well as measures of the intended dimensions, and attributed this to both semantic and cultural influences. Watson et al. (1984) found that the item “sleepy/tired” was a poor indicator of NA among Japanese participants, and ascribed this to cultural differences in attitudes towards sleep. Furthermore, variation in item loadings have even been reported in studies using the

original English PANAS in non-north American cultures. For example, Mackinnon et al. (1999) found the item "excited" to load on both PA and NA in an Australian sample, and argued the word to have a double meaning, at least in Australia. Using an international sample of individuals from 38 different countries, but proficient in reading, writing, and speaking English, Thompson (2007) found that several PANAS items did not constitute good measures of either PA or NA.

This is in line with more theoretical cross-cultural examinations of affective conceptualizations, and studies examining translational equivalence. These suggest that general dimensions are cross-culturally more similar, while more specific levels show significant variation. For example, the dimensions of valence, potency, and arousal are found in analyses of emotional words in over 30 languages, but languages can also differ greatly in how emotions are conceptualized, in the amount of words designated to describe different affective experiences, and hence in the nuances each word describes (Ogarkova, 2016, p. 578). According to Ogarkova (2016), "implicit evaluations of whether emotion words (and the concepts behind them) are negative or positive, whether an emoter feels powerful/weak, aroused, or calm are a universal part of the connotation of emotion words" (p. 578), but that "(e)ven in cases of a core overlap of meaning, several aspects, including the social parameters, still differentiate between deemed translation correlates" (p. 592).

In relation to translations of PANAS, this could mean that although translated versions have been largely successful in replicating the general affective structure, the specific translated affective terms might not be optimal measures of PA and NA in that specific lingual environment. In theory, this could possibly even affect results from analyses of factor structure. As an example, both studies that found support for a bifactor model (Leue & Beaducel, 2011; Seib-Pfeifer et al., 2017) made use of the German version of the 20-item PANAS (Krohne et al., 1996).

1.5 Aims of the Present Study

The aim of this study was to develop a brief-format Finnish measure of PA and NA, similar to the PANAS, and to study its psychometric properties. Considering previous studies showing inconsistencies in the PANAS factor structure, and the more theoretical cross-cultural considerations outlined above, the goal was to develop a culturally valid measure of PA and NA. The first step in this study was to explore the general structure of self-reported affect in a sample of monolingual Finnish-speaking adults. This was done by subjecting the 60 double back-translated PANAS-X items to EFA. The EFA:s were conducted separately for the two

time frame instructions, so as to explore possible variations in the factor structures in measures of state and trait affect, respectively. The goal was to gain some clarity about the PA and NA factor structure, especially the inter-relationship between the two constructs, in a Finnish-speaking environment, and to use the EFA analysis as a basis for development of the Finnish measure. The PANAS-X was chosen as a starting point, since it consists of items representing a broad range of affective states, while it also contains all of the 20 items from the original PANAS (Watson & Clark, 1994).

The items to be included in the measure were selected based on the two EFA:s. In relation to the likely variability in meaning and function that each affective word may have in a specific culture, the items with the highest average loadings across the two EFA were selected, that is, those translated PANAS-X items that consistently had high loadings, in both time frame instructions, and thus were good and reliable measures of PA and NA. Compared to only translating the 20 original PANAS items, as has been previously done, this procedure helped identify the items that were the strongest measures of the underlying factors in this sample.

After item selection, the construct validity and internal consistency of the measure was examined. The expected pattern of correlations between PA and NA and the validity measures was established according to results from previous studies: Depression has been indicated to have a weak to moderate negative association with PA, and weak to moderate positive association with NA (Crawford & Henry, 2004; Villodas, Villodas, & Roesch, 2011; Watson et al., 1988). Similarly, stress has been found to be unassociated or weakly negatively associated with PA, and moderately positively associated with NA (Crawford & Henry, 2004; Villodas et al., 2011; Watson, 1988). Self-reported health has also been shown to be negatively associated with NA, but that the association with PA is more complex and varies depending on the sample and situation (Finch, Baranik, Liu, & West, 2012; Watson & Pennebaker, 1989). In contrast, self-esteem has been shown to be weakly positively associated with PA and weakly to moderately negatively associated with NA (Ayyash-Abdo & Alamuddin, 2007; Merz & Roesch, 2011; Watson & Clark, 1984). The questions measuring quality of life (QoL) and satisfaction with life (SWL) were also hypothesized to be positively correlated with PA and negatively correlated with NA, based on theory (Dijkers, 2005) and previous findings (Jovanović, 2015b, 2015a; Martin, Rodham, Camfield, & Ruta, 2010). Finally, the question measuring current mood was assumed to be positively correlated with PA and negatively correlated with NA in this sample of psychiatrically healthy individuals. In addition, in order to establish the validity of the distinction between state and

trait measures of PA and NA, the factor scores of state PA and NA were expected to correlate more highly with more momentary, short-term measures than with more stable, long-term measures, and the reverse was expected for the trait PA and NA factors.

Finally, to improve the ability to interpret scores, the measure was accommodated with a set of norms. The score distributions of the newly developed measure were examined, both across the whole sample and separately by demographic factors, and separate norms were produced where applicable.

2 Method

2.1 Participants

The data for this study were collected as part of a larger study on the evaluation of and memory for emotion-laden words in normal aging (PhD, M SocSc Carina Saarela, Abo Akademi University) and a compulsory Bachelor level course in psychology, Practice in Psychological Research (psychology students Nina Svedström-Koskinen and Malin Rönnholm).

The online questionnaire was answered by altogether 863 volunteers, recruited by e-mail using various university mailing lists. The following inclusion criteria had to be met: Participants had to be 1) at least 18 years old, 2) monolingually Finnish-speaking, and 3) psychiatrically healthy, defined as not having been diagnosed with a psychiatric illness during the last 12 months, nor currently using any psychiatric medication. Seventeen participants were excluded due to failure to fulfil the inclusion criteria based on their responses to the background questions in the questionnaire. Furthermore, 12 participants were excluded from the data analyses due to missing demographic information. Another 17 participants were excluded after having been identified as random responders by visual inspection and frequency tables. A random responder was defined as someone responding on both sets of translated PANAS-X items primarily with either only one or two of the scores on the 5-point Likert scale. This resulted in a total of 46 excluded participants and 817 included participants. The excluded participants were on average slightly older, $M = 30.37$, $SD = 12.95$, compared to the included participants, $M = 26.23$, $SD = 7.74$, $t(46.83) = 2.15$, $p = .037$, $d = .39$. There were no significant differences in gender distribution, $\chi^2(1, N = 863) = 2.27$, $p = .096$, or attained educational level, $p = .56$, Fisher's exact test, between the excluded and included participants.

The demographic characteristics, including occupational status, of the whole sample and separately for the gender groups are presented in Table 1. The final sample of 817 participants included in the statistical analyses ranged in age from 19 to 71 years, and predominantly consisted of women and participants with upper secondary education or a Bachelor´s degree. Men were on average somewhat older than the women, $t(223.368) = 3.04$, $p = .003$, $d = .28$ (see Table 1). There were no significant differences in attained educational level between the gender groups, $p = .096$, Fisher's exact test.

Participation in the study was voluntary and no monetary reimbursement was given for participation. However, participants to any of the research projects in the Bachelor level course could choose to take part in an optional lottery, where two prizes were awarded; a gift card to a department store or a set of ten movie theatre tickets, both worth approximately 85 euros. All contact information for the lottery was collected separately from the word evaluations in order to ensure anonymity.

2.2 Materials

2.2.1 PANAS-X items. Written consent to use the PANAS-X as a base to develop a measure of PA and NA in Finnish was obtained from Professor David B. Watson (personal communication, February 16, 2011). The 60 PANAS-X items (see Appendix A) were translated to Finnish by means of a double back-translation procedure. The items were first translated from English to Finnish by two independent professional translators. These translations were translated back into English by two additional professional translators. Translations were compared to the original questionnaire, and conflicting translations were discussed and settled by the researchers most proficient in Finnish (Saarela and Svedström-Koskinen). The final translated items can be seen in Appendix A.

In accordance with the original PANAS-X instruction (Watson & Clark, 1994), each of the PANAS-X items were to be rated on a Likert-type scale ranging from 1 = "very slightly or not at all" ["erittäin vähän tai en ollenkaan"] to 5 = "very much" ["erittäin paljon"], measuring the extent to which participants had experienced each affect within the specified time-frame. Both state and trait data were collected, using the "right now" and "in general"

Table 1

Comparison of Demographic Characteristics Between Male and Female Participants

Variable	Male (n = 172)	Female (n = 645)	Total (N = 817)
Age (years): *M* (*SD*)	28.1* (*9.59*)	25.7* (*7.10*)	26.2 (*7.74*)
Education[a]			
Lower secondary (%)	0.5	0.6	0.5
Upper secondary (%)	43.7	47.1	44.4
Bachelor's or equivalent (%)	37.4	29.1	35.6
Master's or equivalent (%)	14.6	19.8	15.7
Doctoral or equivalent (%)	3.9	3.5	3.8
Occupation			
Non-worker[b] (%)	0.3*	2.3*	0.7
Student (%)	69.5	63.4	68.2
Manual labour (%)	0.3*	1.7*	0.6
Services (%)	5.9	3.5	5.4
Expert (%)	14.4	17.4	15.1
Specialist (%)	9.0	11.0	9.4
Manager (%)	0.6	0.6	0.6

Note. [a]Attained level of education; Classification of education groups based on ISCED (2011); Lower secondary = finished primary and lower secondary, upper-secondary or post-secondary non tertiary in progress; Upper secondary = , upper-secondary or post-secondary non tertiary finished. [b] Non-worker = not currently working.

*p < .05, two sided.

instructions, respectively. The instructions were translated from PANAS-X (Watson & Clark, 1994), and a back-translation of the state instruction into English was the following:

"Below you will see words that describe different emotions and emotional experiences. Read each word and mark the appropriate answer into the circles next to the word. Report to what degree you feel this way RIGHT NOW."

2.2.2 Raitasalo-Beck-Depression-Inventory and Rosenberg Self-Esteem Scale. To assess the construct validity of the Finnish measure of Positive and Negative Affect (FiPANA), the Raitasalo-Beck-Depression-Inventory (RBDI; Raitasalo, 2007), and a translated version of the Rosenberg Self-Esteem Scale (RSES; Raitasalo, 2007) were used with the written consent of Raimo Raitasalo, Ph.D. (personal communication, March 6, 2011). The RBDI mood questionnaire (Raitasalo, 2007), which is a modification of the Beck Depression Inventory (BDI; Beck & Beck, 1972), consists of three subscales, of which two, the depression and self-esteem subscales, were central in the evaluation of validity in this study.

The RBDI is made up of 14 multiple-choice questions. Each question is presented along with five statements, and respondents are instructed to select the statement that best describes how one currently perceives oneself. The RBDI was scored according to Raitasalo (2007). The RBDI has been used in Finland for nearly 30 years, and internal consistency reliability (Cronbach's alpha) for the RBDI in Finnish studies has varied between 0.66-0.93 for the depression subscale, and between 0.76-0.84 for the self-esteem subscale (Raitasalo, 2007). There is no reliability data for the anxiety subscale.

The RSES is one of the most widely used measures of global self-esteem (Hyland, Boduszek, Dhingra, Shevlin, & Egan, 2014). The questionnaire consists of 10 statements and is based on Rosenberg's theory of a unidimensional structure of self-esteem (Rosenberg, 1965). The questionnaire has been translated into Finnish by Raitasalo and Lipiäinen (Raitasalo, 2007). Respondents are instructed to rate to what degree they agree to the presented statements. The RSES was scored according to Raitasalo (2007). Internal consistency reliability data (Cronbach's alpha) for RSES has varied between 0.77-0.88 in previous studies using the original RSES (Blascovich & Tomaka, 1993; Boduszek, Hyland, Dhingra, & Mallett, 2013). No reliability data for the Finnish version of RSES has been published. In the current study internal consistency for the RSES was .91.

2.2.3 Additional validity measures. While the RBDI and RSES were the most central measures for establishing validity of the Finnish measure of PA and NA, an additional eight constructed, and thus unstandardized, questions were also administered. The eight questions assessed the following attributes: current experience of stress and experiences of stress during the past 12 months, current QoL and QoL during the past 12 months, current SWL and SWL during the past 12 months, as well as current state of health, and current mood. Answers to these questions were given on a Likert-type scale ranging from 1 to 5, that

is, from low to high levels of the attribute in question. The respondents were also asked to indicate whether they had previously (more than 12 months ago) been diagnosed with a psychiatric diagnosis. An additional four open-ended questions on exercise habits, social activity habits, hobby habits, and major life changes were administered, but excluded from analysis due to having been poorly formulated and thus exhibiting poor psychometric properties.

2.3 Procedure

The study was approved by the Institutional Review Board of the Department of Psychology and Logopedics (now the Department of Psychology) at Abo Akademi University. All participants gave written informed consent prior to entering the study. They entered the study with the understanding that participation was anonymous and that the answers would be treated confidentially. Informed consent was therefore also given anonymously by all participants. This procedure was approved by the Institutional Review Board. All procedures were in accordance with the revised Helsinki Declaration (2013). First, a small-scale pilot study was conducted to estimate the duration of the survey, which was approximated to last 30 minutes. Participants were recruited in March 2011. The use of mailing lists for distributing the study recruitment e-mails was approved by webmasters in charge of the lists. Data was collected online using the E-lomake survey service (version 3.1; www.e-lomake.fi) in March 2011. The questionnaire can be seen in Appendix B. All participants completed the questionnaire in the same order. Participants first answered questions regarding demographic information and inclusion criteria, as well as questions measuring health, mood, QoL, SWL, stress, and medical history. Next, participants rated the 60 translated PANAS-X items with the time instruction “right now”, followed by the RBDI and the RSES. Finally, the translated PANAS-X items were rated once more, this time with the time instruction “in general”. After completing the questionnaire, participants could choose to partake in the lottery. The personal information entered in connection to the lottery was collected separately and could not be traced back to answers given during the study. The participants could terminate the questionnaire at any time.

2.4 Statistical Analyses

2.4.1 Exploratory factor analyses. All statistical analyses were performed using IBM SPSS statistics, version 24. Two separate EFA:s were conducted on the state ("right now") and trait ("in general") data to study whether emerging factor structures, and most importantly, interrelations between the factors were similar, and whether the same items loaded on the same factors with similar magnitude.

With 817 participants and 60 items, our subject-to-item ratio was decidedly higher than the minimum of 5:1 as recommended for EFA by Gorsuch (1983). The normality of the translated PANAS-X variables was evaluated by examination of skewness and kurtosis, and by visual analysis of P-P plots. Roughly half of the items in the state condition and one third in the trait condition were clearly non-normally distributed. Items belonging to the PANAS-X PA and Basic Positive Affective Scale, that is, measures of PA in the PANAS-X, mostly exhibited negative skew, while measures of NA, that is, items from the PANAS-X NA and Basic Negative Affect Scales, exhibited positive skew. The latter group of items also exhibited much higher levels of skew. Despite non-normality, transformation was not applied, since it would have made interpretation of results and comparison with previous studies problematic.

Univariate outliers were identified by examining z-scores, and the analysis revealed that most outliers, $z > \left|3{,}29\right|$, stemmed from the heavily skewed variables. However, since high variability in both state and trait affectivity was to be expected, and responses were limited to a Likert-type scale ranging from 1 to 5, some extreme values were expected and therefore no univariate outliers were removed. Multivariate outliers were identified by calculating a leverage statistic and using criteria set by Lunneborg (1944), resulting in a total of 47 multivariate outliers across both time frame instructions. Using discriminant analysis to inspect whether these multivariate outliers could be traced to specific variables (Tabachnick & Fidell, 2013), 12 variables were identified and examined. However, since inclusion of all PANAS-X items was important, and examinations indicated only small differences between the 12 identified variables and the rest, the identified variables were retained. Thus, instead of either simply removing the 47 cases identified as multivariate outliers, or the variables associated with these, separate EFA: s including and excluding multivariate outliers were conducted, and the results compared, as recommended by Tabachnick and Fidell (2013).

The translated PANAS-X items, measured on a 5-point Likert-type scale, were treated as continuous as in previous PANAS studies (e.g., Crawford & Henry, 2004; Watson & Clark, 1997; Watson et al., 1988). Linearity of translated PANAS-X items was checked by

examining bivariate scatterplots of variables with opposite skew (Tabachnick & Fidell, 2013), and was found to be satisfactory in both state and trait data.

Risk of multicollinearity was assessed by examining pairwise correlations of >.80, squared multiple correlations of item correlations (Tabachnick & Fidell, 2013), and the condition index and variance proportions as suggested by Belsely et al. (1980). Correlations of <.30 and initial communality values in PCA were also examined to identify variables possibly unrelated to the rest (Tabachnick & Fidell, 2013). In the state condition, multicollinearity was identified between items "*uninen"* (sleepy) and "*unelias"* (drowsy). In addition, the items "*innokas"* (excited) and *'innostunut'* (enthusiastic) exhibited high bivariate correlation (r = .82). Based on congruence among translators during the back-translation process, items "*uninen*" (sleepy) and "*innokas*" (excited) were chosen for removal, resulting in a total of 58 variables entered into the EFA in the state condition.

In the trait condition, multicollinearity was identified between items "*innostunut*" (enthusiastic) and "*innokas*" (excited). Item pairs "*unelias*" (drowsy) and "*uninen*" (sleepy; r = .87), as well as "*yksinäinen*" (lonely) and "*yksin*" (alone; r = .83), exhibited high bivariate correlations. Again, based on translational congruence, items "*innokas*" (excited), "*uninen*" (sleepy), and "*yksin*" (alone) were removed. A total of 57 variables were thus entered into the EFA in the trait condition.

Factorability of data was assessed using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, as well as by examining the r-matrix for correlations above |.30|, the significance of these correlations, the partial correlation matrix, and the off-diagonal values in the anti-image matrix (Tabachnick & Fidell, 2013). Both state data (*KMO* = .949) and trait data (*KMO* = .952) fulfilled all criteria and were found suitable for factor analysis.

The initial number of factors to extract was estimated using PCA and the Kaiser criterion; by conducting a parallel analysis using SPSS syntax by O'Connor (2000); and was further guided by conducting a scree test (Cattell, 1966; Tabachnick & Fidell, 2013). However, since EFA is an iterative process, several plausible solutions were extracted and inspected, before deciding on the preferred solution (Osborne, 2014). Due to the non-normality of several translated PANAS-X items, these solutions were extracted using principal axis factoring (PAF; Osborne, 2014).

Also, since the aim was to develop a 20-item measure of general self-reported affect, the maximum number of factors to extract was set to 4. Although theory and cross-cultural findings clearly indicate two general affective dimensions in self-rated mood (Watson et al., 1999), we also examined the three- and four-factor solutions for explorative reasons, and due

to findings in previous studies of the PANAS indicating more than two factors (e.g., Gaudreau et al., 2006; Mehrabian, 1997). Although results from these studies most likely reflect the specific content of the PANAS, rather than the general structure of self-reported mood, it was nevertheless interesting to examine whether factor structures identified in this sample would resemble those found in previous PANAS research.

The two-, three- and four-factor solutions were extracted using PAF and rotated using varimax rotation (Tabachnick & Fidell, 2013). The preferred solution was then selected by examining the amount of accounted variance, and by comparing the content of the factors to previous findings, as well as taking into account results from the data-driven indicators of the number of factors to extract presented above. The preferred solution was then examined using oblique rotation, since it permits factors to be correlated, yet does not hinder uncorrelated factors to emerge (Browne, 2001). This step was interesting in light of previous debates within the field regarding the orthogonality of the PA and NA factors (Crawford & Henry, 2004; Tuccitto et al., 2010). Finally, adequacy of rotation of the preferred solution was assessed by examining whether highly correlated items loaded on the same factor, and by plotting factor scores, and examining their distance, clustering, and direction (Tabachnick & Fidell, 2013).

Next, poorly performing items, defined as having low extracted communalities (<.20; Tabachnick & Fidell, 2013), were removed. In accordance with procedures used during development of the original PANAS, we examined the pattern matrix and also removed items with factor loadings less than |.40|, as well as items that exhibited secondary loadings above |.25| (Watson et al., 1988).

The factorial validity of the final solution, that is, the solution retained after removal of poorly performing and cross-loading items, was assessed by internal replicability analysis. This was done by randomly splitting the sample in half, retesting the factor solution separately on both halves, and examining whether items load on the same factor with roughly the same magnitude (Osborne & Fitzpatrick, 2012). In a similar manner, state and trait EFA solutions were compared to examine whether the same items loaded on the same factor, with similar magnitude, in both conditions. In addition, the EFA solutions including and excluding cases identified as the multivariate outliers were also compared, to examine the effect of the multivariate outliers on the results.

The construct validity of the factors from the final solution was established by extracting regression-based factor scores and examining the correlation of these with the

RBDI, RSES, and the eight additional validity measures, measuring stress, QoL, SWL, current mood, and current health.

2.4.2 Development of the Finnish measure of positive and negative affect. The last step consisted of constructing the FiPANA. Items were selected based on the highest average loading across both state and trait instructions. The 10 highest loading items for each extracted factor were included in the measure. Construct validity of the subscales was assessed by examining correlations with RBDI and RSES, as well as the eight additional validity measures. The expected pattern of correlations was identical to the one outlined in the examination of the construct validity of the factors. Internal reliability coefficients (Cronbach's alpha) were calculated separately for the PA and NA scales, and for state and trait versions of the measure. Differences in PA and NA scale scores were also examined across gender, age, and level of education. Based on the results from these analyses, both general and gender-specific norms were calculated.

3 Results

3.1 Exploratory Factor Analyses

3.1.1 State data. Initial analysis using PCA and varimax rotation revealed a total of 10 factors with eigenvalues greater than one. Parallel analysis, using PCA and a permutation test with 1000 iterations, indicated that the first seven factors had eigenvalues that exceeded the mean eigenvalues and the 95% CI of the randomly generated data sets. Finally, the scree test indicated extraction of two factors. However, as noted above, the maximum number of factors to extract was set to four. Thus, using PAF and varimax rotation, solutions specifying two, three, and four factors were extracted for closer inspection.

The two-factor solution accounted for 40.3% of the variance in the state data. After rotation, each factor accounted for 23.8% and 16.5% of the variance, respectively. The first factor was identified as NA, containing all original 10 NA scale items, as well as all 23 items belonging to the Basic Negative Emotion Scales of the PANAS-X. The second factor was identified as PA, and contained all nine included PA scale items, as well as all 17 Basic Positive Emotion Scale-items included in the EFA (the missing item “innokas”- “excited” was earlier removed due to multicollinearity). Examining the rotated factor matrix, the solution suggested approximate simple structure, with only nine items exhibiting cross-loadings above |.25|, but below |.40|.

The three-factor solution accounted for 43.6% of the variance, with each rotated factor accounting for 23.7%, 13.1%, and 6.8% respectively. The first factor was identified as NA, containing all 10 NA scale items, as well as all items belonging to the Basic Negative Emotion Scales. The second factor was identified as PA, containing 8 PA scale items, and 13 items belonging to the Basic Positive Emotion Scales. The third factor was identified as joviality, containing all of the 7 included items belonging to the PANAS-X Joviality-scale. However, the six items that had their highest loading on the third factor also had almost equally high cross-loadings on the PA factor.

The four-factor solution accounted for 46.5% of the variance, with each rotated factor accounting for 22.7%, 14.5%, 5.6%, and 3.7%, respectively. The first factor was, again, identified as NA, containing all 10 NA scale items, as well as all items belonging to the Basic Negative Emotion Scales. The second factor was identified as PA, containing 7 PA scale items, and 13 items belonging to the Basic Positive Emotion Scales. The third factor was identified as a bipolar attentiveness versus fatigue factor. However, all items loading on the third factor also had high cross-loadings on either the first or the second factor. The fourth

factor was a bipolar shyness versus self-assurance factor. The main loadings of this factor were, however, only slightly higher than the cross-loadings on the first or second factor.

In each of the examined solutions, the two first factors, identified as NA and PA, were the strongest. The additional variance accounted for by the third and fourth factors were comparably small, and most items exhibited high cross-loadings on the first or second factor. Also, the additional factors seemed to specify more specific factors from the PANAS-X scale, such as Joviality in the three-factor solution, and Shyness and Self-Assurance in the four-factor solution. Thus, the two-factor solution was retained and further investigated.

Next, an oblique rotation of the two-factor solution was requested. Although the initially obtained factor correlation of -.174 was markedly lower than the |.32| cutoff recommended by Tabachnick and Fidell (2013) for retaining an oblique versus an orthogonal rotation (p. 651), this solution was nevertheless chosen to be retained in light of previous debates within the field (e.g., Tuccitto, Giacobbi, & Leite, 2010). The pattern and structure matrices for this preferred EFA solution of state data are presented in Table 2.

Rotation was deemed adequate, since highly correlated items loaded on the same factor. However, examination of the factor plot indicated suboptimal distance and clustering. This was due to some items having low factor loadings or cross-loadings, and was expected, since the PANAS-X contains several complex items, designed to measure specific affective states, and which are not pure measures of either PA or NA (Watson & Clark, 1994).

A total of 58 items were initially subjected to this EFA. Of these, five items had extracted communalities below .20 and were removed. Next, examining the pattern matrix, we removed items with loadings below |.40|, and items with secondary loadings above |.25|, resulting in removal of another 11 items. The pattern and structure matrices of the final solution, after item removal, can be seen in Table 3. After removal of poorly performing items, the correlation between the two factors was -.214, and they now jointly accounted for 45.2% of the variance in state data. Also, the factor plot now indicated good distance and clustering.

Internal replicability analyses revealed that the final solution, specifying two factors, and using PAF with oblique rotation, exhibited strong replication (Osborne, 2014). All items were structurally assigned to the same factors as in the final solution. The average absolute difference in factor loadings between the two halves of the sample was .032, with a maximum

Table 2

Pattern and Structure Matrices of the Preferred EFA Solution in the State Condition

Translated item	PANAS-X equivalent	PANAS-X scale	Factor 1: NA	Factor 2: PA
Ahdistunut	Distressed	NA	.776 (.801)	(-.281)
Peloissaan	Scared	Fear, NA	.749 (.739)	
Lannistunut	Blue	Sadness	.740 (.769)	(-.295)
Pelokas	Afraid	Fear, NA	.723 (.716)	
Hermostunut	Nervous	Fear, NA	.708 (.701)	
Inhon tunne	Loathing	Hostility	.706 (.717)	
Häpeissään	Ashamed	Guilt, NA	.703 (.695)	
Vihainen itselleen	Angry at self	Guilt	.703 (.727)	(-.258)
Tyytymätön itseensä	Dissatisfied with self	Guilt	.696 (.724)	(-.287)
Epävarma	Shaky	Fear	.693 (.710)	
Poissa tolaltaan	Upset	NA	.677 (.666)	
Itseinhon tunne	Disgusted with self	Guilt	.673 (.693)	
Pelästynyt	Frightened	Fear	.673 (.648)	
Jännittynyt	Jittery	Fear, NA	.672 (.651)	
Alakuloinen	Downhearted	Sadness	.670 (.720)	-.290 (-.406)
Moitittava	Blameworthy	Guilt	.661 (.666)	

Table 2 (continued)

Surullinen	Sad	Sadness	.652 (.673)	
Vihainen	Angry	Hostility	.648 (.643)	
Hämillään	Sheepish	Shyness	.630 (.597)	
Ärsyyntynyt	Irritable	Hostility, NA	.618 (.630)	
Arka	Timid	Shyness	.615 (.608)	
Vihamielinen	Hostile	Hostility, NA	.607 (.599)	
Syyllinen	Guilty	Guilt, NA	.591 (.592)	
Vastenmielisyyden tunne	Disgusted	Hostility	.571 (.594)	
Ujo	Shy	Shyness	.534 (.517)	
Yksinäinen	Lonely	Sadness	.509 (.535)	
Hämmästynyt	Amazed	Surprise	.495 (.420)	.431 (.345)
Ällistynyt	Astonished	Surprise	.489 (.419)	.405 (.320)
Kaino	Bashful	Shyness	.412 (.383)	
Hidas	Sluggish	Fatigue	.401 (.435)	(-.264)
Rentoutunut	Relaxed	Serenity	-.399 (-.442)	.250 (.320)
Levollinen	At ease	Serenity	-.396 (-.455)	.341 (.410)
Väsynyt	Tired	Fatigue	.395 (.429)	(-.266)
Yksin	Alone	Sadness	.390 (.411)	

Table 2 (continued)

Unelias	Drowsy	Fatigue	.372 (.400)	
Rauhallinen	Calm	Serenity	-.367 (-.388)	
Peloton	Fearless	Self-Assurance	-.313 (-.366)	.304 (.359)
Ylimielinen	Scornful	Hostility	.275	
Innostunut	Enthusiastic	Joviality, PA		.845 (.842)
Eläväinen	Lively	Joviality		.768 (.768)
Energinen	Energetic	Joviality	(-.281)	.749 (.775)
Iloinen	Joyful	Joviality	(-.310)	.738 (.769)
Rohkea	Bold	Self-Assurance		.705 (.707)
Ilahtunut	Delighted	Joviality		.690 (.696)
Kiinnostunut	Interested	PA		.675 (.689)
Päättäväinen	Determined	Attentiveness, PA		.660 (.671)
Toimelias	Active	PA		.659 (.667)
Valpas	Alert	Attentiveness, PA		.611 (.613)
Vahva	Strong	Self-Assurance, PA	(-.267)	.603 (.631)
Hilpeä	Cheerful	Joviality		.603 (.611)
Haltioitunut	Inspired	PA		.591 (.566)
Itsevarma	Confident	Self-Assurance	-.278 (-.381)	.589 (.638)

Table 2 (continued)

Uskalias	Daring	Self-Assurance		.563 (.553)
Ylpeä	Proud	Self-Assurance, PA		.516 (.507)
Onnellinen	Happy	Joviality	-.327 (-.416)	.514 (.570)
Yllättynyt	Surprised	Surprise	.303	.473 (.421)
Keskittynyt	Concentrating	Attentiveness		.458 (.484)
Tarkkaavainen	Attentive	Attentiveness, PA		.433 (.444)
Ahdistunut	Distressed	NA	.776 (.801)	(-.281)

Note. Loadings below .25 not shown. EFA = Exploratory factor analysis. Pattern matrix loadings in regular font, structure matrix loadings in brackets.

Table 3

Pattern and Structure Matrix of Final Solution in the State Condition

Translated item	PANAS-X equivalent	PANAS-X scale	Factor 1: NA	Factor 2: PA
Ahdistunut	Distressed	NA	.777 (.806)	(-.299)
Peloissaan	Scared	Fear, NA	.764 (.777)	(-.325)
Lannistunut	Blue	Sadness	.741 (.751)	
Pelokas	Afraid	Fear, NA	.734 (.748)	(-.283)
Häpeissään	Ashamed	Guilt, NA	.724 (.738)	(-.309)
Inhon tunne	Loathing	Hostility	.722 (.737)	
Vihainen itselleen	Angry at self	Guilt	.720 (.724)	
Tyytymätön itseensä	Dissatisfied with self	Guilt	.704 (.716)	
Hermostunut	Nervous	Fear, NA	.702 (.708)	(-.256)
Itseinhon tunne	Disgusted with self	Guilt	.684 (.699)	
Epävarma	Shaky	Fear	.680 (.692)	
Pelästynyt	Frightened	Fear	.677 (.679)	
Moitittava	Blameworthy	Guilt	.672 (.657)	
Jännittynyt	Jittery	Fear, NA	.668 (.656)	
Poissa tolaltaan	Upset	NA	.667 (.652)	
Vihainen	Angry	Hostility	.659 (.650)	

Table 3 (continued)

Surullinen	Sad	Sadness	.632 (.639)	
Vihamielinen	Hostile	Hostility, NA	.617 (.616)	
Arka	Timid	Shyness	.610 (.608)	
Hämillään	Sheepish	Shyness	.610 (.602)	
Ärsyyntynyt	Irritable	Hostility, NA	.602 (.602)	
Syyllinen	Guilty	Guilt, NA	.601 (.593)	
Vastenmielisyyden tunne	Disgusted	Hostility	.567 (.576)	
Ujo	Shy	Shyness	.536 (.520)	
Yksinäinen	Lonely	Sadness	.490 (.514)	
Innostunut	Enthusiastic	Joviality, PA		.863 (.852)
Eläväinen	Lively	Joviality	(-.264)	.778 (.785)
Energinen	Energetic	Joviality		.763 (.772)
Iloinen	Joyful	Joviality	(-.306)	.740 (.771)
Rohkea	Bold	Self-assurance		.710 (.706)
Kiinnostunut	Interested	Pa		.692 (.704)
Toimelias	Active	Pa		.690 (.691)
Päättäväinen	Determined	Attentiveness		.679 (.685)
Ilahtunut	Delighted	Joviality		.676 (.682)

Table 3 (continued)

Valpas	Alert	Attentiveness, PA	(-.266)	.622	(.650)
Vahva	Strong	Self-Assurance, PA		.622	(.616)
Hilpeä	Cheerful	Joviality		.604	(.610)
Uskalias	Daring	Self-Assurance		.571	(.557)
Haltioitunut	Inspired	PA		.567	(.537)
Ylpeä	Proud	Self-Assurance, PA		.511	(.498)
Keskittynyt	Concentrating	Attentiveness		.475	(.496)
Tarkkaavainen	Attentive	Attentiveness, PA		.445	(.451)

Note. Loadings below .25 not shown. EFA = Exploratory factor analysis. Pattern matrix loadings in regular font, structure matrix loadings in brackets.

difference of |.108| in specific item loading, for the NA factor items, and an average absolute difference of .035, with a maximum difference of |.093| in specific item loading, for the PA factor items.

3.1.2 Trait data. As in the state data, the eigenvalue-greater-than-one rule and the parallel analysis indicated retention of 10, and 7 factors, respectively. The scree test indicated extraction of three factors. The three first eigenvalues were 16.61, 7.95 and 2.88, and changes in the following seven eigenvalues were comparably small, ranging from 2.00 to 1.03. As in the state data, focus was limited to closer inspection of the solutions specifying two, three and four factors.The solution specifying two factors accounted for 41.2% of the variance in the trait data. After rotation, each factor accounted for 24.4% and 16.8% of the variance, respectively. The first factor was identified as NA, containing all 10 NA scale items, as well as all 22 included items belonging to the Basic Negative Emotion Scales. The second factor was identified as PA, and contained all 9 included PA scale items ("innokas"- "excited" was removed due to multicollinearity), as well as all 17 included items from the Basic Positive Emotion Scales. The two-factor varimax solution suggested approximate simple structure, with only ten items exhibiting cross-loadings above |.25|, yet below |.40|.

The three-factor solution accounted for 45.4% of the variance, with each rotated factor accounting for 22.2%, 15.7%, and 7.5% respectively. The first factor was identified as NA, containing all 10 NA scale items, as well as all items belonging to the Basic Negative Emotion Scales included in the EFA of trait data. The second factor was identified as PA, containing all 9 included PA scale items, and 15 items belonging to the Basic Positive Emotion Scales. The third factor was identified as a bipolar shyness versus self-assurance factor. Of the five items that had their highest loading on this factor three were from the PANAS-X Shyness-scale and had positive loadings on the third factor, and two belonged to the Self-Assurance-scale, and had negative loadings. All of these five items also had secondary loadings on the first or second factor above |.25|, ranging from .26 to .49.

The four-factor solution accounted for 48.1% of the variance, with each rotated factor accounting for 22.7%, 14.9%, 7.1%, and 3.4%, respectively. The first factor was identified as NA, containing all 10 NA scale items, as well as all items belonging to the Basic Negative Emotion Scales. The second factor was identified as PA, containing all 9 PA scale items, and 13 items belonging to the Basic Positive Emotion Scales. As in the three-factor solution, the third factor in the four-factor solution, was identified as a bipolar shyness versus self-assurance factor. All seven items that had their highest loading on the third factor exhibited

considerable cross-loadings. Three of these items stemmed from the PANAS-X Shyness-scale, and had positive loadings on the third factor, while the remaining four items were from the Self-Assurance- scale, and exhibited negative loadings. The fourth factor was identified as a serenity factor. The three items that had their highest loading on the fourth factor stemmed from the PANAS-X Serenity-scale, and had high primary loadings of .57, .63, and .66, and two secondary loadings above |.25|, yet below .32, on the second factor.

As in the state data, each of the examined solutions in the trait data, showed that the two first factors, identified as NA and PA, accounted for most of the variance, even after rotation. The additional variance accounted for by the three and four factor solutions was comparably small. Also, the additional factors seemed to specify more specific factors from the PANAS-X scale. The two-factor structure was also the only one implying approximate simple structure. Thus, as in the state data, the two-factor solution was retained and further investigated.

Next, we requested an oblique rotation of the two-factor solution. Again, although the initially obtained factor correlation of -.208 was markedly lower than the |.32| cutoff recommended by Tabachnick and Fidel (2013) for retaining an oblique versus an orthogonal rotation (p.651), we chose to retain this solution. Rotation was deemed adequate, since highly correlated items loaded on the same factor, but as in the state data, examination of the factor plot indicated suboptimal distance and clustering. The pattern and structure matrices for this preferred EFA solution of trait data is presented in Table 4.

A total of 57 items were initially subjected to EFA of the trait data. Of these, four items had extracted communalities below .20 in the preferred solution and were removed. Next, examining the pattern matrix, we removed items with loadings below |.40|, and items with secondary loadings above |.25|, resulting in removal of another six items. The pattern and structure matrices of the final solution after item removal can be seen in Table 5. After removal of poorly performing items, the correlation between the two factors was -.279, and the two factors now accounted for 45.2% of the variance in the trait data. Also, the factor plot now indicated good distance and clustering.

Internal replicability analyses revealed that the final solution in the trait data, specifying two factors containing 30 and 17 items, respectively, using PAF with oblique rotation, also exhibited strong replication (Osborne, 2014). All items were structurally

Table 4

Pattern and Structure Matrices of the Preferred EFA Solution in the Trait Condition

Translated item	PANAS-X equivalent	PANAS-X scale	Factor 1: NA	Factor 2: PA
Ahdistunut	Distressed	NA	.779 (.801)	(-.268)
Lannistunut	Blue	Sadness	.750 (.783)	(-.315)
Hermostunut	Nervous	Fear, NA	.748 (.743)	
Häpeissään	Ashamed	Guilt, NA	.746 (.746)	
Epävarma	Shaky	Fear	.740 (.760)	(-.252)
Jännittynyt	Jittery	Fear, NA	.732 (.712)	
Vihainen itselleen	Angry at self	Guilt	.727 (.746)	
Peloissaan	Scared	Fear, NA	.718 (.718)	
Itseinhon tunne	Disgusted with self	Guilt	.718 (.743)	(-.272)
Tyytymätön itseensä	Dissatisfied with self	Guilt	.707 (.747)	(-.341)
Pelokas	Afraid	Fear, NA	.703 (.707)	
Alakuloinen	Downhearted	Sadness	.700 (.745)	(-.361)
Pelästynyt	Frightened	Fear	.698 (.673)	
Inhon tunne	Loathing	Hostility	.691 (.700)	
Moitittava	Blameworthy	Guilt	.677 (.691)	
Surullinen	Sad	Sadness	.665 (.682)	

Table 4 (continued)

Vastenmielisyyden tunne	Disgusted	Hostility	.658 (.682)	(-.254)
Syyllinen	Guilty	Guilt, NA	.649 (.647)	
Ärsyyntynyt	Irritable	Hostility, NA	.648 (.642)	
Poissa tolaltaan	Upset	NA	.627 (.617)	
Hämillään	Sheepish	Shyness	.619 (.576)	
Vihainen	Angry	Hostility	.615 (.594)	
Arka	Timid	Shyness	.598 (.613)	
Vihamielinen	Hostile	Hostility, NA	.558 (.561)	
Ujo	Shy	Shyness	.525 (.539)	
Yksinäinen	Lonely	Sadness	.483 (.529)	(-.318)
Kaino	Bashful	Shyness	.455 (.450)	
Väsynyt	Tired	Fatigue	.447 (.484)	(-.269)
Unelias	Drowsy	Fatigue	.433 (.459)	
Hidas	Sluggish	Fatigue	.417 (.452)	(-.257)
Ylimielinen	Scornful	Hostility	.268 (.251)	
Innostunut	Enthusiastic	Joviality, PA		.798 (.784)
Energinen	Energetic	Joviality	(-.307)	.751 (.782)
Eläväinen	Lively	Joviality		.735 (.734)

Table 4 (continued)

Kiinnostunut	Interested	PA		.734 (.731)
Iloinen	Joyful	Joviality	(-.258)	.716 (.739)
Ilahtunut	Delighted	Joviality		.696 (.685)
Toimelias	Active	PA		.653 (.670)
Päättäväinen	Determined	Attentiveness, PA	(-.288)	.636 (.669)
Hilpeä	Cheerful	Joviality		.620 (.616)
Rohkea	Bold	Self-Assurance	(-.280)	.615 (.647)
Valpas	Alert	Attentiveness, PA		.610 (.612)
Haltioitunut	Inspired	PA		.595 (.549)
Keskittynyt	Concentrating	Attentiveness		.595 (.614)
Onnellinen	Happy	Joviality	(-.354)	.578 (.627)
Vahva	Strong	Self-Assurance, PA	(-.327)	.555 (.599)
Uskalias	Daring	Self-Assurance		.553 (.563)
Itsevarma	Confident	Self-Assurance	-.339 (-.452)	.547 (.617)
Tarkkaavainen	Attentive	Attentiveness, PA		.545 (.552)
Yllättynyt	Surprised	Surprise	.381 (.279)	.490 (.410)
Hämmästynyt	Amazed	Surprise	.433 (.338)	.459 (.369)
Ällistynyt	Astonished	Surprise	.425 (.336)	.426 (.337)

Table 4 (continued)

Levollinen	At ease	Serenity	(-.281)	.389 (.431)
Ylpeä	Proud	Self-Assurance, PA		.378 (.370)
Peloton	Fearless	Self-Assurance	(-.310)	.364 (.413)
Rentoutunut	Relaxed	Serenity	(-.283)	.338 (.382)
Rauhallinen	Calm	Serenity		(.269)
Tarkkaavainen	Attentive	Attentiveness, PA		.545 (.552)

Note. Loadings below .25 not shown. EFA = Exploratory factor analysis. Pattern matrix loadings in regular font, structure matrix loadings in brackets.

Table 5

Pattern and Structure Matrix of Final Solution in the Trait Condition

Translated item	PANAS-X equivalent	PANAS-X scale	Factor 1: NA	Factor 2: PA
Ahdistunut	Distressed	Na	.799 (.812)	(-.270)
Hermostunut	Nervous	Fear, Na	.757 (.794)	(-.342)
Lannistunut	Blue	Sadness	.757 (.764)	(-.262)
Häpeissään	Ashamed	Guilt, Na	.756 (.760)	(-.348)
Epävarma	Shaky	Fear	.750 (.757)	(-.386)
Jännittynyt	Jittery	Fear, Na	.742 (.754)	(-.263)
Vihainen itselleen	Angry at self	Guilt	.738 (.754)	(-.282)
Itseinhon tunne	Disgusted with self	Guilt	.732 (.747)	
Peloissaan	Scared	Fear, Na	.730 (.737)	
Tyytymätön itseensä	Dissatisfied with self	Guilt	.719 (.720)	
Pelokas	Afraid	Fear, Na	.714 (.709)	
Inhon tunne	Loathing	Hostility	.706 (.708)	
Alakuloinen	Downhearted	Sadness	.704 (.703)	
Pelästynyt	Frightened	Fear	.696 (.693)	
Moitittava	Blameworthy	Guilt	.681 (.692)	
Surullinen	Sad	Sadness	.677 (.687)	(-.274)

Table 5 (continued)

Syyllinen	Guilty	Guilt, NA	.662	(.659)		
Vastenmielisyyden tunne	Disgusted	Hostility	.662	(.651)		
Ärsyyntynyt	Irritable	Hostility, NA	.658	(.642)		
Vihainen	Angry	Hostility	.634	(.615)		
Poissa tolaltaan	Upset	NA	.628	(.611)		
Arka	Timid	Shyness	.604	(.598)		
Hämillään	Sheepish	Shyness	.603	(.562)		
Vihamielinen	Hostile	Hostility, NA	.564	(.549)		
Ujo	Shy	Shyness	.531	(.544)		
Yksinäinen	Lonely	Sadness	.488	(.544)		(-.337)
Kaino	Bashful	Shyness	.459	(.491)		(-.300)
Väsynyt	Tired	Fatigue	.442	(.462)		(-.252)
Unelias	Drowsy	Fatigue	.425	(.461)		(-.300)
Hidas	Sluggish	Fatigue	.409	(.448)		
Innostunut	Enthusiastic	Joviality, PA		(-.334)	.829	(.810)
Energinen	Energetic	Joviality			.777	(.800)
Eläväinen	Lively	Joviality		(-.282)	.763	(.756)
Kiinnostunut	Interested	PA			.751	(.754)

Table 5 (continued)

Iloinen	Joyful	Joviality		.735 (.739)
Toimelias	Active	PA		.735 (.739)
Ilahtunut	Delighted	Joviality	(-.305)	.694 (.686)
Päättäväinen	Determined	Attentiveness, PA		.651 (.674)
Hilpeä	Cheerful	Joviality	(-.374)	.627 (.629)
Valpas	Alert	Attentiveness, PA	(-.297)	.621 (.628)
Keskittynyt	Concentrating	Attentiveness		.598 (.616)
Rohkea	Bold	Self-Assurance		.591 (.616)
Haltioitunut	Inspired	PA		.585 (.615)
Onnellinen	Happy	Joviality	(-.346)	.569 (.587)
Tarkkaavainen	Attentive	Attentiveness, PA		.566 (.567)
Uskalias	Daring	Self-Assurance		.539 (.549)
Vahva	Strong	Self-Assurance, PA		.532 (.523)

Note. Loadings below .25 not shown. EFA = Exploratory factor analysis. Pattern matrix loadings in regular font, structure matrix loadings in brackets.

assigned to the same factors as in the final solution, and the mean absolute difference in factor loadings was .037, with a maximum difference of |.104| in specific item loading, for the NA factor items, and mean absolute difference of .048, with a maximum difference of |.106| in specific item loading, for the PA factor items.

3.1.3 Construct validity. Using regression-based factor scores retained from the final EFA solutions, the construct validity of the PA and NA factors, separately for state and trait data, was primarily assessed by examining correlations with RBDI and RSES, and also with the eight additional, unstandardized measures. As can be seen in Table 6, the PA and NA factors exhibited the expected concurrent and divergent patterns of correlation, with both the state and trait PA factor scores being weakly to moderately negatively correlated with the RBDI-depression score, moderately positively correlated with the RBDI-self-esteem score, and weakly positively correlated with the RSES score. In contrast, the NA factor scores were moderately positively correlated with the RBDI-depression score, and moderately negatively correlated with both RBDI-self-esteem and RSES scores. The eight additional measures also largely exhibited the expected pattern of correlations.

There was also evidence for the validity of the distinction between state and trait measures of PA and NA. First, the RSES had higher correlations with both trait PA and trait NA factor scores, than the corresponding state factor scores. Second, the question measuring current mood also exhibited the expected pattern of correlations, that is, higher correlations with state PA and NA factor scores, than with the trait factor scores. Third, the six questions measuring stress, QoL and SWL, were composed of three question pairs, with one question measuring the current, that is, state attribute, and one measuring the same attribute during the last 12-months, thus measuring a trait-like property. These measures also largely exhibited the expected pattern of correlations with state and trait PA and NA, respectively.

3.1.4 Comparisons of pattern matrix loadings. Comparisons between the final EFA solutions in state and trait conditions indicated only minor differences in the two solutions. The final solutions contained 42 items in the state condition and 47 items in the trait condition, and comparisons of pattern matrix loadings, using the 41 matched items found in both conditions, resulted in a mean absolute difference of .03 in factor loadings.

Table 6

Correlations between factor scroes and Validity Measures.

	PA factor		NA factor	
Measure	state	trait	state	trait
RBDI-depression	-.384	-.467	.619	.603
RBDI-self-esteem	.475	.538	-.548	-.587
RSES-total	.356	.452	-.491	-.558
Stress - current	-.192	-.141	.423	.328
Stress - 12 months	-.083	-.128	.271	.336
QOL - current	.351	.379	-.403	-.366
QOL - 12 months	.236	.306	-.358	-.379
Satisfaction with life - current	.405	.432	-.482	-.416
Satisfaction with life - 12 months	.263	.375	-.335	-.376
Current state of health	.201	.261	-.224	-.270
Current mood	.423	.384	-.559	-.465

Note. RBDI = Raitasalo-Beck Depression index; RSES = Rosenberg Self-esteem Scale; QOL = Quality of Life; current = questions measuring the state level of the attribute; 12 months = questions measuring the level of the attribute during the last 12 months,. All correlations significant at .01 level, two-sided, using Pearson's correlation and bootstrapping procedure.

3.1.5 Multivariate outliers. To examine the effect of the 47 identified multivariate outliers on the results of the EFA, we also conducted an EFA, both for state and trait data, on a subsample of 770 participants, excluding the multivariate outliers. Replicating the EFA procedure presented above, the final solutions were nearly identical. In the state data, the resulting two-factor solution yielded the same 42 items in the state condition and the same 47 items in the trait condition after item removal. The mean absolute difference in factor loadings was .011, with a maximum difference of |.047|, in the state data. The corresponding values in the trait data were .010 and |.032|. Hence, it was concluded that the multivariate outliers did not affect the results of the EFA in either the state or trait data.

3.2 The Finnish Measure of PA and NA

3.2.1 Construction of the FiPANA. The selection of 20 items for the FiPANA was guided by the size of the item loadings across both state and trait data. Since the final solutions in the state and trait data contained 42 and 47 items, respectively, mean item loadings, using pattern matrix loadings across state and trait data, were only calculated for 25 matched NA factor items and 16 matched PA factor items. The 10 highest item loading means ranged between .79 and .71 for the NA factor items, and between .85 and .62 for the PA factor items. The final FiPANA items are listed in Table 7.

Additional EFA of the FiPANA verified the intended two-factor structure in both state and trait data. The scree test clearly indicated two factors in both state and trait data, and although the eigenvalue-greater-than-one rule indicated extraction of three factors in the state data, the third eigenvalue of 1.015 only marginally exceeded one. In the trait data, only the first two eigenvalues were greater than 1. Using PAF extraction and oblique rotation, the two factors accounted for 54% of the variance in the state data, and 58% in the trait data. The correlation between the two factors was -.281 in the state data, and -.263 in the trait data. All items loaded on the designated factor in both state and trait versions of the FiPANA.

As in the PANAS, the FiPANA scores are calculated by summing item scores separately for the PA scale items and the NA scale items. While the total FiPANA-PA scores were approximately normally distributed both in the state and trait data, the total FiPANA-NA scores were clearly non-normally distributed, with skewness of 1.28 (SE = .086) and kurtosis of 1.34 (SE = .086) in the state data, and skewness of 1.02 (SE = .086) and kurtosis of 1.03 (SE = .171) in the trait data.

The mean FiPANA-PA scale total score was significantly higher in the trait data, M = 34.1; SD = 6.99, than in the state data, M = 27.8; SD = 7.87; $t(816) = 26.233$; $p < .001$; d = 0.92. This was also true for the FiPANA-NA scale total score, although the difference was decidedly smaller, trait data: M = 19.6; SD = 7.36; state data: M = 18.2; SD = 7.72; $t(816)$ = 7.175; $p < .001$; d = 0.25.

Table 7

The 20 FiPANA items, and their PANAS-X equivalents and PANAS-X-scale classifications.

FiPANA item	PANAS-X equivalent	PANAS-X scale
PA-items:		
eläväinen	lively	Joviality
energinen	energetic	Joviality
ilahtunut	delighted	Joviality
iloinen	joyful	Joviality
innostunut	enthusiastic	Joviality, PA
kiinnostunut	interested	PA
päättäväinen	determined	Attentiveness, PA
rohkea	bold	Self-Assurance
toimelias	active	PA
valpas	alert	Attentiveness, PA
NA-items:		
ahdistunut	distressed	NA
lannistunut	blue	Sadness
peloissaan	scared	Fear, NA
häpeissään	ashamed	Guilt, NA
hermostunut	nervous	Fear, NA
vihainen itselleen	angry at self	Guilt
pelokas	afraid	Fear, NA
epävarma	shaky	Fear
inhon tunne	loathing	Hostility
tyytymätön itseensä	dissatisfied with self	Guilt

Note. PANAS-X = Positive and Negative Affect Schedule – Expanded Form (Watson & Clark, 1994); Items belonging to the PANAS-X PA- and NA-scales are items used in the original PANAS (Watson, Clark, & Tellegen, 1988).

3.2.2 Construct validity and reliability of the FiPANA. Correlations of the FiPANA-NA and -PA scales with the RBDI scales and the RSES scale, as well as the eight additional validity measures, can be seen in Table 8. The pattern of correlations was nearly identical to those found in examinations of factorial validity, suggesting that the FiPANA does indeed measure both state and trait PA and NA. Internal consistency reliability (Cronbach's alpha) was high overall, with α = .92 and α=.93 for state and trait NA, respectively, and α = .92 and α = .91, for state and trait FiPANA-PA, respectively.

Table 8

Correlations of FPN PA and NA Scale Total Scores with Validity Measures.

	FPN PA		FPN NA	
Measure	state	trait	state	trait
RBDI-depression	-.383	-.449	.617	.605
RBDI-self-esteem	.473	.523	-.563	-.591
RSES-total	.352	.442	-.508	-.560
Stress - current	-.190	-.130	.427	.333
Stress - 12 months	-.080	-.118	.274	.333
QOL - current	.396	.413	-.485	-.403
QOL - 12 months	.256	.360	-.344	-.363
Satisfaction with life - current	.344	.372	-.393	-.352
Satisfaction with life - 12 months	.231	.301	-.351	-.357
Current subjective health	.192	.250	-.222	-.258
Current mood	.416	.367	-.552	-.455

Note. RBDI = Raitasalo-Beck Depression index; RSES = Rosenberg Self-esteem Scale; QOL = Quality of Life;

All correlations significant at .01 level, two-sided, using Pearson's correlation and bootstrapping procedure.

3.2.3 Comparisons with the original PANAS. The following analyses were conducted in order to better be able to compare the current sample to samples from previous studies, and also to compare the performance of the FiPANA to that of the translated PANAS items. This comparison was accomplished by first calculating the PA and NA scale total scores for both the items that constitute original PANAS, and the newly developed FiPANA. Correlations of the FiPANA-PA and -NA scale total scores, and the corresponding total scores of the translated items included in the PANAS PA- and NA-scales, with the regression-based factor scores derived from the preferred EFA solution indicated very small differences between the FiPANA and the translated PANAS items in their ability to measure the latent PA and NA dimensions. As can be seen in Table 9, correlations between PA factor scores and FiPANA-PA scale scores were only marginally higher compared to corresponding correlations with the translated PANAS-PA scale scores. The same pattern is evident for NA, as well, and in both state and trait measures.

Table 9

Correlations between regression-based factor scores of final EFA solutions and FiPANA total scores as well as total scores of items constituting the original PANAS.

	State Factors		Trait Factors	
Measure	NA	PA	NA	PA
FiPANA State NA total score	.976	-.290	.717	-.290
FiPANA Trait NA total score	.712	-.242	.979	-.316
FiPANA State PA total score	-.240	.989	-.216	.588
FiPANA Trait PA total score	-.262	.579	-.301	.988
PANAS State NA total score	.963	-.185	.656	-.214
PANAS Trait NA total score	.686	-.166	.956	-.217
PANAS State PA total score	-.206	.950	-.179	.552
PANAS Trait PA total score	-.221	.557	-.256	.950

Note. NA = Negative Affect; PA = Positive Affect; FiPANA = Finnish Measure of Positive and Negative Affect; PANAS = Posivite and Negative Affect Schedule (Watson); State Factors = Factors from final EFA of state data; Trait Factors = Factors from final EFA of traid. All correlations significant at .01 level, two-sided, using Pearson's correlation and bootstrapping procedure.

Due to these findings, further analyses were conducted using the 20 translated original PANAS items, so as to examine the factorial structure and reliability of this alternative set of translated items. This EFA clearly revealed a two-factor structure in both state and trait conditions. All items loaded on the intended factor (Watson et al., 1988). The correlation between PA and NA was -.151 in the state data, and -.164 in the trait data. The reliability for the translated items included in the PANAS PA- and NA-scales were also calculated to allow for comparison to the FiPANA, and were α = .89 (state PA), α = .91 (trait PA), α = .88 (state NA), and α = .88 (trait NA).

3.2.4 FiPANA Norms. Since the statistically significant associations between age and the state and trait FiPANA-PA and -NA scores, respectively, were very weak, in that all correlations were < |.15|, separate age-specific norms were not produced. To determine whether to produce gender-specific norms for the FiPANA gender-related differences in FiPANA-PA and –NA scores were examined. Due to the non-normal distribution of the FiPANA-NA total scores, gender differences in FiPANA-PA and -NA scale total scores were calculated using the Welch t-test and bootstrapping procedure using 2000 samples. The difference in state FiPANA-PA scores between men and women was non-significant, $t(306.415) = -1.21$, $p = .242$. However, comparisons of trait FiPANA-PA scores revealed that women had significantly higher scores, $M = 34.39$, $SD = 6.92$, than men, $M = 32.94$, $SD = 6.92$, $t(263.566) = 2.38$, $p = .018$, $d = 0.21$. Women also had significantly higher state FiPANA-NA scores, $M = 18.57$, $SD = 7.93$, compared to men, $M = 16.76$, $SD = 6.69$, $t(311.465) = 3.03$, $p = .004$, $d = 0.24$, as well as higher trait FiPANA-NA scores, women: $M = 20.20$, $SD = 7.43$; men: $M = 17.26$, $SD = 6.58$; $t(297.768) = 5.06$, $p < .000$, $d = .41$. Due to these results, gender-specific norms were produced, and are presented in Table 10 and Table 11.

Table 10

General and gender specific norms for the State-FiPANA scales.

	General		Male		Female	
Raw score	PA %ile	NA %ile	PA %ile	NA %ile	PA %ile	NA %ile
1	< 1	< 5	< 1	< 7	< 2	< 5
2	< 1	< 5	< 1	< 7	< 2	< 5
3	< 1	< 5	< 1	< 7	< 2	< 5
4	< 1	< 5	< 1	< 7	< 2	< 5
5	< 1	< 5	< 1	< 7	< 2	< 5
6	< 1	< 5	< 1	< 7	< 2	< 5
7	< 1	< 5	< 1	< 7	< 2	< 5
8	< 1	< 5	< 1	< 7	< 2	< 5
9	< 1	< 5	< 1	< 7	< 2	< 5
10	1	5	1	7	< 2	5
11	1	14	1	19	< 2	13
12	2	24	2	31	2	22
13	3	32	3	39	3	30
14	4	39	3	46	4	38
15	5	45	3	55	6	43
16	7	51	4	60	8	49
17	9	56	5	63	11	55
18	12	61	7	66	14	60
19	15	65	8	69	17	63
20	18	68	11	73	20	67
21	22	72	15	79	24	70
22	26	75	19	82	27	73
23	29	78	22	84	31	77
24	33	81	25	85	35	79
25	37	83	30	87	39	82
26	42	85	36	89	44	84
27	47	87	44	91	48	86
28	53	89	50	92	53	88
29	57	90	55	94	57	89

Table 10 (continued)

	General		Male		Female	
Raw score	PA %ile	NA %ile	PA %ile	NA %ile	PA %ile	NA %ile
30	60	91	60	95	60	90
31	65	93	67	97	64	92
32	69	94	72	97	69	92
33	74	94	76	98	73	93
34	78	95	80	98	78	94
35	82	96	83	98	81	95
36	84	97	86	98	83	96
37	87	97	90	99	86	96
38	89	98	93	99	89	97
39	93	98	94	99	92	98
40	95	98	96	99	95	98
41	96	99	96	>99	96	99
42	97	99	96	>99	97	99
43	98	>99	98	>99	97	99
44	98	>99	98	>99	98	99
45	99	>99	99	>99	99	99
46	>99	>99	99	>99	99	99
47	>99	>99	99	>99	>99	99
48	>99	>99	99	>99	>99	>99
49	>99	>99	>99	>99	>99	>99
50	>99	>99	>99	>99	>99	>99

Note. Raw score = FiPANA raw scores; PA = Positive affect; NA = Negative affect; %ile = percentile.

Table 11

General and gender specific norms for the Trait-FiPANA scales.

	General		Male		Female	
Raw score	PA %ile	NA %ile	PA %ile	NA %ile	PA %ile	NA %ile
1	< 1	< 3	< 1	< 6	< 1	< 2
2	< 1	< 3	< 1	< 6	< 1	< 2
3	< 1	< 3	< 1	< 6	< 1	< 2
4	< 1	< 3	< 1	< 6	< 1	< 2
5	< 1	< 3	< 1	< 6	< 1	< 2
6	< 1	< 3	< 1	< 6	< 1	< 2
7	< 1	< 3	< 1	< 6	< 1	< 2
8	< 1	< 3	< 1	< 6	< 1	< 2
9	< 1	< 3	< 1	< 6	< 1	< 2
10	< 1	3	< 1	6	< 1	2
11	1	9	< 1	16	1	7
12	1	15	< 1	23	1	13
13	1	21	1	32	2	18
14	2	27	1	41	2	23
15	2	32	2	48	2	28
16	2	38	2	53	2	34
17	2	43	2	57	2	40
18	3	49	3	61	3	46
19	4	55	3	66	4	52
20	4	60	4	71	5	57
21	5	64	5	75	5	61
22	7	69	8	79	6	66
23	8	73	11	83	8	70
24	10	76	14	87	9	73
25	11	80	16	89	10	77
26	13	83	19	92	12	80
27	15	85	22	94	14	83
28	17	87	25	94	15	85
29	20	90	28	95	18	88

Table 11 (continued)

	General		Male		Female	
Raw score	PA %ile	NA %ile	PA %ile	NA %ile	PA %ile	NA %ile
30	25	92	33	96	23	91
31	29	93	37	96	27	92
32	34	94	41	96	32	93
33	39	95	46	96	37	94
34	46	96	54	98	44	96
35	53	97	61	98	50	96
36	58	97	67	99	56	96
37	64	98	71	99	62	97
38	70	98	75	99	69	98
39	76	98	80	99	75	98
40	82	98	85	99	81	98
41	86	99	88	99	85	99
42	89	99	91	99	88	99
43	92	99	94	99	92	99
44	95	>99	95	>99	95	99
45	97	>99	97	>99	97	>99
46	98	>99	98	>99	98	>99
47	99	>99	99	>99	99	>99
48	99	>99	99	>99	99	>99
49	>99	>99	>99	>99	>99	>99
50	>99	>99	>99	>99	>99	>99

Note. Raw score = FiPANA raw scores; PA = Positive affect; NA = Negative affect; %ile = percentile.

4 Discussion

The main objective of this study was to develop a brief-format Finnish measure of PA and NA, similar to the 20-item PANAS, developed by Watson et al. (1988). To our best knowledge, there is still no standardized measure of self-reported PA and NA in Finnish. Considering previous studies suggesting cultural variability in how well specific PANAS items measure the PA and NA dimensions (e.g. Joiner et. al, 1997; Thompson, 2007), and studies indicating inconsistencies in PANAS factor structure (e.g. Crawford & Henry, 2004; Gaudreau et al., 2006; Mehrabian, 1997), our concern was that simply translating the PANAS into Finnish might result in a suboptimal measure of PA and NA.

As an initial step in the development of the FiPANA, the structure of general affect in the current sample was explored using the 60 double-back translated PANAS-X mood terms. Based on the results from separate EFA:s of state and trait data that both indicated two dominant factors clearly identified as PA and NA, the Finnish measure of positive and negative affect, named the FiPANA, was developed by identifying the strongest markers of PA and NA, across state and trait data. The resulting 20-item FiPANA was found to be a valid measure of both state and trait PA and NA, exhibiting the expected pattern of correlations with validity measures. The increase in mean FiPANA-PA and -NA scores, when moving from state to trait FiPANA measures, is comparable to findings in previous studies of the PANAS (Terracciano et al., 2003; Watson et al., 1988), and gives further support for the validity of measuring state and trait affectivity separately using the FiPANA.

4.1 The FiPANA

The FiPANA was, however, found to be only marginally better at measuring the latent PA and NA dimensions, compared to using the set of translated items that constitute the original 20-item PANAS, when comparing correlations of the PA- and NA-scale total scores with the PA and NA factor scores. Considering that the FiPANA and the PANAS share 50% of their items, that is, the FiPANA-PA scale contains five translated items from the PANAS-PA scale, and the FiPANA-NA scale contains 5 translated items from the PANAS-PA scale, the results are less surprising. Further examinations of the preferred EFA solutions in both state and trait data also revealed that the differences in the size of average item factor loadings, when comparing items included in the FiPANA and items included in the PANAS, were rather small. Also, even though the internal consistency reliability coefficients for the FiPANA-PA and -NA scales were somewhat higher compared to those of the translated items included in the PANAS PA- and NA- scales, the reliability of all subscales was high, that is,

approximately .9. Taken together, these results suggest that both the FiPANA and the set of translated PANAS items can be seen as adequate measures of PA and NA, at least in the current sample of Finnish adults.

However, a few of the translated items included in the PANAS, but not in the FiPANA, exhibited some problematic psychometric characteristics. While all translated PANAS-NA items were strong and pure measures of NA in both state and trait data, there were issues with three PANAS-PA items. First, as in the preliminary factorial analyses using the PANAS-X items, the items "*innostunut*" (enthusiastic) and "*innokas*" (excited) exhibited multicollinearity in both state and trait data, suggesting that the two terms were very closely related, and consequently that one of the items should be considered redundant in the Finnish translation. This finding may either reflect possible differences in Finnish and English language, or simply be a result of the current translation, but it indicates that alternative translations of the two terms into Finnish might better capture and convey the inherent difference in meaning between the two English words. That being said, it is important to point out that the English version of the PANAS also has repeatedly been criticized for containing redundant items (e.g., Crawford & Henry, 2004; Gaudreau et al., 2006; Thompson, 2007).

Another issue with the translated PANAS-PA items concerns the item "*ylpeä*" (proud), which was identified as a moderately strong measure of state PA, but a weak measure of trait PA, based on the size of item loadings in the preferred EFA solutions. Further, comparison of the factor loadings from the initial *varimax* rotated two-factor solution with the corresponding loadings presented in the original PANAS paper (Watson et al., 1988) showed a difference of nearly .2 in rotated factor loadings, thus indicating that the item may be performing worse than intended in the current sample. These results could point to differences in how trait pride is perceived in Finnish versus North-American cultures: It is possible that although shorter, situation-specific feelings of pride may be seen as quite positive in both cultures, trait pride may be seen as something less positive in Finnish culture. Studies of the perception of pride in other Nordic countries give some support for this interpretation. For example, a study by Bromgard, Trafimow, and Linn (2014), comparing interpretations of the expression of pride among Norwegian and U.S. participants, found that participants from Norway ascribed more negative trait attributions to a person expressing pride than U.S. participants. In studies specifically using the PANAS, trait pride has also previously been identified as a poor measure of PA among Spanish women (Joiner et al., 1997), and the term has also been reported to have a negative connotation in a qualitative item examination using an international sample of adults (Thompson, 2007). However, although

the item pride may have been a poor measure of trait PA in the current sample, it was nevertheless a pure measure of trait PA, with very low secondary loadings, and a good measure of state PA. All in all, these results suggest that most of the translated items that correspond to the original 20-item PANAS are reasonably good measures of PA and NA, at least in the current sample.

Although the FiPANA was developed by selecting items identified as the strongest measures of either PA or NA, and thus only contains reasonably well-performing items, there are other potential limitations. One possible consequence of a strictly data-driven approach to test development is that the resulting measure may prove to be overly narrow. Hypothetically, the subset of selected items may have strong loadings on the designated factors, yet only measure a specific facet of the intended construct, and thus fail to adequately encompass the broadness of it. However, in the case of the FiPANA, both the PA and NA scales can be considered to have broad content coverage, since they contain items from all of the PANAS-X Basic Positive Affective Scales and Basic Negative Affective Scales. The FiPANA-NA scale contains items from the Fear (4 items), Guilt (3 items), Hostility (1 item), and Sadness (1 item) scales, and the FiPANA-PA scale from the Joviality (5 items), Attentiveness (2 items), and Self-Assurance (1 item) scales. Both scales also contain items that only belong to the higher order NA-scale (1 item) or PA-scale (2 items), and are not included in the lower-order, more specific PANAS-X scales. Corresponding content analysis of the 20-item PANAS revealed that the PANAS-NA scale does not contain any items from the Sadness scale, and hence does not cover all of the PANAS-X Basic Negative Affect Scales, while the PANAS-PA scale does contain items from all of the Basic Positive Affective Scales.

A second and related problem with the current approach to developing the FiPANA is the possible inclusion of redundant items. As can be seen in the distribution of items among the lower-order PANAS-X scales presented above, the FiPANA items are unequally distributed among these scales. The inclusion of multiple items from the same scale, may be a sign of inclusion of redundant items. The high alpha values for the state and trait FiPANA-PA and -NA scales may also indicate redundancy (Taber, 2017). Such redundant items could in theory either be removed, resulting in a shorter measure, or replaced with items that might be somewhat weaker measures of PA or NA, but that nevertheless tap into other facets of these affective dimensions, resulting in a broader, and therefore more valid, measure. The use of the PANAS-X scales as a metric for redundancy of items and content coverage of the FiPANA is, of course, far from optimal, since these lower-order categories may prove to be culture-specific, or at least the precise item content may vary, making the structure identified in U.S.

samples unfitting in the current cultural context. It should also be noted that the items are not equally distributed among the lower-order PANAS-X scales, that is, the number of items contained in each lower-order scale vary, which in itself may have contributed to the unequal distribution in the FiPANA. Therefore, future studies should employ more appropriate methods for examining the content coverage of the FiPANA, e.g., by first exploring the lower-order PANAS-X categories in a Finnish sample, or by using an even larger pool of affective terms to identify the lower-order categories central to Finnish language and culture.

It is important to note that the differences in content between the PANAS and the FiPANA cannot be said to directly reflect cultural differences, due to the fact that the measures have been developed in somewhat different ways. While the FiPANA has been developed in a more data-driven manner, by selecting items purely based on factor loadings, the PANAS was developed by selecting items from specific content categories identified through EFA to ensure a broad coverage of the affective space (Watson et al., 1988). Thus, the FiPANA is the result of focusing on including psychometrically sound items identified as the strongest measures of PA and NA across state and trait data as opposed to selecting items to optimize broad content coverage.

In sum, the current study indicated that both the FiPANA and the translated PANAS items were largely comparable measures of PA and NA, and that both sets of items, despite their limitations, seem to be valid candidates for measuring PA and NA in a Finnish population. Future studies should aim at further examining and comparing the FiPANA and the translated PANAS items, especially using CFA, so as to see whether the current results replicate in a separate sample, and to establish the fit of the two-factor model.

4.2 Gender-related differences

In line with previous studies of the PANAS (Crawford & Henry, 2004; Engelen et al., 2006; Terracciano et al., 2003), women had higher FiPANA-NA scores than men in both state and trait data. Regarding previous studies on gender differences in PA scores, the evidence has been mixed. Differences in PA scores have either not been found (Terracciano et al., 2003), or have run in the opposite direction, with men having had higher PA scores than women (Crawford & Henry, 2004; Engelen et al., 2006). In the present study, women had higher scores than men on trait FiPANA-PA, but there were no differences in state FiPANA-PA.

To examine whether these findings were the result of the specific set of items that constitute the FiPANA, and to improve comparison of the current sample to samples from

previous studies, the same analyses were repeated using the translated items that constitute the PANAS. These analyses revealed similar differences between men and women in state and trait NA total scores, but in contrast showed no gender-related differences in either state or trait translated PANAS-PA total scores. The results are interesting, since they suggest that scale composition can affect the degree to which gender differences are highlighted. Additional comparisons of item means are presented in Appendix C. Examining the five items unique to the PANAS-PA scale and the five items unique to the FiPANA-PA scale, it becomes evident that while nearly all unique FiPANA-PA item means are higher for women and lower for men, several among the five translated unique PANAS-items have higher means for men than women. This pattern could be explained by the uneven distribution of Joviality items: While the FiPANA-PA contains five items from the PANAS-X Joviality scale, the original PANAS only contains two. In previous analyses of gender-related differences in PANAS-X subscales, women have indeed been identified to score higher than men on Joviality in four of the ten examined samples (Watson & Clark, 1994). Although the current differences in specific item means are small, these differences add up when summing total scores, and result in patterns of gender differences unlike those found in previous studies.

Taken together, these results show that when using the translated PANAS items the current sample exhibited similar gender differences in the level of state and trait PA and NA as identified in previous studies (e.g., Terracciano et al., 2003), indicating that the sample is comparable to previously used ones. The results also suggest that the unexpected direction of the gender-related difference in trait FiPANA-PA seems to be a result of differences in PANAS and FiPANA scale contents. Due to these findings separate FiPANA gender norms were produced for men and women.

4.3 The relationship between PA and NA

In the initial EFA:s on the state and trait data conducted to explore the structure of general affect in this sample of Finnish adults using the 60 PANAS-X items, PA and NA emerged as the two dominant factors that were largely comprised of the same items, with similar factor loadings, in both data sets. The two factors exhibited the expected concurrent and divergent pattern of correlations with the validity measures, supporting the construct validity of the PA and NA factors, in both state and trait conditions. Furthermore, the content of the factors was in line with previous investigations of the PANAS-X, that is, the PA- and NA-factors in the preferred solutions only contained items from lower order PANAS-X scales

that have previously been shown to measure PA and NA (Watson, 1994). The PA and NA factors were nearly orthogonal, exhibiting only 3.0% (i.e., $-.174^2$) and 4.3% (i.e., $-.208^2$) shared variance in the state and trait data, respectively, and shared approximately 40% of the variability in the translated PANAS-X-item scores, which is in line with results from previous studies (Killgore, 2000; Tuccitto et al., 2010; Villodas et al., 2011). In addition, the EFA:s were found stable, as analyses of factorial validity indicated that the oblique two-factor solutions in both state and trait data exhibited strong replication (Osborne, 2014). Taken together, these results gave support for the conceptualization of self-reported affect, measured by the set of translated PANAS-X items, as consisting of two practically independent affective dimensions in the current sample. In comparison, EFA of the 20 FiPANA items resulted in two-factor solutions with correlations of -.281 and -.263 between the PA and NA factors in the state and trait data, respectively. So as to compare the current sample to samples used in previous studies, further EFA were also conducted, but using the 20 translated items included in the PANAS. In line with findings from previous PANAS studies (Killgore, 2000; Schmukle, Egloff, & Burns, 2002; Tuccitto et al., 2010), these analyses yielded PA-NA factor correlations of -.151 in the state data, and -.164 in the trait data. It should also be noted that the translated PANAS items, as mentioned above, contained items suffering from multicollinearity, which can be a problem in EFA (Tabachnick & Fidell, 2013), and that the analyses were nevertheless conducted including all translated PANAS items, in order to make the comparisons possible. All in all, however, these results are in line with previous findings (Killgore, 2000; Tuccitto et al., 2010; Villodas et al., 2011), and thus support the conceptualization of both state and trait PA and NA, as nearly orthogonal dimensions in the current sample of Finnish adults.

4.4 The Three- and Four-factor Solutions

Although the two-factor solution was identified as the preferred solution in EFA of both state and trait data, the three- and four-factor solutions also warrant some comment. One interesting finding was the repeated emergence of the bipolar shyness versus self-assurance factor, which was found in the four-factor solution in the state data, and in both the three- and four-factor solutions in the trait data. This factor, although not identical, could nevertheless be likened to a submissiveness-dominance dimension, that is, a potency dimension, which was considered an important affect dimension mostly in early affect theories (e.g., Osgood, Suci, & Tannenbaum, 1957; Russel & Mehrabian, 1974). A three-dimensional affect framework, consisting of pleasure, arousal, and potency is, however, still considered important by some

authors (e.g., Bakker, 2014; Detand, 2017). The Self-Assessment Manikin (Bradley & Lang, 1994) that has been developed for rating the affective properties of stimuli when creating normative stimulus databases for research purposes, such as the International Affective Picture System (IAPS; Lang & Bradley, 1997), is based on this framework. The discussion as to whether potency is a central affective dimension is clearly outside of the scope of the current dissertation, and our aim was merely to note the this finding for future reference. These results must also be taken lightly, since the factorial validity of the three- and four-factor solutions was not examined, and the stability of the solutions is thus unclear (Osborne, 2014).

4.5 Limitations

4.5.1 Response order effects. In addition to the limitations discussed above, all participants in the current study rated the 60 translated PANAS-X items two times, first according to the state and then the trait instruction. The 60 items were presented in the exact same order in both conditions. This imposes several limitations. First, because the order of the state and trait instructions was not varied, the difference between state and trait results has most likely been contaminated by order effects and survey fatigue. Although the construct validity of the state and trait factors was well established in the expected pattern of correlations between factor-scores and validity measures, such that state factors had higher correlations with state validity measures, and trait factors with trait validity measures, order effects could have been controlled for and examined by varying the order of the state and trait instructions. Second, because all participants rated all items in the same order, specific item order effects may have influenced the results (Lavrakas, 2008): The 40 items not included in the FiPANA may have affected the performance of the included items, especially since the order has not been varied, and the same items have preceded the FiPANA items, in both state and trait conditions. Thus, future studies should further examine the performance of the 20 FiPANA items, presented as such.

4.5.2 EFA. Since no prior studies have, to our knowledge, studied the structure of self-reported general affect in Finnish populations, EFA was deemed appropriate for an initial examination. It should, however, be noted that the most central aim of this study was to develop a measure of PA and NA, and that the EFA were quite restricted and to a large degree guided by theory and previous findings within the field. Although it is strongly recommended to take theory into account when conducting EFA (Osborne, 2014), our choice to limit the number of extracted factors to four was rather coarse. Future studies interested in exploring the general structure of affect in the Finnish population, using the translated PANAS-X items should instead make use of multilevel EFA or CFA. It is also important to explicitly state that due to the exploratory nature of EFA, the results from this study cannot be readily generalized to the Finnish population, until the results have been corroborated in a separate sample using CFA (Osborne, 2014; Tabachnick & Fidell, 2013). This is also why conducting a CFA was not a viable first step in the current study (Osborne, 2014; Worthington & Whittaker, 2006).

4.5.3 Validity measures. There were also notable limitations in the validity measures. The RBDI contains three scales, of which only two were used (Depression and Self-Esteem), since the third scale (Anxiety) only consists of one question. The Depression and Self-Esteem scales are, however, measured by the same thirteen questions, and are scored as follows: If participants select the first among the five presented statements, the question measures Self-Esteem, whereas selecting among statements 2-5, results in scores of 0-3 on the Depression scale. This is psychometrically quite problematic, since the test construction relies on a theoretical conceptualization of Depression and Self-Esteem being polar opposites on the same dimension: The person is either depressed or has high self-esteem. This conceptualization has not been uniformly corroborated in the literature, which indicates a more complex relationship between these constructs (Sowislo & Orth, 2013). The nature of the relationship is also likely to reflect that depression constitutes a psychiatric symptom constellation, whereas self-esteem constitutes a broader psychological construct reflecting the value we assign to ourselves. Since depression and self-esteem are separate constructs, this also violates recommendations in theories of test construction, where, optimally, each item should clearly measure a single construct (Furr, 2014).

However, a second measure of self-esteem, the RSES, was also used in the current study. Although the English RSES (Rosenberg, 1965) is a widely used measure of self-esteem, the Finnish translation of the RSES (Raitasalo, 2007) lacks, to our best knowledge, reliability and validity data. However, the correlation between the RSES and RBDI Self-

Esteem was .61, indicating moderate convergence between the two measures of self-esteem, and gives further support for the validity of both measures.

Finally, the eight additional questions measuring stress (current and during the past 12 months), QOL (current and during the past 12 months), satisfaction with life (current and during the past 12 months), current subjective health, and current mood, were constructed by the authors of this study, and were thus unstandardized. Future studies aiming at examining the validity of the PA and NA in Finnish populations, should make use of more established validity measures such as the Finnish translation of the BDI (Aromaa & Koskinen, 2002) and standardized questions measuring stress (Elo, Leppänen, & Jahkola, 2003) and QOL (Vaaramaa & Ylönen, 2006). Previous studies have also shown strong associations of PA and NA with extraversion and neuroticism (Watson, 1999), and thus well validated Finnish measures of personality (e.g., NEO-PI-3) could be also be used.

4.5.4 Sample. Due to this being a convenience sample and due to having directed data gathering efforts to university-based mailing lists, the demographic composition of this sample does not adequately reflect that of the general adult population in Finland, as the present sample predominantly consists of women and young university students, with about 85% of the participants being under 30 years of age. Also, comparisons of the education level of the current sample with Finnish national levels clearly indicated a higher educational attainment (Statistics Finland, 2016). All in all, this affects the generalizability of the results in a manner similar to previous studies conducted mainly with young adult university students (e.g., Watson, 1988, Gaudreau, 2006, and Thompson, 2007). Therefore, future studies conducted using random or stratified sampling from the general population would be warranted. Nevertheless, the current sample was large, and was adequate for the conducted statistical analyses. In addition, only self-reported psychiatrically healthy individuals were included in the current study, which also limits the generalizability of the current results to clinical populations.

4.5.5 Response rate. According to Eysenbach (2004), the term "response rate" should not be used when discussing web surveys, but instead the terms "view rate", "participation rate", and "completion rate". However, since it is not known how many persons the e-mail invitations eventually reached, these rates could not be calculated in this study. Although the E-lomake service (www.e-lomake.fi), that is, the survey tool, does keep a log of how many times a link has been opened, it is not possible to differentiate between unique visits and multiple visits by the same individual. Similarly, the service rendered it impossible to prevent the same individual from answering the questionnaire multiple times.

4.5.6 Conclusions and future directions. The main product of this dissertation was the development of the FiPANA. The resulting Finnish 20-item questionnaire was found to be a valid and reliable measure of both state and trait PA and NA in a sample mostly consisting of Finnish university students. The FiPANA was also accommodated with norms, both general and gender-specific, in order to enable interpretation of PA- and NA-scale scores. Future studies should aim at corroborating the FiPANA factor structure, preferably using CFA, and further examining the performance of the FiPANA. Additional comparisons of PA and NA levels in different Finnish populations, such as between clinical and non-clinical populations, between the young and the older, or between different Finnish minorities, e.g., between Finnish-speaker and the Swedish-speaking minority in Finland or the Sami-minority, could also be fruitful endeavors.

Swedish Summary

Utveckling av ett finskspråkigt självskattningsformulär för mätning av positiv och negativ affekt

Inom psykologin är såväl forskare som kliniker fullständigt beroende av de psykologiska mätmetoder som finns till förfogande. En typisk utmaning utanför den angloamerikanska världen, är bristen på översatta och standardiserade test. Positive and Negative Affect Schedule (PANAS), som utvecklats av Watson, Clark och Tellegen (1988), är ett exempel på ett vedertaget affektivt test som saknat tillförlitliga finskspråkiga alternativ. Därmed var syftet med denna avhandling att utveckla en finskspråkig motsvarighet till PANAS.

PANAS bygger på en tvådimensionell konceptualisering av generell affekt och mäter därmed två generella affektiva dimensioner: Positiv affekt (PA) och negativ affekt (NA). PANAS används både inom forskning, där testet under de senaste tio åren använts i mer än 450 publicerade forskningar (Seib-Pfeifer, Pugnaghi, Beauducel, & Leue, 2017), och även inom klinisk verksamhet, var testet har visats vara användbart vid diagnostisering av ångest och depression (Clark & Watson, 1991; Terracciano, McCrae, & Costa, 2003).

Det har dock antytts vissa brister i PANAS faktorstruktur (t.ex., Gaudreau, Sanchez, & Blondin, 2006; Mehrabian, 1997), samt oklarheter i faktorernas inbördes relationer (t.ex., Crawford & Henry, 2004). Utöver detta har några affekttermer visat sig vara kulturspecifika och inte utgjort effektiva mått av den affektiva dimension termen ursprungligen avsetts mäta (Joiner, Sandín, Chorot, Lostao, & Marquina, 1997; Thompson, 2007). Med dessa utmaningar i åtanke, var det inte möjligt att utföra en direkt översättning av PANAS till finska. Istället utfördes till en början en explorativ undersökning av den generella affektiva faktorstrukturen i en finskspråkig vuxenpopulation, med hjälp av ett större antal affektiva termer. Termerna togs ur en förlängd version av PANAS, nämligen PANAS-X (Watson & Clark, 1994), som består av 60 affekttermer, varav 20 är termer som utgör den ursprungliga versionen av PANAS. Utifrån resultaten i denna faktoranalys utvecklades den finskspråkiga motsvarigheten till PANAS, genom att inkludera endast de termer som i faktoranalyserna bäst representerat de identifierade affektdimensionerna. På så vis utvecklades ett möjligast tillförlitlig och ekologiskt validt finskspråkigt test av generell affektivitet.

Teori

Historiska narrativ av affekt- och emotionsforskning delar ofta upp fältet i två teoretiska huvudgrupper, nämligen kategoriska och dimensionella teorier, som ofta karikeras vara i tvär

konflikt med varandra (Barrett, 2016). Enligt kategoriska emotionsteorier är varje affektivt tillstånd karaktäriserat av en rad diskreta emotionskategorier, så kallade grundemotioner. Varje grundemotion anses bestå av en specifik upplevelse, en specifik typ av fysiologisk aktivering och medföra specifika beteendetendenser, och mer komplexa affektiva tillstånd utgör sedan kombinationer av dessa grundemotioner (Ekman, 1999).

I dimensionella teorier utgår man istället från att identifiera de mest centrala affektiva dimensionerna, som på ett meningsfullt sätt kan beskriva aspekter av diverse affektiva tillstånd (Barrett, 2016). Till exempel utgår Russell (1980) i sin dimensionella modell från följande två dimensioner: Valens, som sträcker sig från välbehag till obehag, och aktivering, som sträcker sig från låg till hög aktivering.

Under 1980-talet föreslog Watson & Tellegen (1985) ett alternativ till Russells dimensionella modell. Watson & Tellegens (1985) modell växte fram på basen av analyser av självskattad affekt, och de identifierade dimensionerna representerade positiv och negativ affektivitet. Således, istället för att dela upp affektiva upplevelser i valens och aktivering som Russell gjort (1980), byggde Watson & Tellegens (1985) modell på uppdelning i graden av positiv och negativ aktivering, och kan ses som en blandning mellan Russells (1980) valens- och aktiveringsdimensioner. NA-dimensionen sträcker sig från låg till hög negativ aktivering, medan PA-dimensionen på motsvarande sätt går från låg till hög positiv aktivering (Watson, Wiese, Vaidya, & Tellegen, 1999). Exempelvis, anses känslor som hat, äckel och förakt, ha en hög grad av negativ aktivering, och känslor som glädje och entusiasm anses utgöra känslor med hög positiv aktivering. På så sätt bildar PA och NA dimensionerna ett tvådimensionellt fält i vilket diverse emotioner kan placeras.

Utvecklingen av PANAS

För att kunna mäta dessa underliggande PA och NA dimensioner, utvecklade Watson, Clark och Tellegen (1988) PANAS. Som tidigare nämnt, består detta självskattningsformulär av 20 affektrelaterade termer. Testets två skalor, PA och NA, innehåller vardera 10 termer. PA skalan innehåller termer som alert (”*alert*”), uppmärksam (”*attentive*”) och ivrig (”*excited*”), medan NA skalan innehåller termer som rädd (”*afraid*”), upprörd (”*upset*”) och retlig (”*irritable*”). Svarspersoner ombeds uppskatta i vilken grad de upplevt var och en av de presenterade affekttermerna, på en skala från 1 (i mycket lite grad) till 5 (i mycket hög grad). Beroende på vilken tidsinstruktion som används, kan man antingen mäta temporära affektiva tillstånd (”I vilken grad upplever du följande affekter just nu?”) eller mer bestående individuella affektiva egenskaper (”I vilken grad upplever du följande affekter i allmänhet?”).

PANAS har visats ha god validitet och reliabilitet (Watson & Clark, 1994; Watson et al., 1988).

Brister i PANAS

Flera olika aspekter av PANAS har under årens gång kritiserats. Den underliggande teoretiska referensramen, med två okorrelerade generella affektdimensioner har ifrågasatts, men testet har utöver detta även kritiserats för bristande psykometriska egenskaper (Green, Goldman, & Salovey, 1993; Mehrabian, 1997; Tuccitto, Giacobbi, & Leite, 2010). Frågorna har främst gällt testets faktoriella struktur, d.v.s. om testresultaten verkligen bäst karaktäriseras av en tvåfaktorstruktur, eller om alternativa tre- eller mer komplexa flerfaktorstrukturer bättre förklarar variationen i testpoäng.

Även om PANAS generella tvåfaktoriella struktur replikerats i flera olika språkliga miljöer, har vissa specifika PANAS termer visat sig påverkas av språkliga och kulturella aspekter (Joiner et al., 1997). Testet har översatts till flera olika språk, bland annat estniska (Allik & Realo, 1997), svenska (Hillerås et al., 1998), italienska (Terraciano, McCrae, & Costa, 2003), serbiska (Michic, et al., 2014), spanska (Joiner et al., 1997) och franska (Gaudreau et al., 2006), vissa resultat tyder på att alla affekttermer inte är lika goda mått på PA och NA, då de översätts från en språklig miljö till en annan (Joiner et al., 1997; Thompson (2007); Watson et al., 1984).

Syfte

Syftet med denna avhandling var att utveckla en finskspråkig motsvarighet till PANAS, samt att undersöka det nyutvecklade testets psykometriska egenskaper. Med tanke på studier som antytt brister i PANAS faktorstruktur, oklarheter i faktorernas inbördes relationer, samt försämrade psykometriska egenskaper hos vissa affekttermer i tvärkulturella kontexter, var det viktigt att utföra testutvecklingen på ett sätt som tog dessa aspekter i beaktande. Specifikt var det viktigt att faktorstrukturen i det nyutvecklade testet skulle motsvarar teorin testet byggde på, samt att termerna inkluderade i testet verkligen skulle utgöra goda mått på de dimensioner testet avses mäta. En enkel översättning av PANAS från engelska till finska hade inte med säkerhet kunnat uppfylla dessa krav. Förutom att endast utveckla en finskspråkig motsvarighet till PANAS, var det också viktigt att förse det nyutvecklade testet med normer, för att underlätta tolkning av resultat och därmed utöka testets användningsområde.

Metod

Svarspersoner

Totalt 863 personer svarade på nätenkäten. Enkäten distribuerades per epost via diverse universitets epostlistor. Inklusionskriterierna var följande: 1) Svarspersonen måste vara minst 18 år gammal, 2) enspråkigt finskspråkig och 3) psykiatriskt frisk (har inte diagnostiserats med psykiatrisk sjukdom under senaste 12 månader, samt använder för tillfället inga psykiatriska mediciner). Sjutton svarspersoner exkluderades på basen av dessa kriterier. Ytterligare tolv personer exkluderades på basen av bristfälliga svar på demografiska bakgrundsfrågor (frågor gällande kön, ålder, utbildningsnivå o.d.). 17 personer exkluderades på grund av slumpmässiga svar (t.ex. svarat endast 1 eller 5 på majoriteten av presenterade affekttermer). Därmed exkluderades 46 svarspersoner, och 817 svarspersoner inkluderades i de statistiska analyserna.

Instrument

Som tidigare nämnts användes PANAS-X som utgångspunkt i denna avhandling. De 60 affektiva termerna i PANAS-X översattes med så kallad double-back-metod, som i praktiken innebär att två av varandra oberoende personer först översätter testet till finska, varefter ytterligare två andra personer översätter testet tillbaka till engelska. Därefter jämförs den ursprungliga versionen av testet med den versionen som översatts två gånger. De fyra personer som utförde översättningen var alla kvalificerade översättare mellan engelska och finska. Det slutliga beslutet om vilka översättningar som inkluderades, det vill säga i de fall då den översatta termen inte längre motsvarade den ursprungliga termen, gjordes av handledare Söderholm.

Svarspersonerna ombads uppskatta i vilken grad de upplevt var och en av de 60 presenterade affekttermerna, på en skala från 1 (i mycket lite grad) till 5 (i mycket hög grad). Uppskattningarna gjordes först med tidsinstruktionen för affektivt tillstånd (”I vilken grad upplever du följande affekter just nu?”) och därefter med tidsinstruktionen för affektiv egenskap (”I vilken grad upplever du följande affekter i allmänhet”).

Utöver PANAS-X behövdes ytterligare test, för att säkerställa det nyutvecklade testets validitet och reliabilitet. Till detta användes Raitasalos Enkät om sinnesstämningar (RBDI; Raitasalo, 2007), Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), samt ytterligare åtta ostandardiserade frågor som mätte följande egenskaper: stress (nuvarande nivå samt nivån under senaste 12 månader), livskvalitet (nuvarande nivå samt nivån under senaste 12

månader), tillfredsställelse med livet (nuvarande nivå samt nivån under senaste 12 månader), nuvarande hälsotillstånd och slutligen nuvarande humör.

Procedur

Nätenkäten gjordes med programmet E-lomake. Svarspersonerna svarade på frågorna i följande ordning: 1) Relevanta demografiska frågor (ålder, kön, utbildningsnivå med flera) och de åtta frågorna som utgjorde de ostandardiserade validitets- och reliabilitetsmåtten, 2) 60 affekttermer med tidsinstruktionen för affektivt tillstånd, 3) RBDI och RSES, samt 4) 60 affekttermer med tidsinstrutkionen för affektiva egenskaper. Alla deltagare svarade på frågorna i samma ordning. Innan den slutliga versionen av enkäten publicerades, utfördes en småskalig pilotundersökning, för att bedöma till exempel hur lång tid det tar att fylla i enkäten. Därefter skickades länken till enkäten ut till olika e-postlistor, vars webbmasters meddelat sig vara villiga att förmedla länken till sin e-postlista. Epostlistorna var i huvudsak universitets- och skolinstansers. Svarspersonerna var anonyma och kunde när som helst avbryta ifyllandet av enkäten.

Resultat

Faktoranalyser

De slutliga faktorlösningarna för såväl data från tidsinstruktionen för affektiva tillstånd, som affektiva egenskaper, tydde på en tvåfaktorstruktur med svagt negativt korrelerade faktorer. Tvåfaktorstrukturen i data för affektiva tillstånd förklarade 40,3% av variansen i data. Den första faktorn identifierades som NA och den andra som PA. Efter rotation (oblique rotation) förklarade respektive faktor 23,8% och 16,5% av variansen i data. Korrelationen mellan faktorerna var -0,174. I data för affektiva tillstånd förklarade tvåfaktorstrukturen 41,2% av variansen i data. Återigen identifierades den första faktorn som NA och den andra som PA. Respektive faktor förklarade 24,4% och 16,8% av variationen, efter rotation (oblique rotation). Korrelationen mellan faktorerna var -0,208.

Faktoriell validitet

Faktorernas begreppsvaliditet undersöktes med hjälp av regressionsbaserade faktorpoäng. Korrelationsmönstret mellan faktorpoängen och validitetsmåtten, det vill säga RBDI, RSES och de åtta ostandardiserade validitetsmåtten, var i linje med tidigare forskning och bekräftade därmed PA- och NA-faktorernas validitet, samt uppdelningen i mått av affektiva tillstånd och mått av affektiva egenskaper.

Val av affekttermer till Finnish Measure of Posivit and Negative Affect

I och med att tvåfaktorstrukturen fastställts, fick den finska motsvarigheten till PANAS namnet Finnish Measure of Positive and Negative Affect (FiPANA). Valet av vilka 20 termer som skulle utgöra de slutliga affektiva termerna i FiPANA var fullständigt datadrivet. För att identifiera de termer som laddade högst i både i tillstånds- och egenskapsdata, d.v.s. i data som mätte affektiva tillstånd och i data som mätte affektiva egenskaper, beräknades medeltal för termernas faktorladdningar. De slutliga FiPANA termerna, samt deras PANAS-X motsvarighet, hittas i tabell 1. Faktoranalyser av dessa 20 FiPANA termer, validerade testets tvåfaktorstruktur. Korrelationen mellan faktorerna var -0,281 i tillståndsdata och -0,263 i egenskapsdata. Ytterligare undersökningar av FiPANA PA- och NA-skalorna, tydde på onormal fördelning i skalpoäng: Medan PA-skalpoäng var normalt fördelade i såväl tillstånds- som egenskapsdata, var NA-skalpoängen klart snett fördelade.

Undersökning av testets validitet och reliabilitet

FiPANA uppvisade samma korrelationsmönster till validitetsmåtten, som tidigare identifierats vid undersökning av faktoriell validitet. Därmed bekräftades validiteten av PA och NA skalorna, samt användningen av testet med tidsinstruktionen för såväl affektiva tillstånd, som affektiva egenskaper. Reliabiliteten undersöktes med hjälp av Cronbach´s alfa, och alla värden låg kring 0,9, vilket tyder på att både PA och NA skalorna, använda med såväl tillstånds- som egenskapsinstruktioner, har hög intern reliabilitet.

FiPANA normer

Eftersom inga statistiskt signifikanta samband hittades mellan ålder och FiPANA PA- eller NA-skalpoäng, varken i tillstånds- eller egenskapsdata, utformades inga särskilda åldersnormer. I och med de identifierade könsskillnader i FiPANA skalpoäng, krävdes dock separata normer för män och kvinnor.

Tabell 1

De 20 slutliga FiPANA termerna, samt deras motsvarigheter i PANAS-X

FiPANA term	PANAS-X motsvarighet	PANAS-X skala
PA-termer:		
eläväinen	lively	Joviality
energinen	energetic	Joviality
ilahtunut	delighted	Joviality
iloinen	joyful	Joviality
innostunut	enthusiastic	Joviality, PA
kiinnostunut	interested	PA
päättäväinen	determined	Attentiveness, PA
rohkea	bold	Self-Assurance
toimelias	active	PA
valpas	alert	Attentiveness, PA
NA-termer:		
ahdistunut	distressed	NA
lannistunut	blue	Sadness
peloissaan	scared	Fear, NA
häpeissään	ashamed	Guilt, NA
hermostunut	nervous	Fear, NA
vihainen itselleen	angry at self	Guilt
pelokas	afraid	Fear, NA
epävarma	shaky	Fear
inhon tunne	loathing	Hostility
tyytymätön itseensä	dissatisfied with self	Guilt

Kommentar. PANAS-X = Positive and Negative Affect Schedule – Expanded Form (Watson & Clark, 1994); Termer som hör till PANAS-X PA- and NA-skalorna är termer som användes i ursprungliga PANAS (Watson, Clark, & Tellegen, 1988).

Diskussion

Syftet med denna studie var att utveckla en finskspråkig motsvarighet till PANAS. Eftersom tidigare studier antytt brister i PANAS faktorstruktur, samt identifierat vissa termer som tvärkulturellt problematiska, kunde en direkt översättning av PANAS till finska inte ses som en acceptabel strategi för utveckling av FiPANA. Istället bestod första steget i testutvecklingen av en explorativ faktoranalys av ett större antal termer tagna ur PANAS-X.

Faktoranalyserna i såväl tillstånds- som egenskapsdata resulterade i en tvåfaktoriell lösning, där faktorerna i bägge fallen identifierades som PA och NA. Även om ytterligare bekräftande faktoranalyser krävs för att säkerställa fyndet, antyder dessa resultat att tvåfaktorstrukturen för självrapporterad affekt går att hitta även i ett sampel finskspråkiga, friska vuxna.

På basen av resultaten i faktoranalyserna valdes 10 termer som hade de högsta laddningarna på respektive faktor. På så sätt skapades FiPANA, med 10 termer som mäter PA och 10 termer som mäter NA. Testet visade sig ha god validitet och reliabilitet, och fungerar både som mått på affektivt tillstånd (med tidsinstruktionen ”I vilken grad upplever du följande affekter just nu?”), och som mått på affektiv egenskap (med instruktionen ”I vilken grad upplever du följande affekter i allmänhet”).

Jämförelser mellan FiPANA och den ursprungliga versionen av PANAS visade att testen delade hälften av termerna i såväl PA- som NA-skalan. Därmed var FiPANA endast marginellt bättre på att mäta PA och NA faktorer. Vidare undersökningar av de översatta PANAS termerna antydde dock flera andra psykometriska brister i en direkt översättning av PANAS: Flera av de översatta termerna var mycket lika varandra och resulterade därmed i multikollinearitet. Detta kan återspegla möjliga skillnader i det finska och engelska språket, där engelskan möjligen har flera nyanser för vissa affekttermer, men det är också möjligt att fyndet återspeglar brister i PANAS, eftersom testet upprepade gånger kritiserats för överflödigt innehåll (Crawford & Henry, 2004; Gaudreau et al., 2006; Thompson, 2007).

Ett annat intressant fynd var könsskillnaderna i PA- och NA-skalorna. Även om resultaten i stort sett var i linje med tidigare forskning (Crawford & Henry, 2004; Engelen et al., 2006; Terracciano et al., 2003), visade undersökningar av motsvarande översatta PANAS skalorna inte motsvarande mönster. Mer specifika undersökningar visade att olika affekttermer uppvisade olika grad av könsskillnader. Fyndet är intressant, eftersom det antyder att små ändringar i skalkomposition kan antingen bidra till att könsskillnader framhävs eller inte. Eftersom könsskillnader identifierades för FiPANA, producerades separata könsspecifika normer, för att underlätta tolkning av PA- och NA-skalpoäng.

Begränsningar

I och med att alla svarspersoner svarade på enkäten i samma ordning, var det inte möjligt att kontrollera för ordningseffekter. Användningen av bekvämlighetssampling kan också ha påverkat resultatet, och framtida studier bör ämna undersöka huruvida nuvarande resultat replikeras i ett för den finskspråkiga populationen mer representativt sampel. Användningen av mer etablerade validitetsmått rekommenderas också. Slutligen bör ännu nämnas att de faktoranalytiska resultaten behöver bekräftas i framtida faktoranalyser, innan tvåfaktor-strukturen med säkerhet kan generaliseras till den finskspråkiga populationen.

Slutsatser

Det nyutvecklade testet av positiv och negativ affektivitet, FiPANA, visade sig ha god validitet och reliabilitet, såväl vid mätning av temporära affektiva tillstånd, som mätning av mer bestående individuella affektiva egenskaper. Testet publiceras med såväl generella som könsspecifika normer, på grund av de identifierade könsskillnaderna i skalpoäng. Framtida studier bör ämna bekräfta faktoranalysernas resultat och vidare undersöka de psykometriska egenskaperna i FiPANA. Studier bör också fokusera på att undersöka finskspråkiga subpopulationer, och specifikt till exempel jämföra kliniska och icke-kliniska populationer, för att i framtiden bredda på möjliga användningsområden för FiPANA.

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Appendix

Appendix A

PANAS-X items in English, the corresponding Finnish translations, and the content of the PANAS-X scales

PANAS-X Item	Translation	PANAS-X Scale	
afraid*	pelokas	Fear, NA	
jittery*	jännittynyt	Fear, NA	
nervous*	hermostunut	Fear, NA	
scared*	peloissaan	Fear, NA	
frightened	pelästynyt	Fear	
shaky	epävarma	Fear	
hostile*	vihamielinen	Hostility, NA	
irritable*	ärsyyntynyt	Hostility, NA	
angry	vihainen	Hostility	
disgusted	vastenmielisyyden tunne	Hostility	
loathing	inhon tunne	Hostility	
scornful	ylimielinen	Hostility	Basic Negative Emotion Scales
ashamed*	häpeissään	Guilt, NA	
guilty*	syyllinen	Guilt, NA	
angry at self	vihainen itselleen	Guilt	
blameworthy	moitittava	Guilt	
disgusted with self	itseinhon tunne	Guilt	
dissatisfied with self	tyytymätön itseensä	Guilt	
alone	yksin	Sadness	
blue	lannistunut	Sadness	
downhearted	alakuloinen	Sadness	
lonely	yksinäinen	Sadness	
sad	surullinen	Sadness	
upset*	poissa tolaltaan	NA	
distressed*	ahdistunut	NA	
cheerful	hilpeä	Joviality	
delighted	ilahtunut	Joviality	
energetic	energinen	Joviality	
enthusiastic*	innostunut	Joviality, PA	
excited*	innokas	Joviality, PA	
happy	onnellinen	Joviality	
joyful	iloinen	Joviality	
lively	eläväinen	Joviality	
bold	rohkea	Self-Assurance	Basic Positive Emotion Scales
confident	itsevarma	Self-Assurance	
daring	uskalias	Self-Assurance	
fearless	peloton	Self-Assurance	
proud*	ylpeä	Self-Assurance, PA	
strong*	vahva	Self-Assurance, PA	
alert*	valpas	Attentiveness, PA	
attentive*	tarkkaavainen	Attentiveness, PA	
concentrating	keskittynyt	Attentiveness	
determined*	päättäväinen	Attentiveness, PA	
active*	toimelias	PA	
inspired*	haltioitunut	PA	
interested*	kiinnostunut	PA	

Appendix A (continued).

sheepish	hämillään	Shyness	
shy	ujo	Shyness	
timid	arka	Shyness	
drowsy	unelias	Fatigue	
sleepy	uninen	Fatigue	
sluggish	hidas	Fatigue	
tired	väsynyt	Fatigue	Other Affective Scales
at ease	levollinen	Serenity	
calm	rauhallinen	Serenity	
relaxed	rentoutunut	Serenity	
bashful	kaino	Shyness	
amazed	hämmästynyt	Surprise	
astonished	ällistynyt	Surprise	
surprised	yllättynyt	Surprise	

* items included in the original 20-item PANAS (Watson, Clark, & Tellegen, 1988)

Appendix B

Questionnaire.

Tervetuloa kyselyyn!

Kysely koostuu taustatietokysymyksistä, tutkittavasta mittarista (kahdesti eri ohjeilla) ja kahdesta muusta lyhyestä tunnekokemusmittarista. Kyselyyn vastaaminen kestää noin 10-15 min. Täytettyänne kyselylomakkeen Teillä on halutessanne mahdollisuus osallistua erilliseen arvontaan, jossa voitte voittaa joko 85 euron arvoisen lahjakortin Giganttiin tai Stockmannille tai 10 elokuvalippua Finnkinoon. Jos voitto osuu kohdallenne, voitte valita edellä mainittujen vaihtoehtojen väliltä.

Kyselyyn vastataan nimettömänä ja tietoja käsitellään luottamuksellisesti. Voitte keskeyttää vastaamisen milloin tahansa.

Osallistuminen edellyttää, että olette äidinkieleltänne suomenkielinen ja että olette varttunut täysin suomenkielisessä kodissa. Lisäksi edellytetään, että ette käytä säännöllistä psyykenlääkitystä ja että Teillä ei ole todettu psykiatrista diagnoosia viimeisen 12 kk aikana.

Vastauksia lähetetään painamalla "Tallenna"-painiketta lomakkeen lopussa. Mikäli ette ole vastannut johonkin kysymykseen, ohjelma ilmoittaa mihin kohtaan pitää vielä vastata. Painakaa tämän jälkeen "Tallenna"-painiketta uudestaan.

A. **TAUSTATIEDOT**

1. **Sukupuoli** Nainen / Mies
2. **Ikä**
3. **Äidinkieli** Suomi / Ruotsi / Muu
4. **Koulutus** (voi rastittaa useampia vaihtoehtoja)
   Perus-, kansa-, kansalaiskoulu / Lukio, oppikoulu / Ylioppilas / Opisto, ammattikoulu / Ammattikorkeakoulu /Alempi korkeakoulututkinto / Ylempi korkeakoulututkinto (maisteri) /
   Tieteellinen jatkotutkinto (lisensiaatti, tohtori)
5. **Kuinka monta vuotta yhteensä olette käynyt kouluja?** ___
6. **Nykyinen ammattinimike** (tai viimeinen ammattinimike ennen eläkkeelle jäämistä): ___
7. **Tulot vuodessa** (euroissa)
   0 - 4999 / 5000 – 9999 / 10 000 - 14 999 / 15 000 - 19 999 / 20 000 - 24 999 / 25 000 - 29 999 /
   30 000 - 39 999 / 40 000 - 49 999 / 50 000 - 79 999 / 80 000 -
8. **Siviilisääty** (voi rastittaa useampia vaihtoehtoja)
   Naimaton / Naimaton, parisuhteessa / Avoliitossa / Avioliitossa / Rekisteröidyssä parisuhteessa / Eronnut / Leski
9. **Onko teillä lapsia?** Kyllä / Ei Jos on, kuinka monta?
10. **Arvioikaa** (1 = erittäin huono; 3 = ei huono eikä hyvä; 5 = erittäin hyvä)
    a. nykyinen terveydentila*
    b. nykyinen mieliala*
    c. nykyinen elämänlaatu*

d. elämänlaatu viimeisen 12 kk aikana*

11. **Onko teillä todettu jokin sairaus, johon käytätte säännöllistä lääkitystä?**

    Kyllä / Ei Jos on, mikä/mitkä? (vapaaehtoinen)

12. **Onko teillä aikaisemmin elämänne aikana (yli 12 kuukautta sitten) todettu jokin psykiatrinen diagnoosi?**

    Kyllä / Ei Jos on, mikä/mitkä? (vapaaehtoinen)

13. **Arvioikaa** (1=erittäin tyytymätön; 3 = ei tyytymätön eikä tyytyväinen; 5=erittäin tyytyväinen)
    a. **…kuinka tyytyväinen olette elämäänne juuri nyt?***
    b. **…kuinka tyytyväinen olette ollut elämäänne viimeisen 12 kk aikana?***

Arvioikaa (1= erittäin passiivinen; 3 = ei passiivinen eikä aktiivinen; 5= erittäin aktiivinen)

14. **… kuinka sosiaalisesti aktiivinen olette?***

15. **Kuinka monta tuntia viikossa harrastatte keskimäärin (mitä tahansa) liikuntaa?**
    ___

16. **Onko teillä säännöllisiä harrastuksia, tai teettekö säännöllisesti asioita, joista saatte mielihyvää?**

    Kyllä / Ei

17. **Kuinka monta tuntia viikossa keskimäärin harrastatte tai teette asioita joista saatte mielihyvää? ___**

18. **Stressillä tarkoitetaan kiihtymistilaa, joka alkaa usein psyykkisenä ja johtaa myös elimistön kiihtymiseen. Mikä tahansa asia voi laukaista stressin, kuten suuret elämänmuutokset, myös myönteiset sellaiset.**
    (1 = ei lainkaan; 5 = hyvin paljon)
    a. **Kuinka paljon stressiä koette juuri nyt?***
    b. **Kuinka paljon stressiä olette kokenut viimeisen 12 kk aikana?***

B. **Onko elämässänne tapahtunut muutoksia viimeisen 12 kk aikana** (esim. muutto uuteen kotiin, avioliitto, lapsen saanti, muutoksia työelämässä , sairastuminen, lähiomaisen kuolema)**? Jos on, kuvailkaa lyhyesti mitä on tapahtunut?**
___TUNNEKOKEMUSMITTARI 1

Alla näette sanoja, jotka kuvaavat erilaisia tunteita tai tunnekokemuksia. Lukekaa jokainen sana ja merkitkää sopiva vastaus sanan vieressä olevaan ympyrään. Ilmoittakaa missä määrin tunnette tällä tavoin TÄLLÄ HETKELLÄ.

(1= erittäin vähän tai en ollenkaan; 2 = vähän; 3 = kohtuullisesti ; 4 = melko paljon; 5 = erittäin paljon)

[hilpeä, vastenmielisyyden tunne, tarkkaavainen, kaino, hidas, uskalias, yllättynyt, vahva, ylimielinen, rentoutunut, ärsyyntynyt, ilahtunut, haltioitunut, peloton, itseinhon tunnem, surullinen, rauhallinen, pelokas, väsynyt, hämmästynyt, epävarma, onnellinen, arka, yksin, valpas, poissa tolaltaan, vihainen, rohkea, alakuloinen, ujo, toimelias, syyllinen, iloinen, hermostunut, yksinäinen, uninen, innokas, vihamielinen, ylpeä, jännittynyt, eläväinen, häpeissään, levollinen, peloissaan, unelias, vihainen itselleen, innostunut, lannistunut, hämillään, ahdistunut, moitittava, päättäväinen, pelästynyt, ällistynyt, kinnostunut, inhon tunne, itsevarma, energinen, keskittynyt, tyytymätön itseensä]

C. **MIELIALAKYSELY** (RBDI; Raitasalo, 2007)

D. **ITSETUNTO-KYSELY** (Rosenberg, 1965; suom. Raitasalo, 2007)

E. **TUNNEKOKEMUSMITTARI 2**

Alla näette sanoja, jotka kuvaavat erilaisia tunteita tai tunnekokemuksia. Lukekaa jokainen sana ja merkitkää sopiva vastaus sanan vieressä olevaan ympyrään. Ilmoittakaa, missä määrin tunnette YLEENSÄ tällä tavoin.

Appendix C

Comparison of Item means of FiPANA items and Translated Items Included in the Original PANAS.

				State		Trait	
		PANAS-X equivalent	PANAS-X scale	Men M (SD)	Women M (SD)	Men M (SD)	Women M (SD)
NA-items	**Unique FiPANA items**						
	Lannistunut	blue	Sadness	1.65 (.91)	1.81 (1.06)	1.73 (.92)	1.89 (.95)
	Vihainen itselleen	angry at self	Guilt	1.62 (.93)	1.81 (1.09)	1.67 (.87)	1.87 (.99)
	Epävarma	shaky	Fear	2.22 (1.04)	2.57 (1.14)	2.33 (.97)	2.70 (1.02)
	Inhon tunne	loathing	Hostility	1.37 (.74)	1.43 (.83)	1.44 (.72)	1.59 (.85)
	Tyytymätön itseensä	dissatisfied with self	Guilt	1.99 (1.08)	2.10 (1.19)	1.76 (1.03)	2.12 (1.09)
	Unique PANAS items						
	Jännittynyt	Jittery	Fear, NA	2.01 (.98)	2.17 (1.07)	2.20 (.91)	2.49 (.93)
	Vihamielinen	Hostile	Hostility, NA	1.31 (.68)	1.31 (.69)	1.40 (.62)	1.49 (.75)
	Ärsyyntynyt	Irritable	Hostility, NA	2.06 (1.09)	2.16 (1.12)	2.23 (.95)	2.68 (.97)
	Syyllinen	Guilty	Guilt, NA	1.64 (.94)	1.79 (1.08)	1.59 (.80)	1.75 (.96)
	Poissa tolaltaan	Upset	NA	1.35 (.70)	1.41 (.79)	1.34 (.57)	1.56 (.79)
	Items included in both						
	Pelokas	Afraid	Fear, NA	1.45 (.71)	1.72 (.95)	1.52 (.71)	1.91 (.90)
	Hermostunut	Nervous	Fear, NA	1.84 (.91)	2.02 (1.08)	2.05 (.88)	2.40 (.97)
	Peloissaan	Scared	Fear, NA	1.31 (.70)	1.49 (.85)	1.41 (.62)	1.68 (.83)
	Häpeissään	Ashamed	Guilt, NA	1.49 (.82)	1.51 (.84)	1.50 (.74)	1.74 (.88)
	Ahdistunut	Distressed	NA	1.81 (1.00)	2.11 (1.17)	1.84 (.95)	2.30 (1.06)

Appendix C (continued).Appendix C (continued).

PA-items	**Unique FiPANA items**						
	Eläväinen	lively	Joviality	2.64 (.97)	2.62 (1.14)	3.07 (1.07)	3.39 (1.06)
	Energinen	energetic	Joviality	2.60 (.90)	2.50 (1.00)	3.16 (.91)	3.28 (.94)
	Ilahtunut	delighted	Joviality	2.65 (1.06)	2.62 (1.11)	3.24 (.96)	3.41 (.90)
	Iloinen	joyful	Joviality	3.08 (.94)	3.00 (1.08)	3.51 (.95)	3.78 (.87)
	Rohkea	bold	Self-Assurance	2.88 (1.00)	2.74 (1.03)	3.10 (.96)	3.09 (.95)
	Unique PANAS items						
	Innokas	Excited	Joviality, PA	2.63 (.93)	2.62 (1.02)	3.20 (.92)	3.47 (.90)
	Ylpeä	Proud	Self-Assurance, PA	2.42 (1.03)	2.26 (1.10)	2.69 (1.00)	2.50 (1.02)
	Vahva	Strong	Self-Assurance, PA	3.22 (.90)	3.14 (.98)	3.49 (.91)	3.42 (.94)
	Tarkkaavainen	Attentive	Attentiveness, PA	3.38 (.95)	3.11 (.94)	3.71 (.88)	3.62 (.83)
	Haltioitunut	Inspired	PA	1.76 (1.04)	1.61 (.96)	2.30 (1.08)	2.37 (1.04)
	Items included in both						
	Innostunut	Enthusiastic	Joviality, PA	2.66 (.99)	2.62 (1.08)	3.25 (.97)	3.55 (.90)
	Valpas	Alert	Attentiveness, PA	2.91 (.88)	2.60 (.97)	3.34 (.83)	3.18 (.88)
	Päättäväinen	Determined	Attentiveness, PA	3.12 (.94)	3.03 (1.05)	3.35 (.95)	3.45 (.96)
	Toimelias	Active	PA	2.76 (1.05)	2.84 (1.05)	3.24 (.95)	3.48 (.94)
	Kiinnostunut	Interested	PA	3.12 (.98)	3.09 (1.03)	3.69 (.89)	3.79 (.84)

Note. FiPANA = Finnish Measure of Positive and Negative Affect; PANAS = Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988).