Research Article

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A Serbian version of the ANPS and its link to the five-factor model of personality

<https://doi.org/10.1515/psych-2018-0019>

Received June 4, 2018; accepted June 24, 2019

Abstract: This short communication presents a Serbian version of the Affective Neuroscience Personality Scales (ANPS). The ANPS is a self-report measure assessing individual differences in primary emotional systems as derived from Jaak Panksepp's Affective Neuroscience Theory. As a recent work by Montag & Panksepp (2017a) confirmed the original demonstration of strong associations between primary emotions and the Five-Factor Model of Personality (Davis et al., 2003) across different cultures (USA, Germany, China), we replicated these findings in a Serbian sample. Moreover, following the idea of a recent commentary of Di Domenico & Ryan (2017) on Montag & Panksepp's (2017a), we present for the first time detailed associations between Five-Factor Model facets as assessed with the NEO-PI-R and primary emotions.

Keywords: Affective Neuroscience Theory; Serbian Affective Neuroscience Personality Scales (ANPS); Neuroticism Extraversion Openness Personality Inventory-Revised (NEO-PI-R)

1 Introduction

The Affective Neuroscience Theory (ANT) by Jaak Panksepp represents one of the most important emotion theories to understand affective lives of mammalian beings (Davis & Montag, 2018; Panksepp, 1998; Panksepp, 2011). By electrical stimulation of the mammalian brain, but also pharmacological challenge tests, Panksepp carved out seven primary emotional systems deeply rooted in subcortical areas of the mammalian brain (Panksepp, 2007). These systems have been coined SEEKING, CARE, LUST, and PLAY on the positive side of emotions and FEAR, RAGE, SADNESS on the negative side of emotions (for an overview see also Montag & Davis, 2018)¹. A better understanding of primary emotional systems on both molecular level, structural/functional brain level as well as on a psychological level has been shown to be of tremendous importance to also better understand affective disorders (e.g., Montag et al., 2017; Panksepp, 2010; Panksepp & Yovell, 2014).

Mounting evidence demonstrates the usefulness of ANT to also better understand individual differences in personality (e.g., Davis et al., 2003; Davis & Panksepp, 2011; Hiebler-Ragger et al., 2018; Montag & Davis,

¹ Please note that primary emotional systems are written in large letters to not confound them with same sounding terms in the psychological literature.

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2018). In a recent publication by Montag & Panksepp (2017a) it has been demonstrated with data from cross-cultural research that not only primary emotional systems as described above are robustly linked with the prominent Five Factors of Personality, but also that primary emotional systems could represent the phylogenetically oldest parts of human personality (for a detailed discussion see by Montag & Panksepp, 2017a and the follow-up work by Montag & Panksepp, 2017b). Together with an older work by Davis and his colleagues (2003), evidence from the USA, Germany and China point towards the idea that (high) SEEKING could reflect the emotional foundation of Openness to Experience, (high) PLAY for Extraversion, low ANGER/high CARE for Agreeableness and (high) FEAR, SADNESS and ANGER for Neuroticism (see also Barrett et al., 2013; Montag & Davis, 2018). In all these works individual differences in primary emotional systems have been assessed with the Affective Neuroscience Personality Scales (ANPS), a well-known tertiary measure of a person's endophenotype based on Panksepp's ANT (Davis & Panksepp, 2011). A commentary by Di Domenico & Ryan (2017) on the work by Montag & Panksepp (2017a) correctly pointed out the necessity to also understand how individual differences in primary emotion systems relate to facets of the Five Factor Model (FFM). Therefore, in the present work, we provide associations between individual differences in primary emotional systems as assessed with the ANPS 2.4 and the FFM as assessed with the NEO-PI-R. As the present study has been conducted in Serbia, we are able to investigate if a) the mentioned robust associations between primary emotional systems and the FFM can be extended to a Serbian sample and b) how individual differences in primary emotional systems are linked to individual differences in NEO-PI-R facets. Finally, and c), we present the Serbian version of the ANPS in this paper. The growing need to have a Serbian translation of the ANPS is also reflected in the many already existent translations and validations of the ANPS and its use around the globe. The scale is already available in the following languages other than English (alphabetical order): Chinese (Sindermann et al., 2018), French (Pahlavan et al., 2008), German (Reuter et al., 2017), Italian (Pascasio et al., 2015), Norwegian (Pedersen et al., 2014), Spanish (Abella et al., 2011) and Turkish (Özkarar-Gradwohl et al., 2014). We also know of several additional translations that have not been published including a Japanese version to be published soon (for a recent perspective on cross-cultural affective neuroscience see Özkarar-Gradwohl, 2019).

2 Methods

2.1 Declarations

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study. The present work has been approved by the ethics committee of the Serbian Psychological Association at the Faculty of Philosophy, University of Belgrade. All participants signed an informed consent and all procedures adhered to the principles of the Declaration of Helsinki.

2.2 Participants

A sample of 340 participants (57 males and 283 females, age = 20.94, $SD = 2.76$; age-range: 19-46) filled in ANPS 2.4 and NEO-PI-R. Please note that as part of a cross-cultural project, also HEXACO data were collected, which have been published in Knežević et al. (2019), recently. We did not aim at presenting ANPS, HEXACO and NEO-PI-R data in one work, because Knežević et al. (2019) investigated HEXACO and ANPS in a German and Serbian sample as a separate project, whereas in Germany no NEO-PI-R data was collected. All participants had a university/student background. Participants stated to be healthy upon participation. Students volunteered to participate in the study and signed informed consent forms before completing the instruments. Students received feedback regarding their assessment results, but no extra course credit was provided. Instruments were administered via an online Moodle platform, not allowing participants to skip the answers. There were no missing data, and we did not apply any additional manipulations to the

data. The participants filled-in personality inventories during regular lessons. All data, materials, syntax of questionnaires, and other supplementary information are available at <https://osf.io/gp2z8/>. The sample size was calculated having in mind the goal to detect correlations which size is at least 0.15, with the power of 0.80 at $p = 0.05$ level (the calculation was done by using G*Power free software).

2.3 Questionnaires

The ANPS 2.4 by Davis & Panksepp (2011) consists of 112 items and has been translated from English into the Serbian language (and back-translated) by bilingual psychologists. The complete Serbian ANPS questionnaire is provided in Appendix 1 and is available at <https://osf.io/gp2z8/>. With each ANPS scale having 14 items and a Likert scale ranging from *strongly disagree* (0) to *strongly agree* (3) individual differences in SEEKING, CARE, PLAY (positive affects) and FEAR, ANGER, SADNESS (negative affects) can be assessed. The seventh primary emotion of LUST is not assessed in the ANPS questionnaire, because of possible negative carry-over-effects on answers with respect to all other items of the ANPS. Twelve additional items assess individual differences in spirituality. Spirituality represents not a primary emotion but is of potential interest in the treatment of patients suffering from addictive disorders. Spirituality will be not further investigated in the present work.

The NEO-PI-R consists of 240 items with a five Likert scale ranging from strongly disagree (0) to strongly agree (4). The NEO-PI-R assesses the FFM and uses the following factor labels: Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. Moreover, it segments each factor into six facets for a total of 30 facet scores. These facets are presented in the results section. The Serbian version of the NEO-PI-R was used in this study (Đuričić-Jočić, Džamonja Ignjatović, & Knežević, 2004).

2.4 Statistical Analysis

Several correlational analyses using Pearson's coefficient were computed searching for associations between the dimensions of the ANPS and the NEO-PI-R. The influence of gender on the personality dimensions will not be investigated, because the recruited sample largely consists of females. Correlations with age and the dimensions will not be further considered in the results section, because no significant associations with age and the NEO-PI-R or ANPS were observed (after correction for multiple testing). All correlation probabilities in the paper are two-tailed. Finally, a factor analysis (Principal Axis Factoring) yielded two factors out of the ANPS dimensions, namely positive and negative affect.

3 Results

3.1 Descriptive statistics of the present sample

Descriptive statistics are presented in Table 1. The skewness values presented in this table suggest that some variables might slightly deviate from a normal distribution: Openness, Extraversion, Agreeableness, CARE and SEEKING have the largest negative asymmetry (grouping of the scores around the higher values), while ANGER and SADNESS have the largest positive asymmetry (grouping around the lower values). Nevertheless, visual inspection of the variables shows a rather normal distribution of variables supporting the validness of parametric testing.

Internal consistencies of ANPS scales obtained in this study are very good, and in case of NEO PI-R domain scales, excellent (again see Table 1). Cronbach's alphas for Serbian NEO PI-R facets range from .67 (Activity and Excitement Seeking) to .89 (Anxiety), except for (Openness to) Values and Tender-Mindedness, which had reliability coefficients below .60. The median Cronbach's alpha of the Serbian NEO facets is .77.

Table 1. Descriptive statistics and reliabilities of ANPS and NEO PI-R domain scales

	M	SD	Skew	Kurt	Alpha	K-S test/p
SEEKING	28.89	5.82	-0.36	-0.19	.79	0.066/0.001
FEAR	24.05	8.98	-0.11	-0.64	.91	0.048/0.054
CARE	28.89	6.20	-0.40	-0.17	.77	0.073/<0.001
ANGER	19.50	7.60	0.25	-0.20	.86	0.055/0.016
PLAY	25.79	6.77	-0.29	-0.19	.82	0.077/<0.001
SADNESS	24.97	6.59	0.20	-0.21	.80	0.084/<0.001
Neuroticism	93.34	29.62	0.14	-0.56	.94	0.048/0.057
Extraversion	106.59	25.69	-0.38	-0.14	.92	0.048/0.060
Openness	132.14	20.07	-0.45	0.59	.88	0.058/0.007
Agreeableness	124.01	21.60	-0.36	0.29	.91	0.038/0.200
Conscientiousness	126.76	25.49	-0.22	-0.25	.94	0.049/0.049

Note. Mean (M), Standard Deviation (SD), Skewness (Skew), Kurtosis (Kurt), Cronbach's alpha (Alpha), Kolmogorov-Smirnov normality test (K-S) and its significance (p)

3.2 Associations between ANPS 2.4 and the NEO-PI-R

To replicate earlier associations (see Montag & Panksepp, 2017a) between the dimensions of the ANPS and the NEO-PI-R, we first computed correlations between dimensions from both inventories. The same robust associations as observed earlier appeared with moderate to strong associations between (high) FEAR, SADNESS, ANGER and (high) Neuroticism; (high) PLAY and (high) Extraversion; (high) SEEKING and (high) Openness to Experience; (high) CARE / (low) ANGER and (high) Agreeableness. The predicted strong correlations reported in Davis et al. (2003) using a completely different “Big Five”/FFM assessment are presented in boldface in Table 2. The main discrepancy in Table 2 compared to Davis et al. (2003) – using a very different adjective-based Big Five assessment - is the correlation between SEEKING and Extraversion at .49 in Table 2 but low (.13) in Davis et al. (2003), which may have mostly to do with the low correlation between Openness and Extraversion (.18) in Davis et al. (2003). We obtained a correlation of .26 between these two scales (Openness and Extraversion), which is slightly higher. Note that in the Chinese (.35) and German (.36) samples using the NEO-FFI the correlations between SEEKING and Extraversion are also much higher than in the original work by Davis et al. (2003). For further discussion see Montag & Panksepp (2017b).

Table 2. Associations between the Five Factor Model of Personality (assessed with the NEO-PI-R) and the ANPS.

	SEEKING	FEAR	CARE	ANGER	PLAY	SADNESS
Neuroticism	-.28	.83	-.01†	.43	-.30	.70
Extraversion	.49	-.41	.29	.01†	.72	-.22
Openness	.58	-.02†	.28	-.05†	.28	.03†
Agreeableness	.06†	-.00†	.41	-.57	.04†	.04†
Conscientiousness	.25	-.22	.06†	-.21	-.01†	-.20

Note: correlations above .45 have been indicated by bold letters (an exception is the correlation between Agreeableness and CARE with a slightly lower value). The correlation between Extraversion and FEAR is not printed in bold letters, because this association was much lower (-.19) in the original work by Davis et al. (2003). All correlations significant at $p < .001$ except those marked with † $p > .05$.

3.3 The associations between ANPS and the NEO-PI-R facets by personality dimension

When it comes to the Neuroticism facets, FEAR and SADNESS were both most strongly linked to Anxiety (N1), which likely further reflects the close association between the ANPS FEAR and SADNESS scales as shown in Table 7. Not surprisingly, ANGER was most strongly linked to Angry Hostility (N2), which likely is a reflection that six of the N2 items deal closely with anger and frustration with the remaining two items dealing with disgust and resentment. Correlations between FEAR, SADNESS, and ANGER with Neuroticism facets are displayed in Table 3.

Table 3. Correlation patterns between ANPS FEAR, SADNESS, and ANGER and facets of Neuroticism

	FEAR	SADNESS	ANGER
Anxiety (N1)	.88	.65	.29
Angry Hostility (N2)	.58	.49	.69
Depression (N3)	.69	.60	.24
Self-Consciousness (N4)	.68	.55	.21
Impulsiveness (N5)	.42	.42	.41
Vulnerability (N6)	.70	.63	.28

Note: All correlations significant at $p < .001$.

The two highest associations between PLAY and facets of Extraversion can be observed with Excitement-seeking (E5) and Gregariousness (E2), while two highest associations between SEEKING and facets of Openness to Experience can be observed with Ideas (O5) and Actions (O4; see Table 4 for all associations).

Table 4. Correlation patterns between ANPS PLAY and facets of Extraversion, and between ANPS SEEKING and facets of Openness to Experience

PLAY		SEEKING	
Facets of Extraversion		Facets of Openness to Experience	
Warmth (E1)	.48	Fantasy (O1)	.26
Gregariousness (E2)	.60	Aesthetics (O2)	.31
Assertiveness (E3)	.42	Feelings (O3)	.34
Activity (E4)	.50	Actions (O4)	.47
Excitement-Seeking (E5)	.62	Ideas (O5)	.59
Positive Emotions (E6)	.55	Values (O6)	.14

Note: All correlations significant at $p < .001$.

As already mentioned with respect to Agreeableness both high CARE and low ANGER were demonstrated to be of relevance. On Agreeableness facet level the strongest association could be observed between CARE and Tender-Mindedness (A6). Interestingly, this facet had several items similar to ANPS CARE items such as dealing with helping the poor and elderly, sympathy for panhandlers, human needs, and sympathy for the less fortunate. The other strong correlation for the ANPS CARE scale was with Altruism (A3), which again had items similar to those on the CARE scale such as helping others, being charitable, and being known for generosity (see Table 5 for all facet associations). With respect to ANGER, the Agreeableness facets of Compliance (A4) was most robustly associated (here inverse); which is not surprising given the number of items dealing with anger such as being sarcastic and cutting, expressing anger, fighting back, and getting into arguments (see Table 5 for all associations). The full correlation matrix is available in Online Supplementary Materials (<https://osf.io/6rjhm/>).

Table 5. Correlation patterns between ANPS CARE and ANGER and facets of Agreeableness

	CARE	ANGER
Trust (A1)	.29**	-.46**
Straightforwardness (A2)	.23**	-.36**
Altruism (A3)	.46**	-.37**
Compliance (A4)	.19**	-.65**
Modesty (A5)	.14*	-.21**
Tender-Mindedness (A6)	.48**	-.27**

Note: All correlations significant at $p < .001$ (an exception is the Modesty-CARE association being significant on $*p = .01$ level).

3.4 Results of the Principal Axis Factoring (PAF) using Promax rotation (ANPS 2.4 data)

The Factor Analysis (Principal Axis Factoring) yielded two factors, namely the factor positive affect and the factor negative affect. These factors were visible using a Kaiser-Gutman-criterion with factor *negative affect* explaining 35.69% of the variance (the first eigenvalue 2.14) and factor *positive affect* explaining 26.97% of the variance (the second eigenvalue 1.62). The rotated factor matrix is depicted in Table 6. Correlation between the factors was -.20.

For reasons of comparability with older works by Davis et al. (2003) and Davis & Panksepp (2011), we also report intercorrelations between primary emotions as depicted in Table 7.

Table 6. Pattern matrix of Promax rotated factors based on ANPS scales

	Negative affect	Positive affect
SEEKING	-.10	.58
FEAR	.78	-.13
CARE	.27	.50
ANGER	.35	.04
PLAY	-.07	.78
SADNESS	.92	.09

Table 7. Intercorrelations between primary emotional systems

	SEEKING	FEAR	CARE	ANGER	PLAY	SADNESS
SEEKING		-.20**	.25**	-.04	.48**	-.18*
FEAR			.06	.36**	-.30**	.69**
CARE				-.06	.32**	.28**
ANGER					.05	.30**
PLAY						-.15*

Note: ** $p < .001$ level; * $p < .01$ level

4 Discussion

The present short communication followed several aims. First, we aimed to extend the robustly observed associations between the Five Factor Model of Personality and primary emotional systems (Montag & Panksepp, 2017a) as assessed with the ANPS (Davis & Panksepp, 2011) to a new sample from a somewhat different cultural background – namely Serbia. Same robust associations as in Davis et al. (2003) could be observed providing further evidence for globally valid associations between primary emotional systems and

the FFM. As discussed in detail in Montag & Panksepp (2017a, b) also the present data yield evidence for the idea that SEEKING could be the primary emotion driving Openness to Experience in a bottom-up fashion. The same is true for PLAY and Extraversion, high CARE/low ANGER for Agreeableness and finally FEAR, SADNESS, ANGER for Neuroticism. In a commentary by Di Domenico & Ryan (2017) on Montag & Panksepp's (2017a) paper, they set up a further hypothesis with respect to associations between primary emotions and facets of the Five Factor Model, which we tested in the present work. Di Domenico & Ryan (2017, p. 2) wrote: "For example, we might expect PLAY to be primarily associated with Enthusiasm, the communal aspect of Extraversion, and only secondarily with Assertiveness, Extraversion's agentic aspect." This is exactly what we observed with both being gregarious and excitement seeking to be most robustly associated with PLAY. Nevertheless, also assertiveness was associated with PLAY, but as hypothesized by the authors at a lower level. Note that in Montag & Davis (2018) PLAY was strongly linked with the *social* facet of Extraversion ($r = .46$; assessed with a 42 item Big Five scale by Olaru et al. (2015) and again much lower with assertiveness ($r = .33$). As can be observed in detail in the results section, it is indeed worthwhile to take a closer look at the facets of the FFM and their links to primary emotional systems, as some facets are more strongly associated with these emotional systems than others. With respect to SEEKING strongest associations can be observed with Openness's facets, Ideas and Actions (in Montag & Davis' work Openness intellectual of the 42 items Big Five scale), hence high SEEKING is associated with avoiding routines and being intellectual. CARE is most robustly associated with being tender, altruistic, high trusting and moral (in Montag & Davis work Agreeableness' helpful). Finally, FEAR most strongly links to Neuroticism's anxiety (in Montag & Davis' work depressed and stressed), ANGER to Neuroticism's angry hostility (irritated in Montag & Davis' work) and SADNESS among others to Neuroticism's anxiety/vulnerability (again depressed/stressed in Montag & Davis' work).

In addition to presenting associations between ANPS dimensions and the facets of the NEO-PI-R, the present work also introduces a Serbian version of the ANPS to the literature. Given the external validation of the ANPS with the data from the NEO-PI-R together with good psychometric properties of the Serbian ANPS (internal consistencies) and a replication of the factorial structure as presented in Davis et al. (2003) and Davis & Panksepp (2011), we hope that the Serbian ANPS will be a valuable addition to the toolbox of psychologists in the Serbian/Croatian research community.

Finally, we address some limitations. The sample size of the present work is rather small and unfortunately only a very limited number of male participants could be recruited for our research endeavor. This is noteworthy as gender effects have been observed on some of the ANPS scales, perhaps with the most robust linking higher scores in the CARE dimension to females compared to males. Such associations could not be investigated in the present work. Moreover, future studies clearly need to replicate the present associations with the ANPS and NEO-PI-R facets to get insights on the robustness of the findings. Aside from this, we stress that research endeavors testing principles of Affective Neuroscience Theory in the realm of Personality Neuroscience will strongly rely on the implementation of brain science methods going beyond self-report, something which we could not achieve with the present work. Finally, future works might also want to rely stronger on other more elaborate statistical methods such as structural equation modeling.

Contributions: CM and GK designed the present study. GK and LBL collected data in Serbia. GK and LBL translated the ANPS questionnaire. CM drafted the first version of the manuscript. CM and GK conducted the statistical analysis. KLD critically revised the present manuscript and improved the language. All authors approved the final version of this work.

Ethics statement: The present work has been approved by the ethics committee of the Serbian Psychological Association at the Faculty of Philosophy, University of Belgrade. All participants signed an informed consent and all procedures adhered to the principles of the Declaration of Helsinki.

Conflict of Interest: The authors have no conflict of interest with respect to this publication.

Financial Support: The position of CM was funded by a Heisenberg grant awarded to him by the German Research Foundation (DFG, MO2363/3-2). The study 1 was financially supported by the Ministry of Education, Science and Technological Development of Serbia, project No. 179018.

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Appendix 1.

The Affective Neuroscience Personality Scales (ANPS 2.4) - Serbian version

1. I najmanji problem ili glavolomka me zainteresuju.
2. Ljudi koji me poznaju bi rekli da sam anksiozna osoba.
3. Često imam snažnu potrebu da brinem o drugima.
4. Kada sam osujećen/a, obično se razbesnim.
5. Mene je lako zabaviti i nasmejati.
6. Često osećam tugu.
7. Osećanje stopljenosti sa svim postojećim moj život čini smislenijim.
8. Volim da ja budem taj/ta koji/a odlučuje u grupi.
9. Specijalni događaji koji treba da se dese ne proizvode unapred neku veliku radost kod mene.
10. Nisam često napet/a i nervozan/a.
11. Mislim da je besmisleno što neki ljudi toliko vode brigu o mladuncima životinja.
12. Čak i kad mi neko ide na živce, to ne traje dugo.
13. Moji prijatelji bi me verovatno okarakterisali kao previše ozbiljnu osobu.
14. Mislim da me odbacivanje ne pogađa nešto naročito.
15. Osećanje da sam deo svega postojećeg ne predstavlja neki važan izvor smisla u mom životu.
16. Povremeno pomalo ogovaram druge.
17. Jako se radujem novim iskustvima.
18. Često razmišljam šta sam sve mogao/la da uradim tek kad prilike prođu.
19. Volim da se staram o deci.
20. Moji prijatelji bi me verovatno opisali kao usijanu glavu.
21. Ja sam poznat/a po tome što umem da uživam i da se zabavim radeći.
22. Često imam osećaj da ću se rasplakati.
23. Često sam duhovno dirnut/a lepotom svega postojećeg.
24. Uobičajeno izbegavam aktivnosti u kojima bih ja bio/la centar pažnje.
25. Obično nisam previše radoznao/la.
26. Ne bih sebe opisao/la kao osobu koja je stalno zbog nečega zabrinuta.
27. Briga o bolesnoj osobi bi bila preveliki teret za mene.
28. Ne mogu da se setim momenta kada sam bio/la tako besan/a da sam hteo/la da nešto slomim.
29. U principu ne volim oštre igre koje zahtevaju fizički kontakt.
30. Retko sam tužan/na.
31. Retko se oslanjam na duhovnu inspiraciju kada se suočavam sa životnim izazovima.
32. Uvek govorim istinu.
33. U traženju odgovora se isto toliko uživa koliko i u nalaženju rešenja.
34. Često ne mogu odmah da zaspim zato što me nešto uznemiri.
35. Volim da budem sa mladuncima životinja.
36. Kad se naljutim, često mi dođe da psujem.
37. Volim da se šalim sa ljudima.
38. Često se osećam usamljen/a.
39. Za mene, osećanje povezanosti sa celokupnim životom na zemlji predstavlja važan izvor inspiracije.

40. Kad se igram, važno mi je da pobedim.
41. Uglavnom imam malo entuzijazma i pozitivnog uzbuđenja zbog nečega što treba da usledi.
42. Malo se čega bojim u životu.
43. Ne volim nešto specijalno da budem sa decom.
44. Retko pobesnim kad sam osujećen/a (frustriran/a).
45. Ne volim budalast humor.
46. Nikada nisam nostalgičan/na (Nikada ne osećam da mi dom nedostaje).
47. Za mene, duhovnost nije prvenstveni izvor unutrašnjeg mira i sklada.
48. Povremeno mi dođe da psujem.
49. Uživam da se pripremam i radim u pravcu nekog cilja skoro isto toliko koliko i u njegovom ostvarenju.
50. Ponekad ne mogu da prestanem da brinem o svojim problemima.
51. Osećam simpatije prema životinjama-lutalicama.
52. Kad me neko naljuti, budem jako dugo ljut/a.
53. Ljudi koji me znaju bi rekli da sam ja osoba koja jako voli zabavu.
54. Često mislim na ljude koje sam voleo/la, ali koji više nisu sa mnom.
55. Bavljenje duhovnim temama me često ispuni osećanjem strahopoštovanja i velikih mogućnosti.
56. Ako me kolege ili drugari nadmaše ja ću i dalje biti srećan/na ukoliko sam na pragu ostvarenja svojih ciljeva.
57. Uobičajeno nisam zainteresovan/a za rešavanje problema i glavolomki samo zato da bi ih rešio/la.
58. Moji prijatelji bi rekli da mnogo treba da bih se ja uplašio/la.
59. Uopšte uzevši, kućni ljubimci predstavljaju pre nevolju nego vrednost.
60. Ljudi koji me znaju bi rekli da se ja gotovo nikad ne razbesnim.
61. Ne uživam naročito u zevzečenju unaokolo i razmeni šaljivo-ironičnih opaski.
62. Ne ražalosti me nešto naročito kad me prijatelji ili roditelji osuđuju.
63. Moj osećaj značaja i svrhe u životu ne proizlazi iz mojih duhovnih uverenja.
64. Nikada se nisam pravio/la bolestan/om da bih se iz nečega izvukao/la.
65. Moja radoznalost me uvek nagoni da nešto radim.
66. Često brinem o budućnosti.
67. Beskućnici me rastuže.
68. Iziritira me kad neko pokuša da me spreči da uradim ono što hoću.
69. Ja sam veoma raspoložen/a, sklon/a šali i zabavi.
70. Često mislim o tome kako mogu da izgubim one koje volim.
71. Osećanje povezanosti sa ostatkom čovečanstva me motiviše da pravim moralnije izbore.
72. Kad se igram, ne smeta mi da gubim.
73. Retko osetim potrebu da samo izađem i nešto istražujem.
74. Malo me stvari čini anksioznim/om.
75. Ne volim kad drugi osećaju da sam im „neophodan/na“.
76. Retko se toliko razbesnim da mi dođe da nekog udarim.
77. Ne vidim mnogo toga duhovitog u nečemu što mnogi ljudi smatraju smešnim.
78. Retko imam osećaj da sam na ivici suza.
79. Ciljevi koje pred sebe postavljam nisu pod uticajem moje duhovnosti.
80. Bilo je trenutaka u mom životu kada sam se plašio/la mraka.
81. Kad god sam na nekom novom mestu, volim da istražim prostor i steknem bolji osećaj okruženja.
82. Često brinem da li sam doneo/la pravu odluku.
83. Ja sam od one vrste ljudi koja voli da dodiruje i grli druge.
84. Kada se stvari ne odvijaju onako kako ja želim, ponekad mi dođe da nešto šutiram i udaram.
85. Volim svaku vrstu igre, uključujući i one sa fizičkim kontaktom.

86. Često se osećam nesrećno kada ne mogu da budem sa svojim prijateljima ili sa onima koje volim.
87. Duhovna inspiracija mi pomaže da prevaziđem svoja ograničenja.
88. Nisam zadovoljan/na ako nisam ispred svojih vršnjaka.
89. Nisam od onih ljudi koji vole da isprobavaju i istražuju.
90. Retko sam zabrinut/a za svoju budućnost.
91. Ne želim nešto naročito da ljudi budu emocionalno bliski sa mnom.
92. Retko kad se toliko naljutim na nekoga da mi dođe da vrištim na njega.
93. Ne tražim često od drugih ljudi da mi se pridruže u zabavi.
94. Retko razmišljam o ljudima i vezama koje sam izgubio/la.
95. Moji izbori nisu vođeni osećanjem povezanosti sa svim postojećim.
96. Nikada nisam namerno slagao/la.
97. Često se osećam kao da bih skoro sve mogao/la da ostvarim.
98. Često se osećam nervozno i ne mogu da se opustim.
99. Ja sam osoba koja intenzivno oseća bol drugih ljudi.
100. Ponekad mi male čudljive stvari koje ljudi rade stvarno idu na živce.
101. Život vidim kao nešto što pruža bezbroj mogućnosti za zabavu.
102. Ja sam osoba koja snažno oseća bol zbog svojih ličnih gubitaka.
103. Kad radim na nekom projektu, volim da imam glavnu reč.
104. Među mojim najgorim strahovima su mogućnost da se osramotim ili da ispadnem glup/a.
105. Nisam naročito ljubopitljiva osoba.
106. Gotovo nikad nisam patio/la od nesanice kao posledice zabrinutosti zbog nečega.
107. Nisam naročito emocionalan/na.
108. I kad me ljudi iziritiraju, retko kad osetim potrebu da im kažem nešto ružno.
109. Ne volim nešto naročito da se igram.
110. Ne bi mi smetalo da provedem praznike ili odmor bez članova porodice ili prijatelja.
111. Nije mi stalo do toga da nadmašim svoje vršnjake.
112. Zbog straha da se ne osramotim, često izbegnem da nešto uradim ili kažem.

For reasons of direct comparison we also present the English items as presented in Davis & Panksepp (2011). For coding of the items see the syntax in the Open Science Framework depository as mentioned in method section.

Appendix 2.

The Affective Neuroscience Personality Scales (ANPS 2.4) - English version

1. Almost any little problem or puzzle stimulates my interest.
2. People who know me well would say I am an anxious person.
3. I often feel a strong need to take care of others.
4. When I am frustrated, I usually get angry.
5. I am a person who is easily amused and laughs a lot.
6. I often feel sad.
7. Feeling a oneness with all of creation helps give more meaning to my life.
8. I like to be the one in a group making the decisions.
9. I do not get much pleasure out of looking forward to special events.
10. I am not frequently jittery and nervous.
11. I think it is ridiculous the way some people carry on around baby animals.
12. I never stay irritated at anyone for very long.
13. My friends would probably describe me as being too serious.
14. I seem to be affected very little by personal rejection.
15. Feeling like a part of creation is not an important source of meaning for my life.
16. I will gossip a little at times.
17. I really enjoy looking forward to new experiences.
18. I often think of what I should have done after the opportunity has passed.
19. I like taking care of children.
20. My friends would probably describe me as hotheaded.
21. I am known as one who keeps work fun.
22. I often have the feeling that I am going to cry.
23. I am often spiritually touched by the beauty of creation.
24. I usually avoid activities in which I would be the center of attention.
25. I am usually not highly curious.
26. I would not describe myself as a worrier.
27. Caring for a sick person would be a burden for me.
28. I cannot remember a time when I became so angry that I wanted to break something.
29. I generally do not like vigorous games which require physical contact.
30. I rarely become sad.
31. I rarely rely on spiritual inspiration to help me meet important challenges.
32. I always tell the truth.
33. Seeking an answer is as enjoyable as finding the solution.
34. I often cannot fall right to sleep because something is troubling me.
35. I love being around baby animals.
36. When I get angry, I often feel like swearing.
37. I like to joke around with other people.
38. I often feel lonely.

39. For me, experiencing a connection to all of life is an important source of inspiration.
40. When I play games, it is important for me to win.
41. I usually feel little eagerness or anticipation.
42. I have very few fears in my life.
43. I do not especially like being around children.
44. When I am frustrated, I rarely become angry.
45. I dislike humor that gets really silly.
46. I never become homesick.
47. For me, spirituality is not a primary source of inner peace and harmony.
48. Sometimes I feel like swearing.
49. I enjoy anticipating and working towards a goal almost as much as achieving it.
50. I sometimes cannot stop worrying about my problems.
51. I feel softhearted towards stray animals.
52. When someone makes me angry, I tend to remain fired up for a long time.
53. People who know me would say I am a very fun-loving person.
54. I often think about people I have loved who are no longer with me.
55. Contemplating spiritual issues often fills me with a sense of intense awe and possibility.
56. If my peers have outperformed me, I would still be happy, if I have nearly met my goals.
57. I am usually not interested in solving problems and puzzles just for the sake of solving them.
58. My friends would say that it takes a lot to frighten me.
59. I would generally consider pets in my home to be more trouble than they are worth.
60. People who know me well would say I almost never become angry.
61. I do not particularly enjoy kidding around and exchanging “wisecracks.”
62. It does not particularly sadden me when friends or family members are disapproving of me.
63. My sense of significance and purpose in life does not come from my spiritual beliefs.
64. I have never “played sick” to get out of something.
65. My curiosity often drives me to do things.
66. I often worry about the future.
67. I feel sorry for the homeless.
68. I tend to get irritated if someone tries to stop me from doing what I want to do.
69. I am very playful.
70. I tend to think about losing loved ones often.
71. Feeling a connection with the rest of humanity motivates me to make more ethical choices.
72. When I play games, I do not mind losing.
73. I rarely feel the need just to get out and explore things.
74. There are very few things that make me anxious.
75. I do not like to feel “needed” by other people.
76. I rarely get angry enough to want to hit someone.
77. I do not tend to see the humor in things many people consider funny.
78. I rarely have the feeling that I am close to tears.
79. The goals I set for myself are not influenced by my spirituality.

80. There have been times in my life when I was afraid of the dark.
81. Whenever I am in a new place, I like to explore the area and get a better feel for my surroundings.
82. I often worry about whether I am making the correct decision.
83. I am the kind of person that likes to touch and hug people.
84. When things do not work out the way I want, I sometimes feel like kicking or hitting something.
85. I like all kinds of games including those with physical contact.
86. I frequently feel downhearted when I cannot be with my friends or loved ones.
87. Spiritual inspiration helps me transcend my limitations.
88. I am not satisfied unless I can stay ahead of my peers.
89. I am not the kind of person that likes probing and investigating problems.
90. I rarely worry about my future.
91. I do not especially want people to be emotionally close to me.
92. I hardly ever become so angry at someone that I feel like yelling at them.
93. I do not frequently ask other people to join me for fun activities.
94. I rarely think about people or relationships I have lost.
95. My choices are not guided by a sense of connectedness with all of life.
96. I have never intentionally told a lie.
97. I often feel like I could accomplish almost anything.
98. I often feel nervous and have difficulty relaxing.
99. I am a person who strongly feels the pain of other people.
100. Sometimes little quirky things people do really annoy me.
101. I see life as being full of opportunities to have fun.
102. I am a person who strongly feels the pain from my personal losses.
103. When working on a project, I like having authority over others.
104. Being embarrassed or looking stupid are among my worst fears.
105. I am not an extremely inquisitive person.
106. I almost never lose sleep worrying about things.
107. I am not particularly affectionate.
108. When people irritate me, I rarely feel the urge to say nasty things to them.
109. Playing games with other people is not especially enjoyable for me.
110. It would not bother me to spend the holidays away from family and friends.
111. Striving to be better than my peers is not important for me.
112. Fear of embarrassment often causes me to avoid doing things or speaking to others.