Title:

Portuguese version of the Arousal Predisposition Scale: Preliminary evidence for a two-factor structure in a nonclinical sample

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Abstract

It is known that there is significant variability in arousal levels of the individuals. The Arousal Predisposition Scale (APS) is a questionnaire intended to measure individual differences in arousability. In the current work, our aim was to present the initial psychometric properties of the Portuguese version of the APS. Three hundred and forty-five undergraduate medical students from both sexes were enrolled. All participants filled out a set of questionnaires - which contained the APS - at the end of their lectures and out of evaluation period. The APS showed good internal consistency (α = .85) and discriminated individuals with extreme scores. Further, in general, the scale

discriminated as well both sexes pertaining to the individual items and total score. In terms of scale structure, two-related factors were extracted (F1 = emotional reactivity and F2 = trait anxiety). Significant associations among APS and other sleep and psychological self-report variables were also observed. The APS seems to be a reliable and valid instrument to assess self-reported physiological arousability, at least in a sample of young adults. The two-factor composition will require more studies to be replicated in similar groups, and particularly, in clinical samples.

Keywords: arousability; physiological arousal; stress; insomnia; scale

1. Introduction

In the integrative model of Lundh and Broman (2000) sleep-interfering and sleep-interpreting processes may combine to produce the complaint of insomnia. Among the variables proposed as vulnerabilities for sleep-interfering processes, arousability is one of the most important ones (i.e., being sensitive and easily hurt, being unable to take life easy, slow recuperation after stress) (Altena et al., 2017; Lundh & Broman, 2000; Marques, Gomes, Clemente, Santos, & Castelo-Branco, 2016; Perlis, Ellis, Kloss, & Riemann, 2016).

The arousability is a personality trait related to somatic or physiological activation (Coren & Mah, 1993). Coren (1988) conceptualizes arousability as a predisposition toward arousal that manifests itself not only in the predormital period, but also as a long-term behavioral trait. There are significant individual differences regarding activation or arousal levels. Among existing self-report instruments designed to measure individual differences in arousability, the Arousal Predisposition Scale (APS) is the only one whose items´ selection was based on their power to predict a global measure of insomnia (Altena et al., 2017; Coren, 1988; Coren & Mah, 1993). Nevertheless, the APS has been utilized in many other domains, such as in studies on vulnerability to psychosis (Clamor, Warmuth, & Lincoln, 2015), anti-social behavior (Coren, 1999), bullying behavior (Woods & White, 2005), dreaming (Hicks, Eileen, & Brassington, 2002), cancer (Savard, Villa, Ivers, Simard, & Morin, 2009) and in college students (Fernández-Mendoza et al., 2010; Saliba, Henderson, Deane, & Mahar, 1998). Moreover, it also has been used in insomnia disorder (Beaulieu-Bonneau, LeBlanc, Mérette, Dauvilliers, & Morin, 2007; Dekker, Benjamins, Van Straten, Hofman, & Van Someren, 2015; LeBlanc et al., 2009).

The APS is a short scale comprising 12 items to be responded in a 5 point Likert-scale (1 = never / or almost never to 5 = always / or almost always). The score of the scale results from the sum of all items. The item 1 is reverse scored (5 = never / or almost never to 1 = always / or almost always). Higher scores in the APS denotes higher arousability. The APS has demonstrated good reliability and validity indicators. Its validity was studied originally recurring to physiological measures which denote good construct validity (Coren, 1990; Coren & Mah, 1993). The hypothesis of a general hyperarousal disturbance in insomnia demanded the development of reliable and valid instruments to measure it (AASM, 2014; APA, 2013; Riemann et al., 2010). Despite all the interest in the scale, surprisingly, very few studies have investigated its psychometric properties in a systematic way.

In the current study, our aim is to report the preliminary psychometric properties of a European Portuguese version of APS and investigate its exploratory factor structure. It is hypothesized that women have higher arousability levels than men as it was observed by Coren (1990). Additionally, it is expected that the APS show significant associations with pre-sleep cognitive and somatic arousal, sleep-related reactivity, insomnia, sleep quality, neuroticism, and worry and rumination measures.

2. Methods

Participants

In total, a sample comprising 343 participants was recruited (men: n = 116; mean age = 19.28; SD = 1.29 / women: n = 227; mean age = 19.25; SD = 1.28). It was found that the proportion of women in the sample was significantly higher than the proportion of the men ($\chi^2_{(1)} = 35.921$; $p < .001$). This is somehow expected as there are a more proportion of women studying in Higher Education (Morley, 2010). However, both

groups were identical concerning age ($t_{(341)} = 0.199$; $p = .843$). The present study included students from the first three years of medicine course were enrolled (1st year = 40.5%; 2nd year = 26.5%; 3rd year = 32.7%; missing = 0.3%). All participants were single.

Measures

Arousal Predisposition Scale (APS)

The APS is constituted by 12 items measuring predisposition to arousability. Each item is answered on a 4-point scale (1=almost never to 4=almost always). Higher scores are associated with greater predisposition to arousability (Coren & Mah, 1993). The first item is inversely coded (i.e., “I am a calm person”).

The APS was translated from English into Portuguese by a psychiatrist (MD / PhD) who has extensive experience with the assessment and treatment of patients with insomnia and on the translation of psychological assessment instruments (MHPA). It was then back-translated into English by a bilingual translator without previous knowledge of the scale and a general overlap with the original English version was found. It should be noted that the scale response options were slightly modified. That is, for this work on the APS the first and second options contained in the original version of APS (i.e., never / almost never and seldom) were joined into a single option (i.e., almost never). Hence, four response options were considered instead of the original five options. As a matter of fact, this option for the Portuguese version of the APS is related to the low frequencies of responses for option 1 ("Never / almost never"). For scoring purposes, the first two original category responses were combined to make up a more robust and meaningful category not interfering in the scale’s purpose. Besides, this

transformation in response options makes APS scoring similar to the Eysenck Personality Inventory.

Eysenck Personality Inventory (EPI)

The short version of the EPI (EPI-12, Eysenck & Eysenck, 1964) is a 12-item tool to assess Neuroticism and Extroversion dimensions. In the current work only Neuroticism (NE) – 6 items was used. The item 12 "I suffer from sleeplessness" was removed from the computation of this dimension, as it might constitute a confounding variable. The Cronbach´s alpha was .61. For this study, the Portuguese version by Silva, Azevedo and Dias (1994) was used.

Self-reported insomnia

Self-reported insomnia was assessed with item 12 (“I suffer from sleeplessness/insomnia”) from the EPI-12 which is scored from 1 = almost never to 4 = almost always.

Pre-Sleep Arousal Scale (PSAS)

The PSAS contains 16 items, each rated on a 5-point scale that describes symptoms of arousal at bedtime (Nicassio, Mendlowitz, Fussell, & Petras, 1985). Eight items evaluates cognitive arousal and eight evaluates somatic arousal. Higher scores suggest higher pre-sleep arousal. In the current study, the Cronbachs´ alphas for somatic and cognitive arousal were .81 and .77, respectively. For this study, the Portuguese version by Azevedo et al. (2010) was used.

Ford Insomnia Response to Stress Test (FIRST)

The FIRST is a self-report scale designed to assess sleep-related 'reactivity' i.e., the tendency to exhibit pronounced sleep disturbance in response to a sleep challenge. Greater scores denote higher vulnerability to stress-related sleep disturbance (Drake, Richardson, Roehrs, Scofield, & Roth, 2004). In the current study, the Cronbach´s alpha was .80. For this study, the Portuguese version by Marques, Gomes, Drake, Roth and Azevedo (2016) was used.

Sleep Quality Index (SQI)

SQI is a composite measure constituted by items concerning sleep depth, subjective sleep quality, sleep latency (minutes) and nocturnal awakenings (number). The score ranges from 3 to 21. Higher scores denote poorer sleep quality. In the current study, the Cronbach´s alpha was .65. This is an original Portuguese measure used in other studies - cf. Marques, Gomes, Ferreira and Azevedo (2016).

Repetitive thought

The general tendency to worry and overthinking/rumination was measured with a scale comprising four items: Two items assess the tendency to worry: (i.e., "I worry a lot" and "The people around me consider that I worry a lot") and two items assess the tendency to overthinking/rumination (i.e., "I think a lot over things" and "The people around me consider that I think a lot over things"). Each item is scored from 1=almost never to 4=almost always (Pereira et al., 2012). In the current study, the Cronbachs` alphas for the worry and overthinking/rumination were .70. and .77, respectively. This is an original Portuguese measure used in other studies - cf. Marques et al. (2016).

Procedures

This study was approved by the Ethics Committee and the Scientific Council of the Faculty of Medicine of the University where the data were collected. The professors were initially contacted in order to obtain authorization to administer the questionnaires to the students at the beginning/ending of a class session (out of the evaluation period). The aims of the study were explained to the students, it was emphasized that their cooperation was voluntary, and confidentiality was ensured. All participants accepted to collaborate in the study.

Data Analysis

All the data were analyzed with IBM SPSS Statistics™ v.22 for Windows. Descriptive statistics such as means, standard deviations and amplitudes were computed to characterize the sample. For inferential statistics purposes Pearson product-moment correlations were calculated to examine associations among variables and independent samples *t*-tests and One-way ANOVAs to explore differences among groups. The effect sizes interpretation was based on Cohen´s guidelines i.e., 0.2 = small; 0.5 = medium; 0.8 = large (Field, 2013). To investigate factor structure of the APS, an exploratory factor analysis (Principal Axis Factoring) was used followed by a Direct Oblimin rotation since it was expected that the factors were correlated (Field, 2013).

3. Results

Descriptive statistics

Total mean score of APS ranged from 12 to 43 (M = 25.17; SD = 6.25). For males, the total mean score was 22.56 (SD = 5.87) and for females was 26.50 (SD = 6.02). The difference was statistically significant achieving a medium effect size [$t_{(341)}$ = -5.775; p

< .001; Cohen´s *d* = 0.66]. Normality of variables was assumed considering that all of the items did not surpass skewness and kurtosis coefficients of 1. In addition, the sample size either considering the total sample or both sexes independently allowed that parametric inferential statistics could be used without major concerns (Field, 2013; Tabachnick & Fidell, 2012).

Reliability

The reliability of the APS was studied through internal consistency. It was found a Cronbach´s alpha of .85 for the total scale. All the 12 items were relevant for the reliability of the scale (cf. Table 1). The minimum corrected item-total correlation was *r* = .36 (item 12) and the maximum was *r* = .65 (item 5). Correlation matrix regarding all APS items is displayed in Table 2.

INSERT TABLE 1

INSERT TABLE 2

Structure of the APS

To investigate the structure of the APS it was performed an Exploratory Factor Analysis with Principal Axis Factoring method followed by a Direct Oblimin rotation. The basic conditions to compute successfully this analysis were fulfilled: *R*-matrix containing most of variables around *r* = 0.3; Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) = 0.862 (> .60), and significant Bartlett´s test of sphericity ($\chi^2_{(66)}$ = 1358.175; *p* < .001). Two factors were retained accounting for 41% of total variance (cf. Table 3). Therefore, the first factor was labeled “emotional reactivity” and the second

factor was labeled “trait anxiety”. Only factor loadings ≥ .30 were considered. Correlation between the factors was $r = .68$; $p < .001$.

INSERT TABLE 3

Association with other self-report measures

In order to establish convergent validity, the association between the APS and its extracted factors and other variables was studied (cf. Table 4). Overall, it was found adequate correlations among all the variables. Specifically, regarding APS total scores, the maximum value of correlation observed was with neuroticism ($r = .68$) and the minimum was with nocturnal awakening ($r = .11$). With respect to “emotional reactivity” factor of APS, the maximum correlation was with neuroticism ($r = .67$) and the minimum was with nocturnal awakening ($r = .08$), a pattern identical to the APS total score. Concerning “trait anxiety” factor of APS, the maximum and the minimums were neuroticism ($r = .53$) and subjective sleep quality ($r = .12$), respectively.

INSERT TABLE 4

Scores of the APS by sex

All the items and both subscales of APS were investigated taking into account the sex of participants. Overall, it was observed that in all the APS items women scored higher than men. This pattern was also observed when considering either the total samples or both subscales/factors (cf. Table 5). The majority of effect sizes were medium considering Cohen´s guidelines (Field, 2013).

INSERT TABLE 5

Discrimination analysis of extreme groups (P_{20} and P_{80})

In order to evaluate the discriminative power of the items comprising the APS, percentiles 20 (value = 20) and 80 (value = 31) were calculated and, consequently, two groups were created. All items, subscales and total scores were compared between both groups. The results showed that these extreme groups were significantly different among themselves (cf. Table 6). All effect sizes were large considering Cohen´s guidelines (Field, 2013).

INSERT TABLE 6

4. Discussion

Our aim in this study was to study the preliminary properties of a European Portuguese version of the APS. As it is a commonly used measure in the literature, its study and adaptation into Portuguese Language seems to be of utmost relevance. The appropriate internal consistency of the scale and its factors guarantee the quality and contribution of all the items to the measure of arousability. In the present work, the Cronbach´s alpha for APS total score was .85. This is an identical value to the one found in the original validation study (α = .84) by Coren (1988). Additionally, in the study by Saliba et al. (1998), the Cronbach´s alpha was .83.

As it was hypothesized, the APS (total and both factors) correlated with other measures, namely, pre-sleep cognitive and somatic arousal, sleep-related reactivity, insomnia, sleep quality, neuroticism, worry and rumination. In other words, individuals with higher arousability levels denote higher levels of pre-sleep arousal, stress-related

sleep disturbance, self-reported insomnia, more neuroticism and self-reported worry/overthinking. Interestingly, the correlation pattern is quite similar for APS total score and APS cognitive arousal scale, thus, it can be suggested that the APS seems to be a better measure for cognitive arousal, at least in this sample of young-adults.

It is notable that the APS total mean value of the current study was quite similar to the one observed by Jarrin, Chen, Ivers and Morin (2014) in a population-based sample of good sleepers (M = 28.2; SD = 6.9).

When the comparison of sexes was performed, it was found that women have a greater score on the APS total score (and its factors) than men, a finding that is similar to the one observed by Coren (1990), with identical difference in scores, and Saliba et al. (1998). This finding is also in accordance with the idea that women report higher levels of psychological distress and insomnia (Perlis et al., 2016). The mean scores by sex in the current study (i.e., women = 26.5 and men = 22.5) is significantly lower than other studies that have been used the APS [Coren (1990): women = 37.6 and men = 35.9; Saliba et al. (1998): women = 35.9 and men = 31.3]. This fact may be due to the reduction of the category responses range from 5 to 4 options.

The large effect sizes that are observed when the percentiles 20 and 80 are compared, suggest that the Portuguese version of the APS seems to be a scale that enables the differentiation concerning levels of arousability among individuals, even when it is analyzed a sample constituted mostly by healthy young adults, as it is the case of this study.

Beyond the adequate internal consistency and convergent and criterion validity indicators (i.e., discrimination of scores by sex and extreme scores) that were presented, perhaps the most striking finding has been the alternative factorial solution against the one most frequently observed in the literature (i.e., the APS as a unidimensional

construct). In our study, two factors emerged accounting for 41% of the variance. These factors were named “emotional reactivity” and “trait anxiety”, respectively. Factor 1 (emotional reactivity), which explained more variance, comprised all the items but the items 1, 5 and 7. When a qualitative analysis of the items is carried out, it can be observed that those three items (i.e., "I am a calm person", "I am restless and fidgety" and “I get excited easily”) are more related to a stable characteristic connected with anxiety and arousal, thus, they were labeled as “trait anxiety”. Saliba et al. (1998) also suggested that APS evaluates a component of trait anxiety as measured by STAI-T. On the other hand, the remaining nine items seem to be associated with affective chronometry, hence, the label: “emotional reactivity”. Affective chronometry refers to “the study of individual differences in temporal features of affect such as rate of change, which refers to how rapidly affect increases (enhancement rate) or decreases (decay rate) over time” (Hemenover, 2003, p. 121). This is fairly associated with the threshold for reactivity (Davidson, 1998) and it is also in line with characteristics of arousability (i.e., tendency to respond with arousal), and slow habituation (i.e., a slow return to baseline level after having been aroused) proposed in the Lundh and Broman’s model (2000) as relevant individual differences for the development of insomnia.

For example, in insomnia, the suggested hypothesis is that the patients are characterized by slow decay of negative and rapid decay of positive affect over time. In turn, healthy individuals may be characterized by rapid decay of negative and slow decay of positive affect over time (Hemenover, 2003). That said, the APS appears to be a scale most tailored to evaluate emotional reactivity. In future studies interested on this construct, this subscale of the APS may be a valid option to introduce in assessment protocols.

Up to now, there are scarce studies on the psychometric properties of the APS (Coren & Mah, 1993; Hicks, Conti, & Nellis, 1992; Saliba et al., 1998); however, this is a tool frequently used in several studies, in particular in sleep and insomnia research.

Summarizing, the two-factor structure found in this study, albeit theoretical solid, it should be taken into account the nature of the current sample. Besides, it obviously should be seen as an exploratory or preliminary suggestion to be furthered investigated. Notwithstanding, it opens a new avenue for research of this widely used scale.

Some limitations concerning the current study should be highlighted: Absence of data on temporal stability of the scale, unbalanced proportion of males and females, and the convenience nature of the sample. Even so, the study of a healthy sample such as the college students is relevant to study the development and the vulnerability factors to several disorders, including insomnia and other sleep disturbances (Lund, Reider, Whiting, & Prichard, 2010). In addition, even in community or healthy populations there is a percentage of clinical cases that may or may not be diagnosed (Schmidt, Gay, & Van der Linden, 2009).

One should note that whether the replication of this two-factor structure is guaranteed, both trait-anxiety and emotional reactivity may be used as independent and parsimonious scale in research projects in which the brevity is a demanded condition.

For further research, some topics are important to posit: using various clinical groups (e.g., sleep disturbed and anxiety disordered individuals), checking the two-factor solution proposed in the current paper and its goodness-of-fit either in college samples of different cultures and other groups, and investigate the associations of the APS and its subscales or factors with neurobiological and psychophysiological measures. In the case of the college students, it would be interesting to replicate this study in an evaluation period and compare them with the period out of evaluations. It

would be also very insightful to study the role of both subscales in insomnia patients and verify whether there is a differential pattern of scores taken into account the insomnia subtypes (e.g., initial, intermediate, terminal, and mixed). Finally, a confirmatory factor analysis may give a useful contribute to determine the appropriateness of the two-factor structure and compare it with the single-factor structure.

Note: Part of the data presented in this paper were shown in a poster presentation at the 23rd Congress of the European Sleep Research Society (ESRS) which took place in Bologna, Italy, 13 - 16 September, 2016.

Compliance with Ethical Standards

Conflict of Interest: The authors declare that they have no conflict of interest.

Research involving Human Participants and/or Animals

This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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Table 1. Corrected item-total correlations and Cronbach´s alpha if item is excluded

	Corrected item-total correlation	Alpha if item deleted
1. I am a calm person	.488	.845
2. I get flustered if I have several things to do at once	.438	.848
3. Sudden changes of any kind produce an immediate emotional effect on me	.542	.841
4. Strong emotions carry over for one or two hours after I leave the situation which caused them	.558	.840
5. I am restless and fidgety	.650	.833
6. My mood is quickly influenced by entering new places	.444	.848
7. I get excited easily	.595	.837
8. I find that my heart keeps beating fast for a while after I have been “stirred up”	.615	.836
9. I can be emotionally moved by what other people consider to be simple things	.488	.845
10. I startle easily	.499	.844
11. I am easily frustrated	.630	.835
12. I tend to remain excited or moved for a long period of time after seeing a good movie	.361	.854

Table 2. *R*-matrix for APS items

r	APS_1	APS_2	APS_3	APS_4	APS_5	APS_6	APS_7	APS_8	APS_9	APS_10	APS_11	APS_12
APS_1	-											
APS_2	.28	-										
APS_3	.30	.39	-									
APS_4	.32	.21	.37	-								
APS_5	.64	.33	.38	.36	-							
APS_6	.16	.22	.31	.30	.30	-						
APS_7	.53	.25	.26	.33	.67	.28	-					
APS_8	.30	.29	.36	.53	.45	.37	.43	-				
APS_9	.11	.21	.28	.39	.25	.24	.27	.40	-			
APS_10	.22	.30	.28	.28	.32	.25	.38	.37	.35	-		
APS_11	.35	.34	.52	.40	.44	.37	.47	.34	.34	.40	-	
APS_12	.12	.16	.21	.25	.20	.21	.11	.28	.45	.23	.26	-

Table 3. Factorial solution for the APS

Items	I	II
9. I can be emotionally moved by what other people consider to be simple things	.746	
12. I tend to remain excited or moved for a long period of time after seeing a good movie	.577	
8. I find that my heart keeps beating fast for a while after I have been "stirred up"	.563	
4. Strong emotions carry over for one or two hours after I leave the situation which caused them	.543	
11. I am easily frustrated	.488	
3. Sudden changes of any kind produce an immediate emotional effect on me	.468	
10. I startle easily	.462	
6. My mood is quickly influenced by entering new places	.433	
2. I get flustered if I have several things to do at once	.319	
5. I am restless and fidgety		-.791
1. I am a calm person		-.752
7. I get excited easily		-.680
Cronbach´s alpha	.79	.72
Eigenvalue	4.669	1.362
Variance explained (%)	34.33	7.10
Total variance explained (%)	41.43	

Note. Only component loadings ≥ .30 were considered for Component Matrix. Extraction Method: Principal Axis Factoring; Rotation: Direct Oblimin (Delta = 0).

Table 4. Associations among the APS and psychological and sleep variables

	APS	APS (F1)	APS (F2)
	r	*r*	*r*
Neuroticism	.68**	.67**	.53**
Worry	.53**	.49**	.48**
Rumination	.38**	.38**	.27**
Insomnia	.30**	.26**	.32**
Sleep Reactivity to Stress	.54**	.53**	.42**
Cognitive Arousal	.40**	.40**	.30**
Somatic Arousal	.38**	.36**	.31**
Sleep Latency	.19**	.15*	.24**
Nocturnal Awakenings	.11*	.08	.15*
Subjective Sleep Quality	.16*	.16*	.12*
Latency + Nocturnal Awakenings	.17**	.16*	.16*
Sleep Quality Index	.22**	.19**	.23**

*p<.05; ** p<.001
Note. APS (F1) = Emotional Reactivity; APS (F2) = Trait Anxiety.

Table 5. Mean differences between males and females concerning individual APS items and APS total score

	[1] Males (n = 116)	[2] Females (n = 227)	Test		Effect Size
	M (*SD*)	*M* (*SD*)	*t*	df	*d*
1. I am a calm person	1.62 (.76)	2.09 (.79)	-5.224**	341	0.60
2. I get flustered if I have several things to do at once	2.19 (.70)	2.41 (.77)	-2.689*	250.162	0.29
3. Sudden changes of any kind produce an immediate emotional effect on me	1.93 (.68)	2.30 (.83)	-4.318**	277.455	0.48
4. Strong emotions carry over for one or two hours after I leave the situation which caused them	2.23 (.88)	2.47 (.75)	-2.559*	341	0.29
5. I am restless and fidgety	1.65 (.76)	2.04 (.88)	-4.062**	341	0.47
6. My mood is quickly influenced by entering new places	2.07 (.84)	2.29 (.82)	-2.300*	341	0.26
7. I get excited easily	1.74 (.80)	2.17 (.83)	-2.824**	341	0.52
8. I find that my heart keeps beating fast for a while after I have been “stirred up”	2.03 (.80)	2.31 (.87)	-2.904*	250.089	0.33
9. I can be emotionally moved by what other people consider to be simple things	1.87 (.86)	2.11 (.86)	-2.485*	341	0.27
10. I startle easily	1.59 (.71)	2.19 (.92)	-6.649**	290.078	0.73
11. I am easily frustrated	1.82 (.80)	2.24 (.87)	-4.342**	341	0.50
12. I tend to remain excited or moved for a long period of time after seeing a good movie	1.82 (.88)	1.89 (.83)	-0.729	341	0.08
F1. Emotional Reactivity	17.27 (4.47)	20.07 (4.51)	-5.461**	341	0.62
F2. Trait Anxiety	5.30 (1.83)	6.44 (2.03)	-5.048**	341	0.58
APS total	22.56 (5.87)	26.50 (6.02)	-5.775**	341	0.66

* $p < .01$; ** $p < .001$

Note. For the items 2, 3, 8 and 10 the homogeneity of variances was not assumed.

Table 6. Mean differences between low and high APS groups concerning individual items and total score

	[1] Low APS group P ≤ 20 (*n* = 82)	[2] High APS group P ≥ 80 (*n* = 74)	Test		Effect Size
	M (*SD*)	*M* (*SD*)	*t*	df	*d*
1. I am a calm person	1.34 (.59)	2.66 (.70)	-12.679**	154	2.03
2. I get flustered if I have several things to do at once	1.82 (.56)	2.82 (.74)	-9.397**	135.950	1.52
3. Sudden changes of any kind produce an immediate emotional effect on me	1.57 (.52)	2.86 (.83)	-11.463**	120.278	1.86
4. Strong emotions carry over for one or two hours after I leave the situation which caused them	1.66 (.63)	3.15 (.65)	-14.438**	154	2.32
5. I am restless and fidgety	1.11 (.35)	2.77 (.71)	-18.146**	104.049	2.96
6. My mood is quickly influenced by entering new places	1.49 (.61)	2.76 (.84)	-10.669**	132.435	1.73
7. I get excited easily	1.29 (.48)	2.85 (.69)	-16.073**	128.552	2.62
8. I find that my heart keeps beating fast for a while after I have been “stirred up”	1.43 (.54)	3.07 (.68)	-16.571**	154	2.67
9. I can be emotionally moved by what other people consider to be simple things	1.34 (.57)	2.76 (.84)	-12.164**	126.674	1.97
10. I startle easily	1.24 (.48)	2.62 (.82)	-12.564**	115.847	2.05
11. I am easily frustrated	1.43 (.56)	3.14 (.66)	-17.342**	154	2.79
12. I tend to remain excited or moved for a long period of time after seeing a good movie	1.39 (.60)	2.49 (.88)	-8.981**	127.476	1.46
F1. Emotional Reactivity	13.23 (1.93)	25.45 (2.43)	-34.872**	154	5.56
F2. Trait Anxiety	3.88 (.88)	8.50 (1.31)	-25.494**	125.410	4.14
APS total	17.10 (2.17)	33.94 (2.80)	-41.570**	137.408	6.72

** $p < .001$

Note. For the items 2, 3, 5, 6, 7, 9, 10, 12, APS-F2 and APS total score the homogeneity of variances was not assumed. P = Percentile.