Original article

Validation study of the Spanish brief version of TEMPS-A

Jessica Zapata-Téllez [a], Hiram Ortega-Ortiz [b,*], Lizette Quiroz-Casián [c],
Claudia Becerra-Palars [d], María del Carmen Elizabeth Lara-Muñoz [e], Gustavo H. Vázquez [f]

[a] *National Council of Science and Technology and National Institute of Psychiatry, Mexico*
[b] *Affective Disorders Clinic, National Institute of Psychiatry "Ramón de la fuente Muñiz", Mexico City, Mexico*
[c] *Endocrinology Department and Obesity and Eating Disorders Clinic, National Institute of Nutrition and Medical Sciences "Salvador Zubirán", Mexico*
[d] *Chair of Clinical Services, National Institute of Psychiatry "Ramón de la fuente Muñiz", Mexico City, Mexico*
[e] *Faculty of Medicine, Benemérita Universidad Autónoma de Puebla, Puebla, Mexico*
[f] *Department of Psychiatry, Queen's University, Ontario, Canada*

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ABSTRACT

Introduction: Identifying affective temperaments could be useful both for understanding the normal behavioral variations in the general population and to establish if there is a clinical predisposition to certain disorders. Five affective temperaments have been proposed: depressive, cyclothymic, hyperthymic, irritable and anxious. Original instrument for measuring them (TEMPS-A) is a 110-item scale but many short versions in different languages have been validated. The aim of this study was to obtain a short self-administered Spanish version of TEMPS-A with good psychometric properties.
Materials and methods: A sample of 550 students who answered the argentinean version of TEMPS-A was included, after psychometric analysis a comparison between inpatients with major depression and their matched controls by sex and age who answered the brief version was performed to get an external validation.
Results: The sample was composed by 298 (54.2%) women. The mean age was 23.3 year (*SD* = 6.2). A forced five factor analysis was performed. The 7 items with the highest factorial load (more than 0.350) for each subscale were included in the brief version. The Cronbach alpha's ranged from 0.690 to .800. The most prevalent temperament was hyperthymic followed by cyclothymic for students sample. Similarities between students and controls sample were observed, but not with patients with major depression.
Conclusions: This brief Spanish version of TEMPS-A (35 items) has good psychometric properties and can be used in general and clinical population.

Introduction

The Temperament Evaluation of Memphis, Pisa, Paris and San Diego – TEMPS – is a psychometric instrument that was developed about 1987 by H.S. Akiskal and G. Mallya.[1] The aim was to measure the temperamental affective traits along lifetime. The initial version was a semi-structured 32 items interview and then a 110 items self-administered version was developed[2] which comprises 5 dimensional subscales belonging to the affective temperaments proposed: depressive, cyclothymic, hyperthymic, irritable and anxious.

Temperament can be understood as those traits of behavior that keep stable over time and that are strongly related to an affective basal modulation. Theoretic model of affective temperaments posits that there could be very subtle temperament manifestations on one side going to clearly dysfunctional and even considered as pathological manifestations on the other. This frame goes in hand with Kretschmer's view who stated that bipolar disorder patients used to have a premorbid

personality very similar to the clinical presentation of some disorders but with less intensity. Leonhard pointed out that some particular temperaments were frequently observed in relatives of patients, like an attenuation of manic, melancholic or mixed states.[3]

Affective temperaments can also be related to physiologic activation in response to ambient stimuli, modulating the basal affective tone and the individual activity and emotional variability. They can also be associated with symptomatic presentation of some states and response to treatment.[4]

Depressive temperament is observed in subjects with low energy, negativist, sad, who tend to ruminate, indolent, shy, passive, self-critic, skeptic, given up to others and over dedicated. Cyclothymic temperament describes subjects that experience short periods of time with an augmentation of some functions or traits and then an alternation with a decrease in the same functions beyond the normal or basal affective tone, for example hypersomnia or decreased sleep requirement, introversion or sociability, unexplained sadness or excessive of joy, pessimism or optimism, and a tendency to show generalized instability in different areas of their lives. Hyperthymic temperament: includes subjects who are cheerful, expansive, optimistic, confident, versatile,

* Corresponding author.
E-mail address: drhiramortega@hotmail.com (H. Ortega-Ortiz).

novelty seekers, tireless, with excessive confidence and tendency to leadership. Irritable temperament describes individuals who are prone to sadness but dominated by irritability and periods of dysphoric fidgetiness, lack of satisfaction, embittered view and bad attitude. Anxious temperament is often found in subjects that show excessive worries about survival of others and themselves.[5]

Identifying affective temperaments could be useful both for understanding the normal behavioral variations in the general population and to establish if there is a clinical predisposition to certain disorders. Some studies have already associated genetic variations with affective temperaments, for example, association between the 5-HTTLPR genotypes (specifically short allele) and depressive, cyclothymic, irritable and anxious temperaments has been described.[6]

Concurrent validity of TEMPS have been established with other instruments that evaluate constructs related with personality and temperament, such as Temperament and character inventory (TCI) or Neuroticism, extraversion and openness personality inventory (NEO PI).[7] However it is clear that affective temperaments it's an independent construct by itself.

English is the original language of TEMPS-A but in an exhaustive review it was described that this instrument has been validated at least in 14 languages across 15 countries. Another 5 brief versions of TEMPS-A with 39 items have been validated in the USA, Italy (3 versions), and China. Finally, a 61 items version is validated also in Italy (Elias 2017). Some where TEMPS-A 110 items has been validated includes: Spanish,[8,9] Japanese,[10] Turkish,[11] Lebanese,[12] Hungarian,[13] Italian,[14] German,[15] French[16] and Portuguese.[17]

There are 2 Spanish versions of this instrument, one of them was developed in Barcelona (Sánchez-Moreno and Cols., 2005), the second one was developed in Buenos Aires (GH Vázquez and Cols., 2007).[18,19] A systematic review found that short versions of TEMPS-A could be as useful as the original 110 items version[20] so the aim of the present study is to develop a reliable and validated brief version of the TEMPS-A in Spanish speaking population.

Methods

Measurements

The Argentinean version of TEMPS-A was taken as the basis for the development of this validation since we consider it had a closer use of language with the target population. This instrument had a process of translation and back-translation, that is, the original version was translated from English to commonly spoken Spanish of Buenos Aires by a certificated translator and then it was back-translated to English by the first author of the Argentinean validation study – G.H. Vázquez. Finally, this version was reviewed by the first author of the original instrument – H.S. Akiskal.[21]

The tested version included 110 items, the first 4 temperament subscales: depressive, cyclothymic, hyperthymic and irritable are conformed by 21 items and the last one, anxious temperament, includes 26 items. Responders are asked to mark a true or false option in each item considering if the related content accounts for its lifetime experience. A continuous score should be obtained for each subscale. Application takes about 15 min.

Participants

Sample size was established in 550, it was calculated under a 5 subjects per item criteria as suggested for the evaluation of psychometric properties of a given instrument.[22] The alpha error was established in 5% with a confidence Interval of 95% estimating a 50% of possible variation. A total of 573 students responded to the questionnaire, but 30 of them had a familiar or personal background of psychological or psychiatric attention and 3 did not answer all the items, so it was necessary to test one more group to reach the 550 sample size.

All the participants were selected by a systematic and randomized sampling method in a public university of Mexico City. Decisions of what groups of students should be tested were established in a random way by the university staff. All the participants included should

have read and signed the consent informed which had been previously reviewed by the university scientific board. Tests were performed in classrooms, students of 18 years-old or more who read and signed informed consent were included. Surveys with missing or ambiguous data were eliminated from analysis. A brief survey designed for this study asked if subjects had been on psychological or psychiatric diagnosis and/or treatment or if some of their first degree relatives also had received this kind of attention, those students who reported positive in this antecedents were excluded from analysis to avoid possible clinical population. The sample was composed of 298 (54.2%) women. The mean age was 23.3 years (SD = 6.2), 20 were married (3.6%), and 38 had permanent job (6.9%). The distribution according to different knowledge areas was: 39.6% of the participants were in humanities and social sciences, 30% biological and health sciences, 17.6% were in basic sciences and engineering and the last 12.7% in arts and design.

In order to test the external validity of Spanish Brief version of TEMPS-A it was applied to inpatients with a diagnosis of Major Depressive Disorder (MDD) at the National Institute of Psychiatry in Mexico City in a systematic non-probabilistic way. Some of these patients had a categorical anxiety diagnosis or subsyndromal anxiety symptoms, but no other comorbidity was allowed. Further, we applied the Brief version to paired controls by age and sex, these controls were asked not to have a psychiatric or psychological diagnosis nor a first degree relative who had such a diagnosis either. They belonged to the same geographical entity of the inpatients and were recruited in different places such as schools, workplaces or community centers for recreation activities and they all consented to participate in the study. We had calculated a sample size of 64 per group based on a Student t analysis, with a medium effect size (0.50) and an alpha error of 0.05, but due to time of recruiting a total of 57 patients with MDD were included of which 14% were male (8) and 86% (49) were female, with this sample size the statistical power $(1 - \beta$ error) was of 0.75. Since the matching process for age was very accurate the mean and SD were equal for MDD and Control groups resulting in 33.14 and 12.76, respectively. We did not find differences in schooling, and the median was of 12 and 16 years for TDM and Control group respectively. Regarding work, 31 of the patients had a permanent job (54.3%). Finally a total of 29 were married (50.87%).

Statistical analysis

An item analysis was performed calculating the discrimination coefficient by a Pearson correlation method between each item and the total score of related subscale. Items with $r \geq 0.20$ were included. Reliability was calculated with Cronbach coefficient score. Construct validity was evaluated using a Maximum Likelihood exploratory factorial analysis with Varimax rotation considering a 0.30 factor load as the minimum acceptable value for an item to be held. All the analysis were performed with SPSS package version 21.0.

Results

Discriminative item power

There were just 3 items that had a low discriminative power ($D < 0.20$), all of them belonging to depressive temperament subscale. We decided that these items should not be included for further analysis. No other subscale had an item with low discriminative power.

Internal consistency before factorial analysis

Cronbach Alpha coefficients were stated as follows: depressive temperament 0.70, cyclothymic temperament 0.82, hyperthymic temperament 0.71, irritable temperament 0.83 and anxious temperament 0.84.

Factor analysis

Considering the theoretical framework proposed by the original author of the instrument, a five-factor solution was attempted. Regarding this analysis a 0.769 value was observed in the Kaiser–Meyer–Olkin index and a value of 3055.992 with df = 630 and a $p < .001$ was observed

Table 1
Factorial analysis of TEMPS-A 110 items.

	Spanish brief items	Factor				
		1	2	3	4	5
D1	**I'm a sad, unhappy person**			**.456**		
D2	**People tell me I am unable to see the lighter side of things**			**.427**		
D3	**I have suffered a lot in life**			**.351**		
D5	I give up easily					
D6	**For as long as I can remember, I've felt like a failure**			**.643**		
D7	I have always blamed myself for what others might consider no big deal	.379				
D8	**I don't seem to have as much energy as other people**			**.412**		
D10	In a group, I would rather hear others talk					
D12	**I feel very uneasy meeting new people**			**.354**		
D13	My feelings are easily hurt by criticism or rejection	.308				
D14	I am the kind of person you can always depend on					
D15	I put the needs of others above my own	.306				
D16	I am a hard working person		.317			
D17	**I would rather work for someone else than be the boss**			**.449**		
D18	It is natural for me to be neat and organized					
D19	I'm the kind of person who doubts everything	.353				
D20	My sex drive has always been low					
D21	I normally need more than 9 hours of sleep					
C22	I often feel tired for no reason	.365				
C23	I get sudden shifts in mood and energy	.352				
C24	**My moods and energy are either high or low, rarely in between**				**.392**	
C25	My ability to think varies greatly from sharp to dull for no apparent reason				.361	
C26	**I can really like someone a lot, and then completely lose interest in them**				**.373**	
C27	I often blow up at people and then feel guilty about it					
C28	**I often start things and then lose interest before finishing them**				**.383**	
C29	**My mood often changes for no reason**				**.366**	
C30	I constantly switch between being lively and sluggish	.306			.315	
C31	I sometimes go to bed feeling down, but wake up in the morning feeling terrific				.360	
C32	I sometimes go to bed feeling great, and wake up in the morning feeling life is not worth living	.319		.333		
C33	I am told that I often get pessimistic about things, and forget previous happy times	.427		.393		
C34	I go back and forth between feeling overconfident and feeling unsure of myself	.436	.322			
C35	I go back and forth between being outgoing and being withdrawn from others				.316	
C36	**I feel all emotions intensely**				**.374**	
C37	My need for sleep varies a lot from just a few hours to more than 9 hours				.347	
C38	**The way I see things is sometimes vivid, but at other times lifeless**				**.432**	
C39	**I am the kind of person who can be sad and happy at the same time**				**.447**	
C40	I daydream a great deal about things that other people consider impossible to achieve					
C41	I often have a strong urge to do outrageous things				.310	
C42	I am the kind of person who falls in and out of love easily				.311	
H43	**I'm usually in an upbeat or cheerful mood**		**−.401**			
H44	**Life is a feast which I enjoy to the fullest**		**−.418**			
H45	I like telling jokes, people tell me I'm humorous					
H46	I'm the kind of person who believes everything will eventually turn out all right			−.301		
H47	I have great confidence in myself		−.315			
H48	I often get many great ideas					
H49	**I am always on the go**		**−.511**			
H50	**I can accomplish many tasks without even getting tired**		**−.421**			
H51	I have a gift for speech, convincing and inspiring to others		**−.380**			
H52	**I love to tackle new projects, even if risky**		**−.448**			
H53	**Once I decide to accomplish something, nothing can stop me**		**−.391**			
H54	**I am totally comfortable even with people I hardly know**		**−.468**			
H55	I love to be with a lot of people		**−.375**			
H56	People tell me that I often get my nose into others business					
H57	I am generous, and spend a lot of money on other people					
H58	I have abilities and expertise in many areas					
H59	I feel I have the right and privilege to do as I please					
H60	I am the kind of person who likes to be the boss					
H61	When I disagree with someone, I can get into a heated					.505
H62	My sex drive is always high					.320
H63	Normally I can get by with less than 6 h of sleep					
I64	**I am a grouchy (irritable) person**					**.362**
I65	I am by nature a dissatisfied person					.334
I66	I complain a lot					.316
I67	**I am highly critical of others**					**.371**
I68	I often feel on edge	.426				
I69	I often feel wound up	.500				
I70	I am driven by an unpleasant restlessness that I don't understand	.368				
I71	**I often get so mad that I will just trash everything**					**.374**
I72	**When crossed, I could get into a fight**					**.473**
I73	People tell me I blow up out of nowhere	.381				.343
I74	When angry, I snap at people					.317
I75	**I like to tease people, even those I hardly know**					**.392**
I76	**My biting humor has gotten me into trouble**					**.383**
I77	I can get so furious I could hurt someone					
I78	I am so jealous of my spouse (or lover), that I cannot stand it					
I79	**I am known to swear a lot**					**.404**
I80	I have been told that I become violent with just a few drinks			.383		
I81	I am a very skeptical person					
I82	I could be a revolutionary					
I83	My sex drive is often so intense that it is truly unpleasant			.358		
I84	(Women only): I have attacks of uncontrollable rage right before my periods	.355				
A85	**I have been a worrier for as long as I can remember**	**.437**				
A86	**I'm always worrying about one thing or another**	**.601**				
A87	**I keep on worrying about daily matters that others consider minor**	**.466**				
A88	**I cannot help worrying**	**.635**				
A89	**Many people have told me not to worry so much**	**.546**				
A90	When stressed, my mind often goes blank	.355				
A91	**I am unable to relax**	**.495**				
A92	**I often feel jittery inside**	**.454**				
A93	When stressed, my hands often tremble					

Table 1
(*Continued*)

Spanish brief items		Factor				
		1	2	3	4	5
A94	I often have an upset stomach					
A95	When I'm nervous, I may have diarrhea					
A96	When I'm nervous, I often feel nauseous					
A97	When I'm nervous, I have to go to the bathroom more often					
A98	When someone is late coming home, I fear they may have had an accident	.358				
A99	I am often fearful of someone in my family coming down with a serious disease	.430				
A100	I'm always thinking someone might break bad news to me about a family member					
A101	My sleep is not restful	.379				
A102	I frequently have difficulty falling asleep	.402				
A103	I am, by nature, a very cautious person					
A104	I often wake up at night afraid that burglars are in the house			.378		
A105	I easily get headaches when stressed	.413				
A106	When stressed, I get an uncomfortable feeling in my chest	.330				
A107	I'm an insecure person	.368				
A108	Even minor changes in routine stress me highly	.323				
A109	While driving, even when I haven't done anything wrong. I fear that police may stop me			.365		
A110	Sudden noises startle me easily	.361				

Bolded items were conserved for the brief version.

Table 2
Affective temperament values with reliability for students' sample.

Temperament	Mean/SD	Inside the distribution	−2 SD	+2 SD	Cronbach Alpha's
Anxious	2.60 ± 2.12	549 (99.8%)	0	1 (0.2%)	.800
Hyperthymic	4.59 ± 1.83	534 (97.1%)	16 (2.9%)	0	.690
Depressive	0.94 ± 1.20	527 (95.8%)	0	23 (4.2%)	.691
Cyclothymic	2.90 ± 2.06	550 (100%)	0	0	.781
Irritable	1.69 ± 1.66	528 (96%)	0	22 (4%)	.800

SD = standard deviation.

for Bartlett's sphericity test. These findings represent a good sample with an acceptable factorial adequacy.

Most of the items of each subscale were kept together, so we decided to take into account the first seven items with the highest factor load of the predominant subscale on each factor to obtain a practical scale in terms of application. All of these items belonged to original subscale before factorial analysis was performed (see Table 1). The factorial model explained a 25.70% of the total variance.

The total of variance explained by each resulting factor and its alpha coefficient are shown in the Appendix 1 and encompassed the recommended Spanish Brief Version of TEMPS-A.

Means scores and cut-off points

Distribution values including means and standard deviations are shown in Table 2. The cut-off points emerged from the mean scores of the 5 factors and were fixed at *SD* = 2. Considering these values the percentage of outliers subjects were as follows: 1 (0.2%) for Anxious factor, Hyperthymic 16 (2.9%), Depressive factor 23 (4.2%), Cyclothymic factor 0% and Irritable factor 22 (4%).

External validation

Anxious temperament had the highest mean in the depression group, followed by cyclothymic temperament. When comparing individuals with MDD and students, 40 (70.1%), 1 (1.75%), 40 (70.1%), 35 (61.4%) and 23 (40.3%) of the MDD group had values beyond the cut off points in anxiety, hyperthymia, depression, cyclothymia and irritability, respectively.

Control group showed the highest mean for hyperthymic temperament, followed by anxious temperament. When comparing individuals of the control group and students, 8 (14%), 7 (12.2%), 2 (3.5%), 2 (3.5%) and 1 (1.75%) had values beyond the cut off points in anxiety, hyperthymia, depression, cyclothymia and irritability, respectively (for further data on external validation see Table 3).

Discussion

Observed results on this brief version of TEMPS-A showed the adequate properties for supporting its use for Spanish speaking population for clinical or investigational scenarios. Taking into account the findings above mentioned we strongly recommend this 35 items version when lack of time for completing instruments implies an issue of concern.

This shorter version displayed a good reliability and maintained a similar balance regarding the total number or items per subscale comprehended in 110 items version and requires less time to be filled. Many short versions of TEMPS-A have been validated in different countries like Germany[23] or China,[24] and for most of the validations a five factor structure has been maintained. A systematic review found good psychometric properties of these shorter versions.[25]

The sample included for this research supposes a population sector with better resources than the national average in many respects, so it is not surprising that hyperthymic temperament had shown the highest mean since people with this affective temperament have shown good scholar achievements, followed by cyclothymic and in third place anxious temperament.[26] Depressive temperament had more outliers than the others but this can be due to a low mean for this temperament in this sample.

Sample of inpatient with major depression showed the highest mean on anxious instead of depressive temperament, however we must keep in mind that affective temperaments should be closer to a trait than to a state, so these patients could have had anxiety as a trait that predisposes them to depression. It could be useful to use a psychometric scale to control these possibilities on future studies. Cyclothymic was the second temperament in prevalence in this sample, which has been reported in other populations with major depression even of older age in case control studies.

Observed values for students and control group were similar for the most prevalent temperament, which was hyperthymic, but the second most prevalent temperament in the control group was anxious instead of cyclothymic. In general, the profile of temperaments of the control group was closer to the sample of students than inpatients with major depression sample this was expected since both groups were obtained from non clinical population. Further studies with this brief version in the clinical population are required to compare with other countries findings.

All the cronbach alpha's for the different temperaments in the students, clinical and control groups were from acceptable to good (.677–.800).

We discarded subjects with familiar or personal history of psychologic or psychiatric treatment, but we cannot completely discard that some of them will develop psychopathology later in lifetime, so it will be necessary to observe if future research with this instrument in older age population samples keep the same distribution of temperaments and a similar percentage of outliers.

One limitation for the present study was the lack of test-retest evaluation, which can always be important for instruments that measure

Table 3
Affective temperaments values of MDD and Control group with reliability and effect sizes.

Factor	Mean/SD	Inside the distribution	−2 SD	+2 SD	Cronbach alphas	ES
Major depressive disorder group						
Anxious	5.01 ± 1.89	55 (96.5%)	6 (10.5%)	0	.791	−1.26
Hyperthymic	2.26 ± 2.03	56 (98.2%)	0	1 (1.8%)	.677	.84
Depressive	3.57 ± 2.03	57 (100%)	0	0	.741	−1.38
Cyclothymic	4.63 ± 1.83	56 (98.2%)	1 (1.8%)	0	.751	−1.35
Irritable	2.91 ± 2.11	57 (100%)	0	0	.725	−0.90
Control group						
Anxious	2.01 ± 1.74	55 (96.5%)	0	2 (3.5%)	.785	
Hyperthymic	4.14 ± 2.00	55 (96.5%)	2 (3.5%)	0	.699	
Depressive	0.62 ± 0.82	55 (96.5%)	0	2 (3.5%)	.701	
Cyclothymic	1.66 ± 0.13	55 (96.5%)	0	2 (3.5%)	.730	
Irritable	1.14 ± 1.23	53 (93%)	0	4 (7.0%)	.710	

SD = standard deviation, ES = effect sizes of estimated differences between means of MDD and control group, according to Cohen's *d*.

characteristics that are supposed to be stable over time. Although affective temperaments construct is different to other temperament and personality constructs, it would be desirable to make comparisons with other instruments to test convergent validity, a point that was not considered for this study. Another limitation was the mean age of the principal sample (students).

Conclusions

A Spanish brief version of 35 items of TEMPS-A with five factors and a theoretical respected structure was obtained in a Mexican student's population with good reliability and good external validity in older clinical population.

Funding

Conflict of interest

Authors declare no conflict of interest which could interfere with the content of the paper.

Acknowledgement

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.rpsm.2021.08.002.

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