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Measuring anankastic personality traits

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Introduction. The authors validate a 20 item scale designed to measure anankastic (obsessive) personality traits: the Mini-Inventory of Anankastic Personality Traits 2nd version (MIAPT-2).

Material and methods. The answers of a sample of 418 subject of both genders obtained from the general population were used to analyze construct validity (factorial analysis), its alpha reliability and its internal consistency through the item/total correlations and the two halves test. An additional sample of 22 medical students was used to analyze the concurrent validity of the scale (external criterion: the Maudsley Obsessional-Compulsive Inventory) and the temporary reliability with the test-retest method. After this, the total scores of the instrument and the factorial scores were standardized and distributed into percentiles.

Results. The scale shows good concurrent validity ($r = 0.67$; $p < 0.000$) and construct validity (56% of the total of the variance explained by the Factorial analysis) as well as a good internal consistency through the item/total correlations (all $p = 0.000$) and two halves test ($r = 0.71$; $p < 0.000$; with the Spearman-Brown correction $R = 0.83$). The alpha reliability of the scale ($\alpha = 0.84$), and the test-retest ($r = 0.69$; $p < 0.000$) are high.

Conclusions. The validated MIAPT-2 shows good validity and reliability to evaluate anankastic personality traits. The authors include an appendix with the scale and the standardization of its total and factorial scores distributed into percentiles to be used in clinical and general population samples.

Key words:
Obsessive traits. Personality. Measure. Evaluation. Realibility. Validity. Standardization.

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Evaluando los rasgos anacásticos de la personalidad

Introducción. Los autores validan una escala de 20 ítems diseñada para medir rasgos anancásticos de la personalidad: el Mini-Inventario de Rasgos Anancásticos de la Personalidad segunda versión (MIRAP-2).

Material y métodos. Utilizan las respuestas de una muestra de 418 sujetos de ambos sexos extraídos de la población general para analizar la validez de constructo (análisis factorial), su fiabilidad alfa y su consistencia interna mediante la correlación ítem/total y prueba de las dos mitades. Se utiliza una muestra adicional de 22 estudiantes de medicina para analizar la validez concurrente de la escala (criterio externo: el *Maudsley Obsessional-Compulsive Inventory*) y la fiabilidad temporal mediante la prueba test-retest. Tras ello se procede a estandarizar las puntuaciones totales del instrumento y las puntuaciones factoriales, distribuyéndolas en percentiles.

Resultados. La escala muestra una buena validez concurrente ($r = 0{,}67$; $p < 0{,}000$) y validez de constructo (56% del total de la varianza explicada por el análisis factorial), así como una buena consistencia interna mediante las correlaciones ítem/total (todas $p = 0{,}000$) y prueba de las dos mitades ($r = 0{,}71$; $p < 0{,}000$; con la corrección de Spearman-Brown $R = 0{,}83$). La fiabilidad alfa de la escala es elevada ($\alpha = 0{,}84$), así como lo es la prueba test-retest ($r = 0{,}69$; $p < 0{,}000$).

Conclusiones. La escala validada muestra una buena validez y fiabilidad para evaluar los rasgos anacásticos de la personalidad. Los autores incluyen un apéndice con la escala y la estandarización de sus puntuaciones totales y factoriales distribuidas en percentiles para su uso en muestras tanto clínicas como de la población general.

Palabras clave:
Rasgos anancásticos. Obsesivos. Personalidad. Medida. Evaluación. Fiabilidad. Validez. Estandarización.

INTRODUCTION

Personality affects the way of confronting life and the way of becoming ill and even of responding to treatment[1-3].

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For some time, it has been indicated that anankastic personality traits shape an important proportion of the total variance that makes up the overall constellation identified as pre-depressive or melancholic personality[4]. Equally, its participation in partner selection is known[5].

Thus, measuring the anankastic personality traits and being able to express them quantifiably is an objective that would make it possible to better investigate and know its potential influence in different clinical aspects of humans developing a condition.

In 1983, the first author designed an instrument of this nature, the Mini-Inventory of Anankastic Personality Traits (MIAPT)[6]. The main objective of that investigation was to develop a valid and reliable scale, which was also short and easy to administer. The results obtained reflected that that instrument was acceptably valid (construct, convergent and predictive validity) and reliability (alpha, test-retest test and that of two halves)[6,7].

This present investigation aimed to improve the competence of the MIAPT, maintaining its shortness and ease of administration and to analyze its validity and reliability again. It also aimed to standardize its scores in a new sample that was larger than the original one, completely obtained from the general population.

MATERIAL AND METHODS

Instrument

The MIAPT-2 is made up of twenty questions (the 17 original ones plus 3 added afterwards) related with the presence of anankastic personality traits (see appendix). Such items summarize the clinical experience of most of the psychiatrists in their daily evaluating tasks on this subject. Each question has four response levels: always, often, rarely and never. These time adverbs are equivalent to the quantifying adverbs: extremely, enough, mildly, whose semantic distance in several languages, including Spanish, is known (0.5 points)[8,9]. Each adverb has an assigned value (respectively: 3, 2, 1, 0) that makes it possible to use parametric statistics for its analysis.

Subjects

A total sample of 418 subjects obtained from the general population of Majadahonda (Madrid), a population chosen due to the strategic facilities offered to the investigators, was used.

The Spanish Mail Agency distributed 5000 questionnaires, randomly, in each mailbox of the population of that site (which included the present version of MIAPT-2 and the response instructions) during normal mail delivery. A period of one week was given to send the answers, in a prepaid envelope, and 429 (9 %) answers were obtained.

Distribution by genders of the persons who responded was 190 (46 %) men and 228 (54 %) women, with a mean age of 47 and 39 years respectively. Distribution by professions of this sample was, among the women: 3.5 % skilled worker, 7.9 % student, 14 % liberal profession, 20.2 % self-employed businesswoman, 21.5 % housewife, 32.9 % state worker or non-directive employee; and among the men: 0.5 % «househusband», 4.5 % student, 5.1 % skilled worker, 21.7 % state worker or non-directive employee, 24.2 % liberal profession and 43.9 % self-employed businessman. This sample has already been described elsewhere[10].

Statistical analyses of the data

A total of 418 questionnaires that were correctly filled-out were used for the statistical analysis. The others had unresponded items, thus invalidating them for the calculations desired in the present investigation.

An additional sample of 22 5th year medical students who volunteered during a psychiatry course class given by the first author was used to study the concurrent validity. They filled out the MIAPT-2 and the Maudsley Obsessional-Compulsive Inventory (MOCI)[11], whose Spanish translation had already been used for these objectives in 1983[6].

The construct validity of the new version of the scale (MIAPT-2) and the analysis of the conceptual dimensions it contains was calculated with a factorial analysis by the main components procedures plus a varimax rotation. The extraction of the factors was discontinued when the characteristic roots began to be inferior to the unit. Using the Kaiser-Meyer-Olkin and Bartlett tests, it was confirmed that the interitem correlations were elevated and the sphericity of the correlation matrix was verified[12].

Reliability was calculated by two homogeneity tests: item/total correlation and correlation of the two halves formed by the scores obtained by odd items on the one hand and the even items on the other, applying Spearman-Brown's correction. For the test-retest reliability, the sample of 22 medical students previously mentioned was used. They responded to the MIAPT-2 one week after they had filled it our for the first time. Reliability of the MIAPT-2 was also calculated with Cronbach's alpha intraclass correlation coefficient[13].

The goodness of fit of the MIAPT-2 scores was verified by the Kolmogorow-Smirnow test to observe that its scores were normally distributed. After this, standardization of the scores was obtained, transforming them into z scores (that assumes a mean value of 0 and a standard deviation of 1) and their equivalent distribution in percentiles[14].

In general lines, except when stated to the contrary, the correlations were always calculated with Pearson's r, and

Appendix | **The Mini-Inventory of Anankastic Personality Traits, version 2 (MIRAP-2)**

Instructions

We present a list of questions whose objective is to know some aspects of your personality. None of the questions are deceiving or have a double meaning, or correct or incorrect answers. Please answer sincerely to the questions, making a circle (o) around the number of the response that best defines your way of being.

It will help us to understand you better.

		Always	Often	Rarely	Never
1.	Do you use more time than necessary to do things, only to convince yourself they are completely finished?	3	2	1	0
2.	Are you systematic and methodical in your life?	3	2	1	0
3.	Do you strictly keep time schedules, habits and rules in your daily work?	3	2	1	0
4.	Do you always need to follow a certain order to get dressed, undressed or wash, feeling uncomfortable if something prevents it?	3	2	1	0
5.	Do you feel you fail when you try to explain things in spite of having planned what you were going to say beforehand?	3	2	1	0
6.	Do you go around in circles before doing them?	3	2	1	0
7.	Do you ask many questions about whether you have acted correctly or incorrectly after doing things?	3	2	1	0
8.	Do you like to do things exactly, up to the smallest detail?	3	2	1	0
9.	Even when you have done something very carefully, do you have doubts whether something that is not well done remains?	3	2	1	0
10.	Do you feel uncomfortable if you do not do things in the planned time or in a certain order?	3	2	1	0
11.	Do you need to check if you have turned off the water, gas, lights, doors, etc., several times to be completely sure you have done so?	3	2	1	0
12.	Do you organize your personal objects; always in the same places?	3	2	1	0
13.	Are you very careful to fold and put your clothes away at night?	3	2	1	0
14.	Are you very demanding about keeping your hands clean at all times?	3	2	1	0
15.	Do you usually clean the silverware with a napkin before using them when you are away from home?	3	2	1	0
16.	Are you very demanding and strict with yourself?	3	2	1	0
17.	Do you get angry or irritated (interiorly) if people do not do things correctly or on time?	3	2	1	0
18.	Do you tend to take on more work and responsibilities than really correspond to you?	3	2	1	0
19.	Do you feel uncomfortable if someone makes a change in the order of your things?	3	2	1	0
20.	Is it generally difficult for you to adapt to changes, to new situations?	3	2	1	0

the contrast of means by ANOVA. All the differences have been considered statistically significant after $p < 0.05$.

RESULTS

The concurrent validity of the MIAPT-2 is sufficient, as already occurred with its initial version6. The correlation between its total score and that of the MOCI is elevated and very significant ($r = 0.67$; $p < 0.000$). It is not surprising that the correlation is not higher because the concepts measured by both instruments are not totally the same: anankastic traits by the MIAPT-2 and obsessive-compulsive ones by the MOCI. In spite of this, the association that both instruments show is of interest.

Equally interesting results are provided by the construct validity of the MIAPT-2, evidenced by the factorial analysis (table 1). The MIAPT-2 items are grouped around five factors (one less than its initial version)[6]. They account for 56 % of the total of the variance obtained (indicator of the construct validity). This is a construct validity that maintains the discretion level that most of these types of tests generally have. However, it may be considered sufficient as it explains more

Table 1 Factorial analysis (main components plus varimax rotation) and construct validity of each item and the total score of the MIAPT-2

Item No.	Question of the MIAPT-2	I Order	II Doubt	III Responsability	IV Rejection of change	V Scrupulosity	h^2 (construct validity)
1	Do you use more time...?	0.21	**0.64**	-0.13	-0.03	0.22	0.51
2	Are you systematic...?	**0.75**	-0.00	0.14	0.00	0.06	0.59
3	Do you strictly keep...?	**0.68**	-0.04	0.18	-0.06	-0.04	0.50
4	Do you need to follow...?	0.62	0.22	0.04	**0.33**	**-0.04**	0.54
5	Do you feel you fail...?	-0.05	**0.49**	0.04	**0.34**	-0.05	0.36
6	Do you go around in circles...?	**0.31**	**0.68**	0.01	0.00	0.05	0.57
7	Do you ask many questions...?	0.10	**0.70**	0.20	0.17	-0.06	0.57
8	Do you like to do things...?	**0.46**	**0.35**	**0.50**	-0.20	0.10	0.63
9	Even when you have done...?	-0.04	**0.74**	0.14	0.18	0.10	0.61
10	Do you feel uncomfortable if you do not...?	**0.39**	**0.31**	**0.40**	**0.40**	-0.10	0.57
11	Do you need to check...?	0.08	**0.42**	0.07	**0.33**	**0.43**	0.48
12	Do you organize...?	**0.73**	0.02	0.03	0.27	0.12	0.62
13	Are you very careful to...?	**0.70**	0.10	-0.03	0.04	**0.30**	0.60
14	Are you very demanding...?	**0.35**	0.20	0.12	-0.24	**0.41**	0.40
15	Do you usually clean the...?	0.07	0.02	0.06	0.02	**0.83**	0.70
16	Are you very demanding...?	0.25	0.16	**0.67**	-0.04	0.13	0.55
17	Do you get angry or irritated...?	0.04	0.02	**0.48**	**0.45**	**0.36**	0.57
18	Do you tend to take on more work...?	0.01	-0.03	**0.77**	0.06	-0.02	0.59
19	Do you feel umconfortable if someone...?	**0.36**	0.14	0.24	**0.63**	0.11	0.61
20	Is it generally difficult for you...?	0.03	0.26	-0.15	**0.69**	-0.05	0.58
	Characteristics roots	3.28	2.75	1.90	1.80	1.40	
(%)	Total variance explained	16.41	13.72	9.49	9.01	7.01	**55.64**
(%)	Accumulated variance explained	16.41	30.13	39.63	48.63	55.64	

The items that most contribute to the factor are in **bold** (≥ 0.30).

than 50 % of the whole of the total variance obtained by the factorial analysis[15]. What is new is that this second version of the MIAPT has an apparently lower construct validity than its original version (69 %)[6]. This difference should be carefully assessed since the factorial analysis of the first MIAPT was conducted on the responses of 44 subjects and of the MIAPT-2 on 418. Although the statisticians and clinicians never agree on the sample size that should be used to consider a factorial analysis sufficiently explanatory, there is a tacit agreement that it should not be less than n = 100. That is why we should consider the construct validity of the MIAPT found here more than that of the analysis conducted in 1983.

The communality (h^2) or construct validity is inferior to 50 % in three of the twenty items of the MIAPT-2 (15 %), although item 11 is on the borderline of this percentage. Individually, this seems to indicate that most (85 %) of the questions making up the MIAPT-2 are reasonably well constructed, that is, they measure a good proportion of what should be measured in principle.

Considering the saturation grade of the items in each factor, several differentiated subjects that make up the «anankasm» concept measured by the MIAPT-2 can be identified. Thus, factors I, II, III, IV and V would correspond, respectively, with the dimensions: order, doubts, responsibility, rejection of change and scrupulosity. The first two dimensions, order and doubt, account for more than half (54 %) of all the common total variance explained by the MIAPT-2, or stated in another way, of a good part of this need for control that is characterized by the conceptual construct «anankasms».

Half of the MIAPT-2 items contribute to a single factor and the rest provide a weight worthy of being considered in more than one of the dimensions found by the factorial analysis (table 1).

Reliability of the MIAPT-2 is high with any of the procedures used for its analysis (table 2). Considering the total score as representative of the construct «anankasms», it is found that each item of the MIAPT-2 highly and signifi-

Table 2 Reliability of each item of the MIAPT-2

Question of the MIAPT-2	r Item/total*	r^2 Item/total	Cronbach's α
1. Do you use more time...?	0.48	0.23	0.83
2. Are you systematic...?	0.53	0.28	0.85
3. Do you strictly keep...?	0.44	0.19	0.81
4. Do you need to follow...?	0.62	0.38	0.87
5. Do you feel you fail...?	0.36	0.13	0.77
6. Do you go around in circles...?	0.57	0.32	0.86
7. Do you ask many questions...?	0.43	0.18	0.82
8. Do you like to do things...?	0.60	0.36	0.88
9. Even when you have done...?	0.50	0.25	0.84
10. Do you feel uncomfortable if you do not...?	0.64	0.41	0.89
11. Do you need to check...?	0.53	0.28	0.85
12. Do you organize...?	0.60	0.36	0.87
13. Are you very careful to...?	0.59	0.35	0.86
14. Are you very demanding...?	0.41	0.17	0.80
15. Do you usually clean the...?	0.33	0.11	0.73
16. Are you very demanding...?	0.49	0.24	0.84
17. Do you get angry or irritated...?	0.44	0.19	0.81
18. Do you tend to take on more work ...?	0.29	0.08	0.73
19. Do you feel uncomfortable if someone...?	0.61	0.37	0.88
20. Is it generally difficult for you...?	0.34	0.12	0.77
Total scale	1.00	1.00	0.84

*All p = 0.000.

cantly correlates with it. This reflects an acceptable inner consistency of the test. When these correlation coefficients are elevated to the square, they are transformed into determination coefficients that reflect the percentage of variance that the correlated elements share. Each one of seven of the MIAPT-2 items (questions 4, 6, 8, 10, 12, 13 and 19) share more than one third of their variance with the total score, that is, with the global concept of «anankasms» represented by the latter. The rest share lower, although not significant, proportions of variance, except item 18 «Do you tend to take on more work and responsibility than really corresponds to you?» (one of those added to the original MIAPT) that only shares 8 % of its variance with the total score.

Reliability, following the two halves procedure, is also elevated for the MIAPT-2, since the combinations formed by the even and odd items have a very high and significant correlation ($r = 0.71$; $p < 0.000$), which, when the Spearman-Brown's correction is used, provides a reliability coefficient whose value is very acceptable ($R = 0.83$). In the same way, the test-retest also provides an elevated test-retest reliability ($r = 0.69$; $p < 0.000$).

In any event, the most powerful reliability indicator is Cronbach's alpha coefficient[13] because it effectively substitutes other procedures such as that of the two halves, the parallel test (convergent validity) and the test-retest ones, for the reasons given by Carmines and Seller[16]. Its under-evaluative characteristics should not be forgotten[14]. That is, it always provides reliability estimations that are below the true ones. This means that if the alpha found is high, it is sure that the reliability of the test is also high. In this sense, the whole of the MIAPT-2 has a significant alpha ($\alpha = 0.84$), which, in any case, is superior to its initial version ($\alpha = 0.78$)[6]. Table 2 also shows the individual reliability of each one of the MIAPT-2 items, equally elevated in every case. Most of the items have an alpha reliability above 0.80. It is somewhat lower in items 5, 15, 18 and 20 than in the rest, although they are above the 0.70 value, after which the instruments are considered sufficiently reliable or sure[17,18].

CONCLUSIONS

Based on the results obtained, it does not seem to be excessive to state that the MIAPT-2 is a reasonably valid and reliable instrument that may be used with confidence when evaluating anankastic personality traits. This is seen both by its construct validity (0.56) and its alpha reliability (0.84).

It is not easy to draw certainty conclusions on the effect that adding three items to the original version of the scale had on its validity due to the methodology problem previously mentioned. What does seem certain is that that added has noticeably increased its reliability as it went from an $\alpha = 0.78$ to an $\alpha = 0.84$. Given that this means that the instrument's variance of error has been reduced, our way of developing this new MIAPT version seems to be justified.

However, having validated and standardized the total and factorial scores of the MIAPT-2 also justifies this investigation, since there is now sufficient information to conduct measurable studies on the «anankasm» concept, as evaluated by this instrument. The information that the MIAPT-2 can supply is not only quantitative (its total score) and ordinal (the individual positioning regarding the general population that supplies the distribution in percentiles of this total score), but also qualitative as it is possible to apply the factorial scores extracted from such a large general population sample and to thus know the anankastic dimensions that prevail in each individual.

Such possibilities leave many possibilities open to the clinical aspect and to the investigator, as we will be able to demonstrate in a subsequent publication.

The construct validity of the MIAPT-2 may be considered legitimately satisfactory because the proportion of the va-

riance explained by the factorial analysis (56 %) exceeds the 50 % limit. After this point, it can be considered that it suggests sufficient explanatory capacity15. It is not only important that solutions rarely exceed 50 % in these types of instruments and our does, but also that the value obtained is significantly greater to that of other known and used scales such as the Cloninger Novelty Seeking Scale (22 %)[19] or the Zuckerman Sensation Seeking Scale (31 %-33 %)[20].

Although the most powerful statistical procedure to study construct validity of an instrument is the factorial analysis[14], the use of the convergent procedure is methodologically adequate to evaluate this validity. After all, the fact that a new instrument correlates well with another already established one that evaluates the same thing or something similar serves to know if the form measures what it aims to measure, which continues to be a construct validity concept. In this sense, it may be considered that the concurrent validity of the MIAPT-2 is sufficient

Table 3 **Standardization of total and factorial scores of the MIAPT-2**

N:	418	418	418	418	418	418
Mean:	32.81	0.00	0.00	0.00	0.00	0.00
σ:	8.27	1.00	1.00	1.00	1.00	1.00
Min.:	10.00	−3.17	−2.61	−3.98	−3.01	−2.26
Max.:	55.00	2.22	3.63	2.70	3.69	3.74
Percentiles	Total score	I Order	II Doubt	III Responsability	IV Rejection of change	V Scrupulosity
5	20	−1.91	−1.47	−1.52	−1.61	−1.26
10	23	−1.37	−1.24	−1.19	−1.20	−1.11
15	25	−1.09	−0.98	−0.98	−1.00	−0.96
20	26	−0.97	−0.83	−0.79	−0.82	−0.81
25	27	−0.65	−0.69	−0.65	−0.68	−0.71
30	28	−0.47	−0.57	−0.50	−0.53	−0.59
35	29	−0.29	−0.46	−0.37	−0.39	−0.51
40	30	−0.14	−0.34	−0.27	−0.25	−0.38
45	31	−0.04	−0.20	−0.15	−0.13	−0.30
50	32	0.08	−0.01	−0.04	0.01	−0.19
55	33	0.24	0.11	0.09	0.11	−0.05
60	34	0.34	0.25	0.19	0.20	0.14
65	36	0.47	0.38	0.33	0.30	0.25
70	37	0.57	0.49	0.51	0.46	0.41
75	39	0.72	0.63	0.63	0.62	0.52
80	40	0.88	0.77	0.86	0.81	0.71
85	42	1.07	0.98	1.08	0.98	0.98
90	44	1.27	1.31	1.33	1.14	1.28
95	47	1.50	1.75	1.57	1.71	2.11

σ: standard deviation.

($r = 0.67$; $p < 0.000$), as has already occurred with its initial version[6]. However, as has been mentioned in the Results and is repeated here, this information should be carefully considered given that the concepts measured by the two correlated instruments are not entirely the same (anankastic traits of the MIAPT-2 and obsessive-compulsive traits of the MOCI). Thus, this is one of the possible limitations to consider in this investigation. Subsequent correlational investigations with other instruments that evaluate more similar concepts will better delimit the true limits imposed by this fact.

Another limitation comes from the conceptualization of the personality strictly speaking. This is one problem that not only has not been solved as of yet by the present classification systems[21], but also that, if that weren't enough, these systems generate more problems than solutions, due to their more than questionable validity[22]. A good test of this is the countless comorbidities that appear in the epidemiological studies after their use[22,23]. This is because very similar items supply data to different diagnostic criteria, so that their presence adds diagnostic elements to different personality disorder criteria. Thus, although the content of the MIAPT-2 items seems to reflect specifically anankastic personality traits, it cannot be ruled out that they also evaluate other more general, and even specific, traits of different personality disorders as understood at present. However, this is a question that this present study cannot answer. A greater investigation effort must be made to establish these limits and also verify the behavior of the MIAPT-2 in clinical samples.

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