

## FACTOR STRUCTURE OF THE SYMPTOM ASSESSMENT-45 QUESTIONNAIRE (SA-45)

## ESTRUCTURA INTERNA DEL SYMPTOM ASSESSMENT-45 QUESTIONNAIRE (SA-45)

FRANCISCO PABLO HOLGADO-TELLO<sup>1</sup>,  
ENRIQUE VILA-ABAD<sup>1</sup>, AND M<sup>ª</sup> ISABEL BARBERO-GARCIA<sup>1</sup>

Cómo referenciar este artículo/How to reference this article:

Holgado-Tello, F. P., Vila-Abad, E., & Barbero-García, M. I. (2019). Factor Structure of the Symptom Assessment-45 Questionnaire (SA-45) [Estructura interna del Factor Structure of the Symptom Assessment-45 Questionnaire (SA-45)]. *Acción Psicológica*, 16(1), 31–42. <https://doi.org/10.5944/ap.16.1.22048>

### Abstract

We describe the internal structure of the Symptom Assessment-45 Questionnaire (SA-45; Davison et al., 1997) in a sample of non-clinical Spanish subjects. The scale was developed for treatment outcome assessment in psychiatric settings; however, many studies have examined its psychometric properties in non-clinical populations. The internal structure of these studies usually replicates the dimensionality proposed in the original study closely. In this work, the scale was administered to

a sample of 823 participants. In order to analyse the dimensionality of the instrument in a non-clinical population, exploratory and confirmatory factor analyses using polychoric correlations were carried out. The results obtained, are similar to those obtained for the original model and replicated in later studies, but there are important nuances that should be taken into account in defining a measurement model for the sample used. These data confirm the need for further research in a non-clinical population.

**Keywords:** SA-45; non-clinical population; internal structure; factor analysis.

**Correspondence address [Dirección para correspondencia]:** Francisco Pablo Holgado Tello. Universidad Nacional de Educación a Distancia (UNED), Spain. **Email:** [pfholgado@psi.uned.es](mailto:pfholgado@psi.uned.es)

**ORCID:** Francisco Pablo Holgado Tello (<http://orcid.org/0000-0003-0769-5901>) y Enrique Vila Abad (<http://orcid.org/0000-0003-0176-0100>).

<sup>1</sup>Universidad Nacional de Educación a Distancia (UNED), España

Retrieved: May 11 2018.

Accepted: November 12 2018.

## Resumen

Se describe la estructura interna del Symptom Assessment-45 Questionnaire (SA-45; Davison et al., 1997) en una muestra española no clínica. La escala, fue desarrollada para la evaluación de los tratamientos en entornos psiquiátricos. Sin embargo, muchos estudios han examinado sus propiedades psicométricas en población no clínica. La estructura interna en estos estudios, usualmente replica la dimensionalidad propuesta en el estudio original. En este trabajo, la escala fue administrada a una muestra de 823 participantes. Para analizar su dimensionalidad en población no clínica, se usó Análisis Factorial Exploratorio y Confirmatorio factorizando la matriz de correlaciones policóricas. Los resultados obtenidos, son similares a los del modelo original y replicados en algunos estudios, sin embargo, hay importantes matices que deben ser tenidos en cuenta para definir el modelo en la muestra usada. Los resultados, confirman la necesidad de más investigación en población no clínica.

**Palabras clave:** SA-45; población no clínica; estructura interna; análisis factorial.

## Introduction

As indicated by Fernández-Montalvo and Echeburúa (2006), it is increasingly difficult to find so-called “pure” clinical cases, i.e., patients who are afflicted by only one psychopathological disorder, as new research is showing that there is comorbidity between the different disorders. This fact implies a new approach to the evaluation and explanation of such disorders, and, consequently, the need to analyse and adapt the tools used for evaluating and explaining them. It further indicates the need for the creation of new tools that enable the gathering of more accurate information about the patient’s disorders and its possible treatment.

Despite the fact that numerous measures have been developed to evaluate personality disorders in recent years, and against the opinions of some authors (Dutton, 2003; Gondolf, 2003, among others), self-report methods

(questionnaires, inventories, scales) remain the most commonly used measurement tools. These methods can produce skewed results because of the ease of manipulating, simulating or even hiding symptoms. Because of this, the reliability of the results and the validity of any inferences made are subject to serious questioning (Calcedo, 2000; Echeburúa, Amor, & Corral, 2003).

On the other hand, the results obtained from different measurement instruments used in the diagnosis of these types of disorders often show low levels of agreement, which means that inferences and conclusions drawn from these data are also questionable (Hyler et al., 1989; Zimmerman & Coryell, 1990). In any case, a clinical diagnosis must be based on information obtained by various means: self-reporting, interviews, etc.

In the field of psychopathology, self-reporting has been used for both the evaluation of specific disorders (Fernández-Montalvo & Echeburúa, 2006) and the exploration of symptomatology, being it general or specific to an individual. One of the self-reporting methods most commonly used for the latter is the SCL-90 (Derogatis, 1977; Derogatis & Cleary, 1977; Derogatis, Lipman, & Covi, 1973), composed of 90 items across nine different scales that seek to measure nine basic dimensions: somatisation, obsessive compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. Derogatis and Savitz (1999) developed an updated version of the scale (SCL-90-R) 90-item, multidimensional self-report symptom inventory which measures symptomatic psychological distress. The SCL-90-R results in three global measures of distress as well as the nine primary symptom dimensions defined before and did not represent a significant change respect to the SCL-90 since only two items were modified. However, the SCL-90 as well as the updated version, presents a few problems that complicate its use: the large number of items, the overlap in items, the high correlation among the nine scales, the low degree of discriminant validity, the instability of its structure, and the lack of factorial validity, indicated by the fact that factorial structures that varied from one to ten factors were proposed in various studies of the questionnaire (Davison et al., 1997; Sandín et al., 2008; Vassend & Skrandal, 1999). In order to avoid some of these inconveniences,

Davison et al. (1997) developed a questionnaire, the Symptom Assessment-45 Questionnaire (SA-45), that (a) maintained the advantages of the SCL-90; (b) required only half the number of items used in the SCL-90 (45 items); (c) contained the same number of items for each scale, in order to retain their reliability; and (d) avoided item overlap, thus minimising correlations among the different scales by increasing its discriminant validity and favouring the utility and usability of the instrument. This last improvement is especially important given the existing efforts to integrate the treatment of behavioural problems into primary care services, in order to offer more efficient and effective service to individuals with psychological and emotional problems.

Maruish, Bershady, & Goldstein (1998) carried out a project designed to demonstrate the benefits of integrating behavioral healthcare services in primary medical care settings providing an opportunity to further investigate the psychometric properties of the SA45 using data from a sample of 126 adults. Specifically, the appropriateness of the SA45's adult nonpatient norms, as well as cross-validation of its test-retest reliability and construct validity, was investigated. The results suggested that use of the SA45 nonpatient norms with primary care populations is appropriate. The use of the SA-45 has demonstrated its utility in (a) identifying and classifying psychiatric patients, although accurate classification of patients requires further evaluation for behavioral health problems, (b) evaluating psychopathological changes in patients with health problems, and (c) highlighting the effects of psychological treatment in psychiatric patients.

The psychometric properties of the Spanish version of the SA-45 have been studied by Sandín et al. (2008) using a sample of 420 students from various public universities in Madrid. The main objective of his work was the study of the factorial structure of the questionnaire through the implementation of a series of factor analyses, both exploratory and confirmatory. The results of the exploratory factor analyses suggest a factorial structure of nine factors, which was later corroborated through a confirmatory factor analysis. A similar study was carried out by Alvarado, Sandín, Valdez-Medina, González-Arraia, & Rivera (2012) using a sample of 418 university students from the Universidad Autónoma del Estado de México. The results

showed that the psychometric characteristics of the questionnaire were very similar even when dealing with samples from diverse cultural backgrounds. However, factorial solutions are difficult to replicate, even under exceptionally favourable circumstances as the exploratory factor analysis is sensitive to the characteristics and size of the sample group used (Costello & Osborne, 2005; Osborne, Costello, & Kellow, 2008; Osborne & Fitzpatrick, 2012).

As the study by Sandín et al. (2008) was the first study in which the Spanish version of the SA-45 was validated psychometrically, we have deemed it beneficial to carry out a new study. The main objectives of this new study are to analyse the internal structure of SA-45 and to evaluate its reliability in a non-clinical sample.

## Method

### *Participants*

The sample was composed of 823 university students from the National University of Distance Education of Spain, with 21.8 % of the sample being male and 78.2 % being female. The differences in percentage between male and female subjects can be explained by the fact that the sampling was incidental and it is the nature of the population of students in this university. The average age in the group was 36.8 (SD = 10.1), with an average of 38.9 (SD = 10.7) for males and 36.2 (SD = 9.9) for females. Participants ranged from 19 to 52 years of age. However, this age and gender differences between the two groups was not statistically significant. All participants were informed of the nature and purpose of the experiment and all gave their written informed consent.

### *Measures*

The Spanish version of the SA-45 (Symptom Assessment-45 Questionnaire; Davison et al., 1997), created by Sandín et al. (2008), was used in this study. It is a questionnaire comprising 45 items on a five-level Likert scale with items ranging from 0 ("Not at all") to 4 ("Very much so, or extremely"). The questionnaire derives from the

original Symptom Checklist-90 (SCL-90; Derogatis, Lipman, & Covi, 1973) and seeks to evaluate the following dimensions: somatisation, obsessive compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism.

The questionnaire was developed, primarily, as a tool to evaluate the results obtained from different treatments applied to psychiatric patients (Davison et al., 1997), but studies are being carried out with non-clinical sample groups as a means of determining the questionnaire's potential usefulness in detecting the level of overall mental health of participants and/or the presence of any indication of psychological pathology or maladjustment. The questionnaire was implemented and answered on-line.

### *Procedure*

Participants were recruited through a personal e-mail addressed sent to students enrolled in various courses taught. They were informed that their participation would be voluntary and anonymous and would consist of filling out a questionnaire posted on a website accessed with a username and password, both of which could be verified as authentic by the university system.

### *Statistical analysis*

Firstly, the analyses carried out focused on the subjects' responses to each item and the distribution of these responses across the different categories. Secondly, different factor analyses were carried out in two sub-samples, both exploratory (N = 413) and confirmatory (N = 410), to analyse which factorial structure presented the best goodness of fit. Thirdly, the reliability of the questionnaire was analysed using Cronbach's coefficient alpha, both at a global level and at the levels of each of the postulated scales.

Given the characteristic of the data, that is ordinal variables, we decided to use minimum unweighted least square and promax rotation, with polychoric correlation as they are considered to be the most adequate procedure (Barense, Oort, & Timmerman, 2015). In the same sense, in order to take into account the nature of the data, and

prevent the assumptions' violation of the Confirmatory Factor Analysis, we used unweighted least square as estimation method (Jöreskog & Sörbom, 1989; Holgado-Tello, Chacón, Barbero, & Vila, 2010; Holgado-Tello, Morata-Ramírez, & Barbero, 2018; Morata-Ramírez, Holgado-Tello, Barbero-García, & Méndez, 2015; Yang-Wallentin, Jöreskog & Luo, 2010). The analyses were carried out using SPSS (version 15) and LISREL (version 8.8).

## **Results**

### *Analysis of the responses*

The distributions obtained for each of the items highlighted their skewness and lack of variability. The mode for all the items fell on 0 (the category "Not at all"). The median also fell on 0 for all items except numbers 5, 10, 12 and 18, where it fell on "Somewhat present". The means oscillated between 0.03 and 0.96 and the standard deviations were between 0.22 and 1.07.

For many of the items, over 90 % of the responses fall into the "Not at all" category, and for many of the statements, none of the respondents selected the last two categories. The skewness of the responses, as well as the lack of discrimination of the statements, will affect the results of later analyses.

### *Exploratory factor analysis of S-45*

The Kaiser-Meyer-Olkin test (= 0.923) and Bartlett's sphericity test ( $\chi^2(990) = 9389.152$ ,  $p = 0.000$ ) highlighted the suitability of the data for factor analysis.

The results obtained seem to confirm a factorial structure of nine factors that explain 62.82% of the variance. However, the first factor itself accounts for 32.87 % of the variance; the next factor accounting for just 5.86 %. The eigenvalues obtained from the nine factors were as follows (in parentheses after each figure is the variance percentage explained by the corresponding eigenvalue): 14.79 (32.87 %); 2.64 (5.86 %); 2.25 (5.01 %); 2.02 (4.49 %);

Table 1.

Factorial structure. Extraction method: minimum unweighted least square. Rotation: promax. loadings over 0.5.

Items	F 1	F 2	F 3	F 4	F 5	F 6	F 7	F 8	F 9	Scale
14	.794			.571	.667		.576	.538		IS
44	.757									PI
15	.697				.621					IS
19	.662									PI
40	.658									PI
27	.620							.562		DE
11	.608				.524			.609		DE
2	.571			.521						PI
5	.543									PI
3		.774								PA
22		.758								PA
24		.730								PA
37		.708								PA
8		.685								PA
38		.538								AN
6		<b>.463</b>								AN
26			.750							SO
29			.713							SO
31			.685							SO
18			.620							SO
23			.603							SO
25			.550							OC
43				.816						HO
7				.729						HO
39	.544			.711						HO
35				.671				.544		HO
34				<b>.467</b>						HO
42	.564			.540	.804			.647		DE
17	.506				.773					IS
36	.573	.513			.717					IS
32	.635				.655					IS
4						.654				PS
33						.598				PS
13						.553				PI
1						<b>.335</b>				PS
30	.550		.595	.500			.848	.537		AN
41	.560		.529	.574	.526		.812	.532		AN
12	.513		.504	.523			.800			AN
10	.566			.548			.624	.740		DE
9	.617			.522			.554	.699		DE
28	.540		.544	.556			.553	.676	.577	OC
45								.518		PS
16									.772	OC
20									.721	OC
21					.582			.537	.587	OC

Note: IS=interpersonal sensitivity; DE=depression; PI=paranoid ideation; PA=phobic anxiety; AN=anxiety; SO=somatisation; HO=hostility; PS=psychoticism; OC=obsessive compulsion.

1.67 (3.71 %); 1.34 (2.99 %); 1.24 (2.76 %); 1.23 (2.73 %); and 1.08 (2.40 %). This difference in the variance percentage between the first factor and the remaining

factors leads us to consider the existence of a basic dominant factor. The correlations between the factors reached 0.72. On the other hand, a large majority of items have

been found to load in more than one factor with factor weights of over 0.5, which indicates the existence of overlap between items. Laid out below are the results obtained when the items are assigned to the different factors according to factor saturation. Table 1 shows the results obtained by assuming that an item should form part of a factor when its factor saturation within the factor itself is greater than or equal to 0.5. However, three items are included whose factor saturation did not reach 0.5 in any of the factors. The last column shows the scale that, in theory, and according to Sandín et al.'s (2008) work, should have an item assigned to it.

Of the 45 items that comprise the questionnaire, there are 21 that have loadings over 0.5 in the first factor. On the other hand, there are several cross-loading items. Analysing the composition of the factors in accordance with the categorisation proposals made by Sandín et al. (2008), the first factor would include the following scales: paranoid ideation (2, 5, 19, 40, and 44), depression (9, 10, 11, 27, and 42), interpersonal sensitivity (14, 15, 17, 32, and 36), three of the five items on the anxiety scale (12, 31 and 41), an item from the hostility scale (39) and two items from obsessive compulsion (21 and 28). It could be classed as a general factor of emotional maladjustment. The second factor would comprise the five items corresponding to the hypothetical scale of phobic anxiety (3, 8, 22, 24, and 37) along with two items assigned to the anxiety scale (6 and 38) and an item belonging to the scale of interpersonal sensitivity. The third factor would comprise items corresponding to the scale known as somatisation (18, 23, 26, 29, and 31) along with three items corresponding to the anxiety scale (12, 30, and 41) and two items from the scale of obsessive compulsion (25 and 28). The fourth factor includes the items from the hostility scale (7, 34, 35, 39, and 41) along with three items from the depression scale (9, 10, and 42), three from anxiety (12, 30, and 41), one from paranoid ideation (2), one from obsessive compulsion (28) and one from interpersonal sensitivity (14). Factor 5 is comprised of the five items on the scale of interpersonal sensibility (14, 15, 17, 32, and 36) along with three items from depression (10, 11, and 42), one from the anxiety scale (41), one from obsessive compulsion (21) and two from paranoid ideation (19 and 40). Factor 6 is clearly a factor of psychoticism (1, 4, 13, and 33, and requires only item 45 to complete the

proposed psychoticism scale. Factor 7 is a mixture of three items from anxiety (12, 30, and 41), two from depression (9 and 10), one from interpersonal sensitivity (14) and one from obsessive compulsion (28). Factor 8 includes the five items from the depression scale, (9, 10, 11, 27, and 42), two from the anxiety scale (30 and 41), two from obsessive compulsion (21 and 28), one from psychoticism (45), one from hostility (35) and one from interpersonal sensitivity (14). Finally, factor 9 comprises five items from the obsessive compulsion scale (16, 20, 21, and 28), and would require only item 25 for the scale to be complete. The highest correlations found were between factor 1 and factors 4, 5, 7, and 8, which are those in which items from all of the scales are combined.

To improve the interpretation of the results, the items that had the highest saturation in each factor were selected. The results were as follows:

- Factor 1: 2 (PI), 5 (PI), 19 (PI), 40 (PI), 44 (PI); 14 (IS), 15 (IS), 11 (D), 27 (D)
- Factor 2: 3 (PA), 8 (PA), 22 (PA), 24 (PA), 37 (PA), 38 (A), 6 (A)
- Factor 3: 18 (S), 23 (S), 26 (S), 29 (S), 31 (S), 25 (OC)
- Factor 4: 7 (H), 34 (H), 35 (H), 39 (H), 43 (H)
- Factor 5: 17 (IS), 32 (IS), 36 (IS), 42 (D)
- Factor 6: 1 (PS), 4 (PS), 13 (PS), 33 (PS)
- Factor 7: 12 (A), 30 (A), 41 (A)
- Factor 8: 9 (D), 10 (D), 28 (OC), 45 (PS)
- Factor 9: 16 (OC), 20 (OC), 21 (OC)

In Sandín et al.'s study (2008) the high level of correlation that exists between the items corresponding to the dimensions of paranoid ideation, interpersonal sensitivity and depression seems to indicate a content validity problem since there is a mixture of items in the same factor.

In order to obtain more information regarding the best way to assign the items to the various scales, a group of experts was asked to carry out a qualitative analysis, assigning each item to the proposed scales. The results highlighted the lack of consistency in the classifications, a fault that could be due to the imprecise definition of the different dimensions or of the constructs measured.

Table 2.

*Goodness-of-fit indexes for the different hypothetical models.*

	$\chi^2/gf$	NNFI	CFI	SRMR	RMSEA	AIC	AGFI
Model 1: nine basic factors.	1.16	1.00	1.00	0.068	0.027	1417.10	0.98
Model 2: structure proposed by Sandín et al.	1.61	0.99	0.92	0.084	0.048	1865.06	0.91
Model 3: nine first-order and one second-order factor.	1.63	0.99	0.99	0.091	0.046	1813,24	0.96

*Note.* NNFI = Non-Normed Fit Index; CFI = Comparative Fit Index; SRMR= Standardized Root Mean Square Residual; RMSEA= Root Mean Square Error of Approximation; AIC = Akaike’s Information Criterion; AGFI= Adjusted Goodness of Fit Index.

### ***Confirmatory factor analysis of the SA-45***

Various confirmatory factor analyses (CFA) were carried out, testing several models: (1) the nine-factor model found in the preceding exploratory factor analysis (EFA), (2) the nine-factor model proposed in Sandín et al. (2008), (3) a model with nine first-order factors and a second-order factor, which could be called ‘emotional maladjustment’. The results are shown in Table 2.

As shown, although all three models have good fits, the first seems to be the most suitable according to the global fit indexes values. The global fit model ranged from  $\chi^2/gf = 1.16$  for model 1 to 1.63 for model 3. The AGFI values ranged from .99 (model 1) to .96 (model 3). The

rest of the fit indexes were better for the model 1. This implies that model 1 represents in a better way the relationship between the items of SA-45. That is, model 1 comprised by nine basic factors defined above could be the best representation of the data.

### ***Reliability of the SA-45***

The Cronbach’s alpha coefficients of both the questionnaire as a whole and each of the nine scales were calculated. Table 3 shows the results obtained from the data for Model 1. Along with the alpha coefficient of each of the scales, an item-test correlation, and the coefficient of the scale if the corresponding item were eliminated, are included. Likewise, the mean is included, as well as the standard deviation of each scale and of the total. The values obtained from Cronbach’s alpha coefficient are quite high, with the exception of that for the psychoticism scale.

Table 3.

*Reliability of the obtained scales.*

Item	Correlation Item-Test corrected	Cronbach’s Alpha If eliminated	Mean	SD
<b>Factor 1 Paranoid Ideation (<math>\alpha = 0.87</math>)</b>			<b>5.24</b>	<b>5.34</b>
2. Others are to blame for most of your troubles	.523	.863		
5. Most people cannot be trusted	.477	.868		
11. Feeling no interest in things	.574	.858		
14. Feeling others do not understand or are unsympathetic	.760	.839		
15. Feeling that people are unfriendly or dislike you	.653	.851		
19. Feeling that you are watched or talked about by others	.583	.857		
27. Feeling hopeless about the future	.572	.859		
40. Others not giving you proper credit for achievement	.629	.852		
44. Feeling that people will take advantage of you if you let them	.703	.845		

Table 3 (continued).

*Reliability of the obtained scales.*

Item	Correlation Item-Test corrected	Cronbach's Alpha If eliminated	Mean	SD
<b>Factor 2 Phobic Anxiety (<math>\alpha = 0.84</math>)</b>			<b>1.40</b>	<b>2.67</b>
3. Feeling afraid in open spaces or in streets	.680	.799		
6. Suddenly scared for no reason	.448	.838		
8. Feeling afraid to go out of your house alone	.586	.814		
22. Feeling afraid to travel on buses, subways, or trains	.677	.800		
24. Having to avoid certain things, places, or activities because they frighten you	.671	.799		
37. Feeling uneasy in crowds	.642	.805		
38. Spells of terror or panic	.525	.828		
<b>Factor 3 Somatisation (<math>\alpha = 0.80</math>)</b>			<b>2.73</b>	<b>3.15</b>
18. Soreness of your muscles	.528	.789		
23. Hot or cold spells	.526	.770		
25. Your mind going blank	.469	.780		
26. Numbness or tingling in parts of your body	.648	.740		
29. Faintness or dizziness	.613	.747		
31. Feeling everything is an effort	.609	.752		
<b>Factor 4 Hostility (<math>\alpha = 0.80</math>)</b>			<b>1.04</b>	<b>2.02</b>
7. Temper outbursts that you could not control	.670	.730		
34. Having urges to beat, injure or harm someone	.460	.803		
35. Urges to break or smash things	.611	.750		
39. Getting into frequent arguments	.595	.772		
43. Shouting or throwing things	.674	.734		
<b>Factor 5 Interpersonal Sensitivity (<math>\alpha = 0.82</math>)</b>			<b>1.69</b>	<b>2.58</b>
17. Feeling inferior to others	.640	.779		
32. Feeling very self-conscious with others	.605	.803		
36. Feeling shy and uneasy with the opposite sex	.675	.762		
42. Feeling of worthlessness	.686	.762		
<b>Factor 6 Psychoticism (<math>\alpha = 0.57</math>)</b>			<b>0.48</b>	<b>1.13</b>
1. The idea that someone else can control your thoughts	.346	.566		
4. Hearing voices that other people do not hear	.369	.538		
13. Other people being aware of your private thoughts	.436	.413		
33. Having thoughts that are not your own	.441	.457		
<b>Factor 7 Anxiety (<math>\alpha = 0.87</math>)</b>			<b>2.30</b>	<b>2.53</b>
12. Feeling so restless you couldn't sit still	.735	.846		
30. Worrying too much about things	.779	.806		
41. Nervousness or shakiness inside	.770	.818		
<b>Factor 8 Depression (<math>\alpha = 0.75</math>)</b>			<b>2.32</b>	<b>2.53</b>
9. Feeling lonely	.643	.641		
10. Feeling blue	.682	.619		
28. Trouble concentrating	.572	.688		
45. The idea that you should be punished for your sins	.383	.783		
<b>Factor 9 Obsessive Compulsion (<math>\alpha = 0.77</math>)</b>			<b>1.35</b>	<b>1.89</b>
16. Having to do things very slowly to ensure correctness	.631	.655		
20. Having to check and double check what you do	.636	.671		
21. Difficulty making decisions	.567	.748		
<b>Scale total <math>\alpha = 0.95</math></b>			<b>18.53</b>	<b>18.35</b>

Table 4.

*Correlations between the different scales.*

Scale	1	2	3	4	5	6	7	8	9
1. Psychological D.	---								
2. Phobic anxiety	.443	---							
3. Somatisation	.504	.467	---						
4. Hostility	.611	.405	.431	---					
5. Interpersonal sensitivity	.711	.487	.452	.497	---				
6. Psychoticism	.275	.256	.178	.345	.332	---			
7. Anxiety	.579	.375	.537	.601	.502	.138	---		
8. Depression	.585	.427	.486	.626	.518	.073	.557	---	
9. Obsessive compulsion	.444	.400	.469	.452	.395	.275	.356	.528	---

mension has been adequate and appropriate. In table 4, the correlation between factors is presented.

## Discussion and Conclusions

One point that the results have highlighted is that the best solution found has nuances that differentiate it from the solutions proposed by other authors (Alvarado et al., 2012; Sandín et al., 2008) who have replicated Maruish et al.'s (1998) original model.

We understand that using a non-clinical population in the initial studies as opposed to a clinical one as in Maruish et al.'s study (1998) will in large part determine the results that are obtained. One of the first points that stand out is that the majority of the responses fall into the 0 and 1 categories. For example, for the item "Hear voices that other people do not hear", 97.8 % fell into category 0. This is not an isolated case; for as many as 7 items, over 90 % of the responses are concentrated in the 0 category. If we consider the first two response categories, 30 of the 45 items show over 90 % of responses falling into these two categories. This fact alone may show that the composition of these items is not appropriate for a "normal" population, or in this case, for participants without diagnosed psychopathological disorders.

In this study, we have not replicated the solution proposed by Maruish et al. (1998), though other authors have in fact done so (Alvarado et al., 2012; Sandín et al., 2008).

It is worth highlighting that in contrast to the previous studies, we discovered a factor in the EFA that explains one third of the total variability, which leads us to consider the existence of a factor of general character. This general character must have great specific weight in the configuration of any explanatory model on the dimensionality of the instrument.

Nevertheless, the intention in carrying out a CFA was to test Maruish et al.'s (1998) original model (model 2); this model has also been replicated by Sandín et al. (2008).

Specifically, we have discovered that the global fit indexes were acceptable for our data. Nonetheless, given that the sample used by Maruish et al. (1998) was of clinical subjects, that the response pattern of our study may be atypical for a non-clinical population, and that the results obtained in the EFA may suggest alternative factorial solutions, another two models were tested.

The first model, consistent with the results of the EFA, comprised nine dimensions, of which the majority contained a combination of items from Maruish et al.'s original dimensions. The first dimension, and the most explanatory, comprised a total of nine elements from three factors (paranoid ideation, interpersonal sensitivity and depression); the second factor had seven items related to phobic anxiety and anxiety. The global fit indexes of this solution are clearly better than those of the original model.

On the other hand, exploring the possibility that the model was one-dimensional, a third model was tested (model 3), with nine first-order factors and a general sec-

ond-order factor. The fit indexes were also acceptable, but although they are better than those obtained for the original model, they are worse than those obtained for model 1.

We understand that if the SA-45 is applied to a non-clinical population, we must evaluate whether scores ought to be corrected by Maruish et al.'s solution due to reasonable doubts as to whether the questionnaire is the best option for a non-clinical population. In this sense, we understand that the solution presented is best used as a measurement of the general mental health of the subjects rather than as a purely diagnostic test to be used in a psychiatric context.

Factor 1 encompasses elements of paranoid ideation, interpersonal sensitivity and depression. All the elements of factor 2 have the word "fear" in common, which may lead to the belief that its elements are not understood in the same way as in a population of clinical subjects. In factor 3, there is a mixture of items from the categories of somatisation and obsessive compulsion. The fourth factor makes clear reference to hostility, while in the fifth, elements of depression and interpersonal sensitivity are combined again. In other words, a subject who is probably not depressed will not interpret the combined content of the items in the same way clinical subjects interpret them. Factor 6 is, again, interpreted as psychoticism. Factor 7 is saturated with only three items from the original scale of anxiety that make reference to tension or nervousness. The eighth dimension includes a mixture from the categories of depression, obsessive compulsion and psychoticism. Specifically, the items refer to feeling sad, alone, incapable of concentrating and having constant thoughts of self-punishment. Finally, factor 9 refers to obsessive compulsion, and the items that make up this dimension are related to being indecisive and insecure.

The discrepant results obtained in this study suggest that there is a need to continue researching the factorial structure of the SA-45 in the non-clinical population. It could be concluded that the items are not understood in the same way when applied to this sample as when they are applied to a clinical sample group. In fact, different dimensions arise from those proposed by Maruish et al. (1998) in the studies carried out with non-clinical population that

may be related to personality traits. For this reason, more empirical evidence must be obtained on the configuration and the significance of the constructs in the SA-45 for the non-clinical population. Furthermore, the items should be adapted to this type of the population as necessary.

## References

- Alvarado, B. G., Sandín, B., Valdez-Medina, J. L., González-Arratia, N., & Rivera, S. (2012). Análisis factorial confirmatorio del Cuestionario SA-45 en una muestra mexicana [Confirmatory Factor Analysis of the SA-45 Questionnaire in a Mexican sample]. *Anales de Psicología*, 8(2), 426–433. <https://doi.org/10.6018/analesps.28.2.148851>
- Barendse, M. T., Oort, F. J., & Timmerman, M. E. (2015). Using Exploratory Factor Analysis to Determine the Dimensionality of Discrete Responses. *Structural Equation Modeling: A Multidisciplinary Journal*, 22(1), 87–101. <https://doi.org/10.1080/10705511.2014.934850>
- Calcedo, A. (2000). Evaluación forense. En J. Bobes, M. Bousoño, A. Calcedo y M. P. González (Eds.). *Trastorno de estrés postraumático [Post-traumatic Stress Disorder]* (pp. 287–299). Barcelona, Spain: Masson.
- Costello, A. B. & Osborne, J. W. (2005). Exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation*, 10(7), 1–9. Retrieved from <https://pareonline.net/pdf/v10n7.pdf>
- Davison, M., Bershadsky, B., Bieber, J., Silversmith, D., Maruish, M. E., & Kane, R. L. (1997). Development of a Brief, Multidimensional, Self-Report Instrument for Treatment Outcomes Assessment in Psychiatric Settings: Preliminary Findings. *Assessment*, 4(3), 259–276. <https://doi.org/10.1177/107319119700400306>

- Derogatis, L. R. (1977). *SCL-90R (revised version) manual I*. Baltimore: Johns Hopkins University School of Medicine.
- Derogatis, L. R. & Cleary, P. A. (1977). Confirmation of the Dimensional Structure of the SCL-90: A Study in Construct Validation. *Journal of Clinical Psychology*, 33, 981–989. [https://doi.org/10.1002/1097-4679\(197710\)33:4<981::AID-JCLP2270330412>3.0.CO;2-0](https://doi.org/10.1002/1097-4679(197710)33:4<981::AID-JCLP2270330412>3.0.CO;2-0)
- Derogatis, L. R. & Savitz, K. L. (1999). The SCL-90-R, brief symptom inventory, and matching clinical rating scales. In M. E. Maruish (Ed), *The use of psychological testing for treatment planning and outcomes assessment* (2nd Ed., pp. 679–724). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Derogatis, L. R., Lipman, R. S., & Covi, L. (1973). SCL-90: An Outpatient Psychiatric Rating Scale- Preliminary Report. *Psychopharmacology Bulletin*, 9, 13–27.
- Dutton, D. (2003). MCMI Results for Batterers: A Response to Gondolf. *Journal of Family Violence*, 18, 253–255. <https://doi.org/10.1023/A:1024072415872>
- Echeburúa, E., Amor, P. J., & Corral, P. (2003). Autoinformes y entrevistas en el ámbito de la psicología clínica forense: Limitaciones y nuevas perspectivas [The Forensic Psychological Evaluation in Front of the Clinical Evaluation: Proposals and Future Challenges]. *Análisis y Modificación de Conducta*, 29, 503–522.
- Fernández-Montalvo, J. & Echeburúa, E. (2006). Uso y abuso de los autoinformes en la evaluación de los trastornos de personalidad [Use and Abuse of Self-Reports in the Assessment of Personality disorders]. *Revista de Psicopatología y Psicología Clínica*, 11, 1–12. <https://doi.org/10.5944/rppc.vol.11.num.1.2006.4014>
- Gondolf, E. W. (2003). MCMI Results for Batterers: Gondolf Replies to Dutton's Response. *Journal of Family Violence*, 18, 387–389. <https://doi.org/10.1023/A:1026247515800>
- Holgado-Tello, F. P., Morata-Ramirez, M. A., & Barbero, M. I. (2018). Confirmatory Factor Analysis of Ordinal Variables: A Simulation Study Comparing the Main Estimation Methods. *Avances en Psicología Latinoamericana*, 36, 601–617. <https://doi.org/10.12804/revistas.urosario.edu.co/apl/a.4932>
- Holgado-Tello, F. P., Chacon, S., Barbero, I., & Vila, E. (2010). Polychoric versus Pearson Correlations in Exploratory and Confirmatory Factor Analysis of Ordinal Variables. *Quality and Quantity*, 44, 153–166. <https://doi.org/10.1007/s11135-008-9190-y>
- Hyler, S. E., Reider, R. C., Williams, J. B. W., Spitzer, R. L. Lyons, M., & Hendler, J. (1989). A Comparison of Clinical and Self Report Diagnoses of DMS-III Personality Disorders in 552 patients. *Comprehensive Psychiatry*, 30, 170–178. [https://doi.org/10.1016/0010-440X\(89\)90070-9](https://doi.org/10.1016/0010-440X(89)90070-9)
- Jöreskog, K. G. & Sörbom, D. (1996). *LISREL 8.8 User's Reference Guide*. Scientific software.
- Maruish, M. E., Bershady, B., & Goldstein, L. (1998). Reliability and Validity of the SA-45: Further Evidence from a Primary Care Setting. *Assessment*, 5(4), 407–420. <https://doi.org/10.1177/107319119800500410>
- Morata-Ramírez, M., Holgado-Tello, F. P., Barbero-García, I., & Mendez, G. (2015). Análisis factorial confirmatorio: recomendaciones sobre mínimos cuadrados no ponderados en función del error Tipo I de Ji-Cuadrado y RMSEA [Confirmatory Factor Analysis. Recommendations for Unweighted Least Squares Method Related to Chi-Square and RMSEA]. *Acción Psicológica*, 12(1), 79–90. <https://doi.org/10.5944/ap.12.1.14362>
- Osborne, J. W. & Fitzpatrick, D. C. (2012). Replication Analysis in Exploratory Factor Analysis: What it is and why it Makes your Analysis Better. *Practical Assessment, Research & Evaluation*, 17(15), 1-8.

Retrieved from <https://pareonline.net/pdf/v17n15.pdf>

- Osborne, J. W., Costello, A. B., & Kellow, J. T. (2008). Best Practices in Exploratory Factor Analysis. In J. W. Osborne (Ed.), *Best Practices in Quantitative Methods* (pp. 299–305). Thousand oaks, CA: Sage.
- Sandín, B., Valiente, M. R., Chorot, P., Santed, M. A., & Lostao, L. (2008). SA-45: forma abreviada del SCL-90 [SA-45: A Brief form of the SCL-90]. *Psicothema*, *20*(2), 290–296.
- Vassend, O., & Skrandal, A. (1999). The Problem of Structural Indeterminacy in Multidimensional Symptom Report Instruments: The case of SCL-90-R. *Behaviour Research and Therapy*, *37*, 685–701. [https://doi.org/10.1016/S0005-7967\(98\)00182-X](https://doi.org/10.1016/S0005-7967(98)00182-X)
- Yang-Wallentin, F., Jöreskog, K. G., & Luo, H. (2010). Confirmatory Factor Analysis of Ordinal Variables with Misspecified Models. *Structural Equation Modeling*, *17*(3), 392–423. <https://doi.org/10.1080/10705511.2010.489003>.
- Zimmerman, M. & Coryell, W. (1989). DMS III Personality Disorder Diagnosis in a Nonpatient Sample. Demographic Correlates and Comorbidity. *Archives of General Psychiatry*, *46*, 682–689. <https://doi.org/10.1001/archpsyc.1989.0181008012002>