Spanish version of the Gardner body image validation scale in patients with eating behavior disorders

M.ª A. Rodríguez Campayo[a], L. Beato Fernández[b], T. Rodríguez Cano[b] and F. Martínez-Sánchez[a]

[a] Basic Psychology and Methodology Dept. University of Murcia.
[b] Eating Disorders Unit. Hospital Virgen del Carmen. Ciudad Real

Adaptación española de la escala de evaluación de la imagen corporal de Gardner en pacientes con trastornos de la conducta alimentaria

Summary

This study reports the Spanish version of a new scale for the assessment of body image, developed by Gardner, Stark, Jackson and Friedman (1999). A silhouette method was used as a self-evaluation measure of schematic ideal body size within three groups of women: anorexia nervosa (n = 57), bulimia nervosa (n = 57) and normal control (n = 168). The results showed that, considering the body mass index as covariant of the results, the clinical groups formed by anorexic and bulimic patients judged their current body size as significantly greater than the control group. In the same way, the clinical groups judged their ideal body size significantly thinner than that considered by the control group. We can conclude that this scale for assessment is a sensitive psychometrical measure of the body image.

Key words: Anorexia nervosa. Bulimia nervosa. Body image. Psychological assessment.

Resumen

Este estudio recoge la adaptación española de la escala de valoración de la imagen corporal de Gardner, Stark, Jackson y Friedman (1999). La escala, basada en el empleo de siluetas corporales esquemáticas, fue aplicada a tres grupos de mujeres: 57 pacientes con anorexia nerviosa, 57 bulímicas y 168 controles. Los resultados mostraron que, considerando el índice de masa corporal en calidad de covariante de los resultados, los grupos clínicos formados por anoréxicas y bulímicas juzgaron su tamaño corporal como significativamente mayor que el grupo de control; del mismo modo, los grupos clínicos juzgaron su tamaño corporal ideal significativamente más delgado que el considerado por el grupo de control. Se concluye afirmando que esta escala es un instrumento psicométricamente sensible para evaluar la imagen corporal.

Palabras clave: Anorexia nerviosa. Bulimia nerviosa. Imagen corporal. Evaluación psicológica.

INTRODUCTION

It is considered that the body image is made up by both perceptual components (how one sees him/herself) as well as attitudinal components (how one feels)[1-2].

An alarming number of adolescents are unsatisfied with their body; this tendency has been growing slowing, thus, while in 1972 it was estimated[3] that 6% of adolescents were not satisfied with their body image, in 1986, this value increased to 78%[3]. Consequently, Wadden et al.[4] report that almost 70% of a sample of adolescents suffering from overweight had been on a diet during the previous year.

Studies on estimation of body weight and its relationship with eating behavior disorders (EBD) have been traditionally focused on the study of body image distortions present in patients with anorexia and bulimia, understanding distortion of the body image as perceptual incapacity to reliably assess body size and shape[5-7]. In general, these studies have shown that those who suffer eating behavior disorders tend to significantly overestimate their body mass, suffering alterations of self-estimation of the body image, a process modulated by many affective, cognitive, behavioral factors, potentially capable of explaining the propioceptive distortions[8].

The perception distortion of anorexic and bulimic subjects with their body image is a traditionally accepted fact[7], and thus, it is gathered within the diagnostic criteria of eating behavior disorders[9]. This distortion is focused on body size and shape[5,10]; in fact, decrease of body image distortion is an accepted index of EBD treatment evolution, so that several treatments aimed at modifying this distortion have been developed[11-15].

Correspondence:

Francisco Martínez-Sánchez
Departamento de Psicología Básica y Metodología
Facultad de Psicología. Edificio Luis Vives
Universidad de Murcia. Campus de Espinardo
30080 Murcia (Spain)
E-mail: franms@um.es

In a review, Thompson[16] gathered more than 100 instruments developed for this end, all them classified as «shape stimuli.» These typically assess size, silhouette, weight and satisfaction with body image estimated by the subject. Most of the scales have a certain number of silhouettes (generally between 7 and 9) on a card on which there are silhouettes in ascending size from left to right. Based on these, the subject should mark the estimation of his/her present weight. Furthermore, the body image considered ideal for the patient is assessed. The difference between both estimations would represent a magnitude index of the discrepancy between present and ideal state, it also being interpreted as a measure of satisfaction with the body image[17].

The scales having a Liket type response format in which a reduced number of silhouettes are presented have been repeatedly criticized[18], since these would hardly be capable of representing a continuous type variable, such as that which is being attempted to evaluated. The restriction in the range of possible stimuli affects the reliability of the instrument; however, the presentation of a very high number of silhouettes also produces distortions in the reliability of the scale, because it is known that the range of silhouettes that is selected is generally about eight most of the times[19] and this fact may artificially increase the test-retest reliability indexes of these scales[20].

Another factor that biases the results of these scales is the proportional magnitude of the chest and waist in the stimuli that are close to the scale extremes, in relationship to the central figure that supposedly represents normality, as is demonstrated by Gardner, Friedman and Jackon[19] when they analyzed the silhouettes of Stunkard, Sorenson and Schlusinger[21]. Thus, they advise that caution should be taken regarding the results obtained with the application of these scales.

In the present study, we proposed to adapt the Gardner, Stark, Jackson and Friedman[22] body image scale, as we estimate that it presents psychometric qualities that recommend its use, both for clinicians as well as investigators interested in the estimation of body image distortions present in patients with EBD.

METHOD

Subjects

A total of 282 women whose ages ranged from 13 to 35 years participated in this study. Of them, 168 made up the control group, all being students from the University of Murcia. The rest, 114, was formed by patients diagnosed with DSM-IV criteria[9] and under treatment for EBD (table 1), either because they had anorexia (n = 57) or bulimia (n = 57). They came from the EBD Treatment Unit of the Hospitals of Niño Jesús (Madrid) and Virgen del Carmen (Ciudad Real), as well as from ADANER (Albacete). When the mean age of the three groups was compared, no significant differences were found ($F_{(2, 279)}$ = 1.2; p > 0.10). On the other hand, the existence of significant differences among the three groups was observed

TABLE 1. Descriptive statics of the groups: sample size, age, weight and BMI

Group	N (%)	Age (SD)	Weight (SD)	BMI (SD)
Anorexia	57 (20.2)	20.88 (5.76)	47.74 (8.97)	18.34 (2.39)
Bulimia	57 (20.2)	21.69 (5.38)	62.29 (13.50)	22.70 (4.46)
Control	168 (59.6)	19.75 (3.68)	58.58 (7.84)	21.24 (2.50)

BMI: body mass index corporal (weight/height^2). SD: standard desviation.

in the body mass index (BMI) ($F_{(2, 279)}$ = 33.78; p < 0.000), as well as in weight ($F_{(2, 279)}$ = 37.09; p < 0.000).

Instruments

The Gardner, Stark, Jackson and Friedman body image assessment scale[22] was used. This scale is formed by thirteen silhouettes of 8 cm in height, that represent schematic outlines of the human figure that lack any attribute such as hair, face, etc. (fig. 1). The silhouettes were elaborated following the National Health Center statistics of the USA for a mean age of 19 years and weight of 63,99 kg (SD = 14,53). The middle figure represents the median of the weight distribution for the reference population and the changes were based on this, increasing or decreasing its volume ± 30% until six more silhouettes, which represented weight increase in growing order (5%, 10%, 15%, 20%, 25% and 30%) as well as six others that proportionally represented the progressive weight decrease (–5%, –10%, –15%, –20%, –25 % and –30%) were constructed. All this provided a continuum of silhouettes, whose details represent an extremely thin figure and another obese one.

The scale makes it possible to obtain three indexes: the first represents the present perception of their body image; the second, the image that the patients estimate as «ideal» for them. Finally, the evaluator marks the real image that each one of the patients shows. In this way, it is possible to assess the degree of adjustment between the image perceived and desired, as well as an estimation of the objective body image performed by the evaluator.

In the original study, Gardner, Stark, Jackson and Friedman[22] used 100 students (32 men and 68 women) whose mean weight was 62.01 kg, their BMI being 22.2. It should be mentioned that in the original study, the authors also presented two more assessment procedures, in which variations of this scale were implemented, using both an analogue scale with two silhouettes that represent the extreme points as well as by the use of video projection of the silhouettes. In this study, we omit the analysis of both procedures as we consider that both make the clinical evaluation difficult, given the need to perform complex image projection systems, that require a use of time that the clinician generally does not have.

Procedure

All the participants were invited to collaborate voluntarily in this study. After obtaining their anthropometric
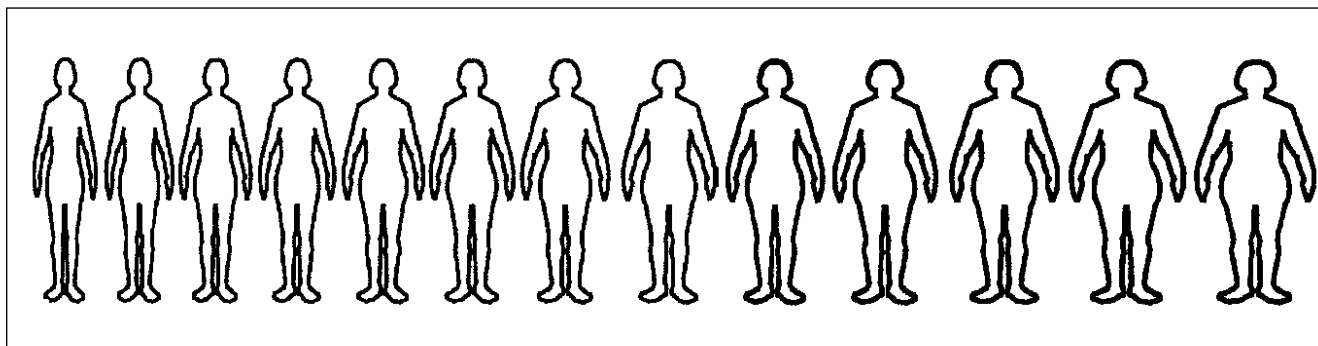
Figure 1. Silhouettes that make up the Gardner, Stark, Jackson and Friedman scale (1999).

data of height and weight, they were instructed to put a cross (X) on the silhouette that would represent the perception that they presently have of their body image; after, they were requested to estimate the silhouette that best represented the figure that they would like to have by marking it with a circle (O). Finally, the evaluator indicated his estimation of the body image of the participant with an asterisk (*). In order to avoid biases in the estimation of the evaluator of the body image of the participants' in this study, all the evaluations were performed by the same evaluator with wide experience in this field.

RESULTS

Validity

The validity of the scale lies in the correct estimation of weight and body mass index of the subjects evaluated. Concurrent validity was estimated, assessing the relationship between the subjects' weight and their estimations of the present weight and BMI for all the groups.

As can be seen in table 2, the estimations of the present image show greater correlations with weight and BMI in the control group, while the anorexia and bulimia groups make noticeably more biased estimations of their present image (table 2).

In relationship to the estimation of the present and desired image, table 3 gathers the degree of deviation on the three indexes obtained from the scale: perceived, desired and real image (estimated by the evaluator). On its

part, table 4 gathers the percentages of deviation, in absolute values, in the three indexes. As can be seen in table 4, the difference between the perceived and desired image is considered an index of dissatisfaction with body image, while the difference between perceived and real image is considered an index of distortion of the body image (figs. 2 and 3). We differentiate between dissatisfaction and body image distortion indexes, since although both indexes are often similar, they should be differentiated, because dissatisfaction with one's own body should be considered a manifestation of the body image disorder, which is a wider concept that includes many components[23] (tables 3 and 4 and figs. 2 and 3).

After, we analyzed independently the relevant dependent variables obtained after the application of the scale: perceived image and desired image, following the models proposed by Williamson, Davis, Goreczny and Blouin[24] and Williamson, Cubic and Gleaves[25]. To do so, we performed a covariance analysis (ANCOVAS) for both variables, considering the body mass index (BMI) as covariant. The results showed that the BMI is a significant covariant, both of the perceived image ($F_{(2,279)} = 88.82$; $p < 0.000$; $r = 0.323$) as well as the desired one ($F_{(2,279)} = 50.04$; $p < 0.000$; $r = 0.230$).

After adjusting the data obtained with the significant covariant variable (BMI), we compared the differences

TABLE 2. Correlations between estimation of the present perceived image, weight and BMI for each group

Group	Weight	BMI
Anorexia	0.332*	0.322*
Bulimia	0.401**	0.380*
Control	0.627**	0.673***

*p < 0.01; **p > 0.001; ***p < 0.000.

TABLE 3. Mean scores per groups in the three indexes of the scale: perceived, desired and real image

Group	Body image		
	Perceived	Desired	Real
Anorexia	−0.36	−3.28	−3.67
Bulimia	1.80	−2.00	−0.71
Control	−0.52	−1.88	−1.03

The central figure was weighted with the value 0, while we assigned negative values (from −1 to −6) for the figures placed to the left of the central figure that represent the decrease in body mass; in the same way that positive values (from 1 to 6) were assigned for the figures located to the right of the central silhouette, that represents the slow increase of body mass.

TABLE 4. Percentages of deviation, in absolute values, of the diffeerences between the perceived, desired and real image

Group	Differences between image (%)		
	Perceived/ desired	Perceived/ real	Desired/ real
Anorexia	14.56	16.55	1.98
Bulimia	19.01	12.58	6.42
Control	6.84	3.09	3.75

The difference between the perceived and desired image is considered an index of *dissatisfaction* with the body image, while the difference between the perceived and real image is considered an index of *disortion* of the body image.

between the perceived, desired and real image in the three groups; the results showed the existence of significant intergroup differences in the difference between the perceived and desired image ($F_{(2,279)} = 24.66$; $p < 0.000$), as well as between the perceived and real one ($F_{(2,279)} = 53.40$; $p < 0.000$). The post hoc analyses of the adjusted means verified the same pattern of results, that is, while the clinical groups of patients with anorexia and bulimia did not differ between themselves, both groups showed perceived, desired and real image indexes that were significantly different from those obtained by the control group.

Reliability

Different reliability indexes of the scale were calculated. To do so, we used two samples composed of 61 subjects from the control group and 50 from the clinical group (25 anorexic and 25 bulimic). The scale was ad-
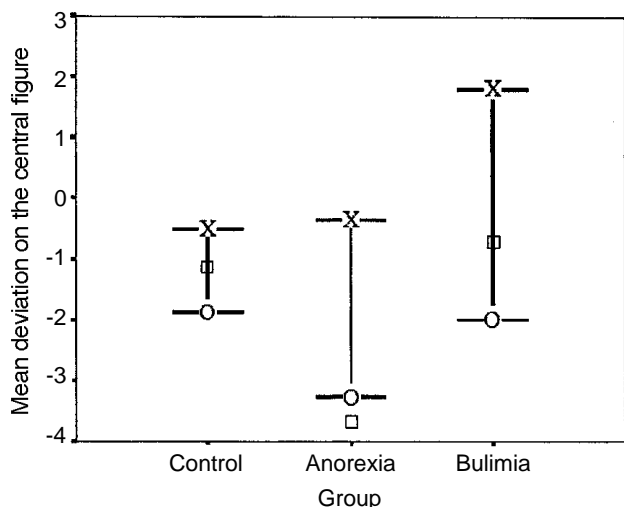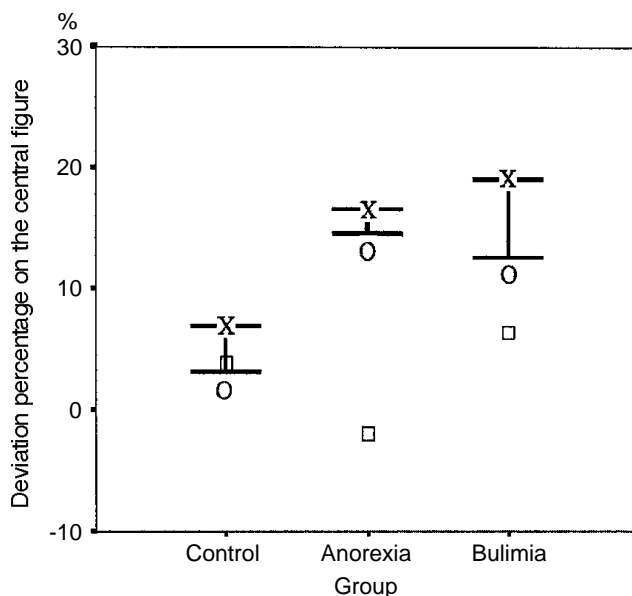
Figure 3. Graph of the percentages of deviation between the differences of perceived, desired and real image. X: perceived image–real image; O: perceived image–desired image and; □ real image – desired image.

ministered for the second time in a three week period to both groups. Different reliability indexes were performed: the correlation obtained between both applications (test-retest method), the correlations between the perceived image, weight and BMI, as well as the correlations between the dissatisfaction and distortion indexes between the first and second application. The results appear in table 5.

DISCUSSION AND CONCLUSIONS

These results substantially agree with various meta-analytic reviews regarding the alteration of the body image in eating behavior disorders. Thus, the meta-analyses performed by Smeets, Smit, Panhuysen and Ingleby[27] and Cash and Deagle[28] conclude that the lesser the body size of the anorexic subjects, the greater the overestimation they make of it. Our results show how the clinical groups perform more biased estimations of their body image than the control group, because the patients with

Figure 2. Graph of the mean scores obtained by the three groups of the subjects on the scale. X: percived image; O: desired image; □ real image.

TABLE 5. Reliability (r) indexes obtained

Group	Method				
	Test-retests	Correlation scale and weight	Correlation scale and BMI	Dissatisfaction index	Distortion index
Control	0.84*	0.59*	0.67*	0.79*	0.88*
Clinic	0.80*	0.57*	0.64*	0.75*	0.83*

*$p < 0.001$.

anorexia nervosa present a greater degree of body image distortion than the bulimics and controls, while the bulimics present greater levels of dissatisfaction with their body image than the remaining groups.

In the same way, these results manifest the need that has already been previously mentioned by other authors[29,30] to control the present weight of the patients when performing analyses on their body image assessment, since, as has been manifested in our results, the BMI exerts a significant covariant role, biasing the results of the estimation of the body image.

Psychometrically, the results show the satisfactory properties of the instrument, thus, the reliability index widely exceeds the criterion established by Nunnally[26], it being comparable to the original scale reported by its authors (r = 0.87; p < 0.0005). In the same way, the concurrent validity indexes of this adaptation are comparable to those of the original scale; thus, for example, Gardner et al. obtain high correlations between the scores obtained in the scale with weight (r = 0.62; p <0.0005) and BMI (r = 0.62; p <0.0005), very similar to those obtained in this study: r = 0.58; p < 0.001, y r = 0.65; p < 0.001, respectively.

For this reason, we consider that this scale represents a valid and reliable procedure of assessment of body image, because: *a)* it makes it possible to obtain dissatisfaction and distortion indexes of the body image; *b)* the format of the interval in which the figures are made makes it possible to analyze them using parametric statistics, solving the problems present in other scales, made using ordinal scales, which requires the use of non-parametric statistics, less potent statistically; *c)* it makes it easier to obtain indexes on over- or underestimation of the body mass to relate them with the body mass index, and *d)* the scale is psychometrically comparable and superior, in many cases, to other scales.

Finally, as mentioned by Gardner, Stark, Jackson and Friedman[22], this scale presents some of the typical problems of this type of instruments: thus, for example, it is not possible to define the perception of overweight in different parts of the body.

REFERENCES

1. Kearney-Cooke A, Striegel-Moore R. The aetiology and treatment of body image disturbance. En: Garner DM, Garfinkel PE, editores. Handbook of treatment for eating disorders, 2.ª ed. Nueva York: Guilford Press, 1997; p. 295-306.
2. Rosen JC, Reiter J, Orosan P. Cognitive-behavioral body image therapy for body dysmorphic disorder. J Consult Clin Psychol 1995;63:263-9.
3. Eisele J, Hertsgaard D, Light HT. Factors related to eating disorders in young girls. Adolescence 1986;82:283-90.
4. Wadden TA, Foster GD, Stunkard AJ, Linowitz JR. Dissatisfaction with weight and figure in obese girls: discontent but not depression. Int J Obesity 1989;13:89-97.
5. Beebe DW. The attention to body shape scale: a new measure of body focus. J Pers Assess 1995;65:486-501.
6. Birtchnell SA, Lacey JH, Harte A. Body image distortion in bulimia nervosa. Br J Psychiatry 1985;147:408-12.
7. Garner DM, Garfinkel PE. Body image in anorexia nervosa: measurement, theory and clinical implications. Int J Psychiatry Med 1981;11:263-84.
8. Beebe DW, Holmbeck GN, Grzeskiewicz C. Normative and psychometric data on the body image assessment-revised. J J Pers Assess 1999;73:374-94.
9. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 4.ª ed. Washington: Author, 1994.
10. Bowden PK, Touyz SW, Rodríguez PJ, Hensley R, Beumont PJV. Distorting patient or distorting instrument: body shape disturbance in patients with anorexia nervosa and bulimia. Br J Psychiatry 1989;155:196-201.
11. Gillespie J. Rejection of the body in women with eating disorders. Arts Psychother 1996;23:153-61.
12. Kessler K. A study of the diagnostic drawing series with eating disordered patients. J Am Art Ther Assoc 1994;11: 116-8.
13. Rosen JC, Orosan P, Reiter J. Cognitive behavior therapy for negative body image in obese women. Behav Ther 1995; 26:25-42.
14. Rosen JC, Saltzberg E, Srebnik D. Behavior therapy for negative body image. Behav Ther 1989;20:393-404.
15. Schneider S, Ostroff S, Legow N. Enhancement of body-image: a structured art therapy group with adolescents. Art Ther 1990;134-9.
16. Thompson JK. Assessment of body image. En: Allison DB, editor. Handbook of assessment methods for eating behaviors and weight related problems. Thousand Oaks: Sage, 1995; p. 119-44.
17. Thompson JK, Gray JJ. Development and validation of a new body-image assessment scale. J Pers Assess 1995;64: 258-69.
18. Russell CJ, Bobko P. Moderated regression analysis and Likert scales: too coarse for comfort. J Appl Psychol 1992; 77:336-42.
19. Gardner RM, Friedman BN, Jackson N. Methodological concerns using silhouettes to measure body image. Percept Mot Skills 1998;86:387-95.
20. Gardner RM, Friedman BN, Jackson N. Development changes in children's body images. J Soc Behav Pers 1997; 25:55-68.
21. Stunkard AJ, Sorenson T, Schlusinger F. Use of danish adoption register for the study of obesity and thinness. En: Kety S, Rowland LP, Sidman RL, Matthysse SW, editores. The genetics of neurological and psychiatric disorders. Nueva York: Raven, 1983; p. 115-20.
22. Gardner RM, Stark K, Jackson N, Friedman BN. Development and validation of two new scales for assessment of boby-image. Percept Mot Skills 1999;87:981-93.
23. Thompson JK. Assessment of body image. En: Allison DB, editor. Handbook of assessment methods for eating behaviours and weight related problems. Thousand Oaks: Sage, 1995; p. 119-44.
24. Williamson DA, Cubic BA, Gleaves DH. Equivalence of body image disturbances in anorexia and bulimia nervosa. J Abnorm Psycol 1993;102:177-80.
25. Williamson DA, Davis CJ, Goreczny AJ, Blouin DC. Body image disturbances in bulimia nervosa: influences of actual body size. J Abnorm Psycol 1989;98:97-9.
26. Nunnally JC. Pschycometric Theory. Nueva York: McGraw-Hill.

27. Smeets MA, Smit F, Panhuysen GE, Ingleby JD. Body perception index: benefits, pitfalls, ideas. J Psychosom Res 1998;44:457-64.

28. Cash TF, Deagle EA. The nature and extent of body image disturbances in anorexia nervosa and bulimia nervosa: a meta-analysis. Int J Eat Disord 1997;22:107-25.

29. Ben-Tovin DI, Walker MK, Murray H, Chin G. Body size estimates: body image or body attitude measures? Int J Eat Disord 1990;9:57-67.

30. Penner LA, Thompson JK, Coovert DL. Size estimation among anorexics: much do about very little? J Abnorm Psycol 1991;100:90-3.