Body Image Assessment Software: A new program for assessing body-image disturbance using adjustable partial image distortion

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Abstract

The BIAS (Body-Image Assessment Software) is an innovative interactive computer program developed to assess body-image disturbances. The BIAS is a simple, fast and economical method for assessing body-size distortion and body dissatisfaction which works by modifying a scale image of the subject's figure. The software can be run on any computer that has Windows and Microsoft Access or Microsoft Access RunTime, and the data can be exported to applications such as SPSS and Excel. Thus, the strong points of the software are its accessibility and its ability to generate a female figure to scale that represents the real silhouette of the patient.

This study analysed the psychometrical properties of the BIAS. The program was administered to 252 psychology students at the University of Barcelona and 25 patients with eating disorder (ED). The participants filled in the Eating Attitudes Test (EAT-26), the Body Shape Questionnaire (BSQ), the Body Dissatisfaction Scale of the Eating Disorders Inventory (EDI-2-BD) and a test of silhouettes (the Body Image Assessment-Revised, BIA-R).
The results showed good validity and very high reliability. Furthermore, the BIAS is able to discriminate between people who are at risk of an ED and those who are not, and between subjects who have a history of ED and those who do not. Those at risk of having an ED and those with a current ED showed more body image distortion and body image dissatisfaction.

The BIAS is free available at http://www.ub.es/personal/rv/ecic.htm

- Body-image disturbance has been one of the most widely studied areas in relation to eating disorders. Two aspects of body image dysfunction are usually distinguished: perceptual distortion and body dissatisfaction. Perceptual distortion is the inability to accurately perceive one's body size, and body dissatisfaction represents the degree to which people are content with the size and shape of their bodies.

- Two large groups of visual tasks have traditionally been used to assess these disturbances: body parts size procedures and whole body procedures. Both types of procedures have their own methodological drawbacks. In whole body assessment, subjects modify the shape or size of the whole body, that is, they introduce the same amount of distortion throughout; therefore the test does not provide information on distortions in specific body parts. In turn, body part size estimation procedures allow the differential distortion of body parts but do not offer a holistic vision of the body image. The fact that most of the techniques included in these procedures offer only a frontal view of the body is an additional problem.

- In recent decades, many of the methodological failings of traditional body image assessing procedures have been overcome by the use of computers which can combine estimation procedures for whole body and body parts. Examples are Body Build (Dickson-Parnell, Jones, Braddy & Parnell, 1987); the Body Image Testing System (BITS; Schlundt & Crystal Bell, 1993); Phillip Benson's software (Benson, Emery, Cohen-Tovée & Tovée, 1999) and BodyImage (Shibata, 2002). Moreover, virtual reality has allowed the creation of more realistic programs for body image assessment, in which the silhouettes appear in three dimensions. The Body Image Virtual Reality Scale (BIVRS; Riva, 1997, 1998) and The Virtual Body (Perpiña, Botella, Baños, Marco, Alcañiz & Quero, 1999; Perpiña, Botella & Ramos, 2000) are examples of this.

- Despite the usefulness of these software programs, they have several drawbacks that must be taken into account. Some of them show highly unrealistic figures, and so it is usually quite difficult for the subjects to identify with the image displayed. Moreover, most of them use the therapist's subjective estimation to define the prototype that best fits the subject's real figure, with the result that the image presented to the subject is only an approximation of his or her real image. The main drawback of others, like BodyImage, is that they only show the whole figure of the subject or a part of it, and do not allow differential distortion of body parts in their holistic feedback on the body.

Objective:

To assess psychometrical properties of the Body Image Assessment Software (BIAS); to determine whether BIAS is a good instrument for the assessment of body image disturbances: body image distortion and body image dissatisfaction

The BIAS displays side and frontal views of a scale female human figure which is the same size as the subject. The image can be adjusted by independent modification of six body parts (head, arms, breasts, waist, hip and legs) in the frontal view, and five body parts in the side view (head, breasts, waist, hip and legs), using the computer mouse. The subject's real body image is generated by entering its objective measurements in a data base.

The program proposes two visual tasks, which can be administered together or independently:

•Perceived body image assessment: Several frontal and side body parts are modified in order to make a human figure as similar as possible to the real body image. The discrepancy between the real and perceived body sizes provides information about subjects' degree of *perceptual distortion*

•Ideal body image assessment: Frontal and side body parts are modified to make a human figure representing the ideal body image. The discrepancy between subjects' perceived body size and their ideal body size provides information about their degree of *body image dissatisfaction*

Materials and methods:

Subjects
The BIAS was administered to 252 psychology students at the University of Barcelona and 25 patients with an eating disorder diagnosis (17 with anorexia nervosa, 6 with bulimia nervosa and 2 with non-specific eating disorder). The mean age of the students was 22.08 years (SD=3.97) and mean body mass index (BMI) 21.44 (SD=2.97). The mean age of the patients was 21.60 years (SD=5.56) and their mean BMI was 19.36 (SD=4.09).

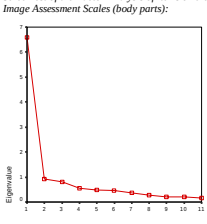
Procedure
The assessment was carried out in two stages. In the first stage, the participants filled in the EAT-26, the BSQ, the Body Dissatisfaction Scale of the EDI-2 and the BIA-R. In the second stage, participants were measured and weighed, and the results were introduced in the BIAS software. The test was then administered.

Instruments
•EAT-26 (Eating Attitudes Test). Garner and Garfinkel (1979)
•BSQ (Body Shape Questionnaire). Cooper, Taylor, Cooper and Fairburn (1987)
•EDI-2-BD (Body Dissatisfaction Scale of the Eating Disorders Inventory). Garner (1998)
•BIA-R (Body Image Assessment-Revised). Beebe, Holmbeck and Grzeskiewicz. (1999)
•BIAS (Body Image Assessment Software). Letosa-Porta, Ferrer-Garcia and Gutiérrez-Maldonado (2005)

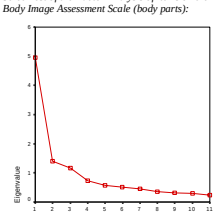
Results and discussion:

The results suggest that the BIAS is a good measure of both perceived and ideal body image. All correlations between different body parts were positive and significant in both assessment tasks (perceived body image and ideal body image).

Scree Test of the Factor Analysis of items on the Perceived Body Image Assessment Scales (body parts):



Scree Test of the Factor Analysis of items on the Ideal Body Image Assessment Scale (body parts):

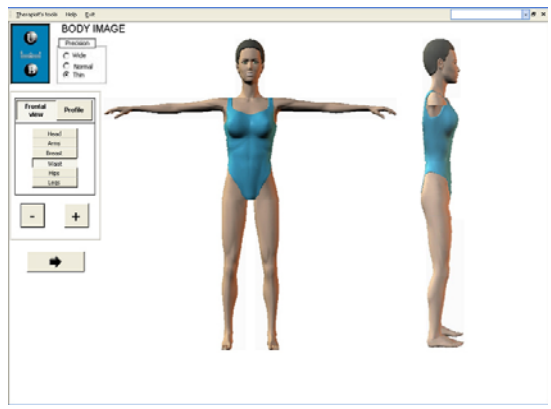


Principal Components Analysis and Varimax Rotation were used to test how the items (different body parts) grouped on each scale. The factor analysis of body parts in the perceived body image assessment scale extracted at most two components. The first main component explains 59.878% of the total variance. Adding the second component to the first one, 68.18% of variance is explained. In any case, it seems advisable to consider just one component.

The factor analysis of all body parts in the ideal body image assessment scale showed a first main component that accounted for 44.99% of the variance. Adding another component to the first one, 57.815% of the variance is explained.

These factor analyses show that a large part of the variance in the perceived and ideal body image scales can be explained by just one factor, or at most two. Both scales thus show good construct validity.

BIAS: Body Image Assessment Software



BIAS also has very good convergent validity. The correlations between the level of body dissatisfaction measured with the BIAS and all other measures of body dissatisfaction (Body Shape Questionnaire, Body Dissatisfaction Scale of the Eating Disorder Inventory and the Body Dissatisfaction Scale of the Body Image Assessment-Revised) were positive and significant. Equally, the correlation between body image distortion measured with the BIAS and the Body Image Distortion Scale of the BIA-R is positive and significant.

BIAS:		**BSQ**	**EDI-2 (BD)**	**BIA-R**
Body dissatisfaction	Control subjects	r = -0.630; p < 0.001	r = -0.612; p < 0.001	r = 0.,707; p < 0.001
	Patients	r = -0.600; p = 0.002	r = -0.477; p = 0.018	r = 0.495; p = 0.012
Body image distortion	Control subjects			r = 0.365; p < 0.001
	Patients			r = 0.503; p = 0.010

Both body dissatisfaction (t = 7.277; p < 0.001) and body image distortion (t = -4.443; p < 0.001) measures of the BIAS are able to discriminate between those likely to suffer an ED (EAT-26>20) and those unlikely to do so (EAT-26<20). Both body dissatisfaction (t = 6.985; p < 0.001) and body image distortion (t = -8.373; p < 0.001) measures of the BIAS also discriminate between patients and controls. ED patients and subjects likely to suffer an ED show a higher level of body image dissatisfaction and body image distortion. The BIAS also showed very high reliability (Cronbach's Alpha = 0. 8487).

Conclusion:

The results show that BIAS has good psychometric properties and is a valid instrument for the assessment of body image distortion and body image dissatisfaction.

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References:

•Benson, P.J.; Emmery, J.L.; Cohen-Tovée, E.M. & Tovée, M.J. (1999). A computer-graphic technique for the study of body size perception and body types. *Behavior Research Methods, Instruments & Computers*, 31(3), 446-454
•Dickson-Parnell, B.; Jones, M.; Braddy, D. & Parnell, C.P (1987). Assessment of body image perceptions using a computer program. *Behavior Research Methods, Instruments & Computers*, 19, 353-354
•Letosa-Porta, A.; Ferrer-Garcia, M. & Gutiérrez-Maldonado, J. (2005). A program for assessing body image disturbance using adjustable partial image distortion. *Behavior Research Methods*, 37(4), 638-643
•Perpiña, C.; Botella, C. & Ramos, R.M. (2000). *Imagen corporal en los trastornos alimentarios. Evaluación y tratamiento mediante realidad virtual*. Valencia: Promolibro
•Perpiña, C.; Botella, C.; Baños, R.; Marco, J.H; Alcañiz, M. & Quero, S. (1999). Body Image and Virtual Reality in Eating Disorders: Is Exposure to Virtual Reality More Effective than the Classical Body Image Treatment? *CyberPsychology & Behavior*, 2(2), 149-155
•Riva, G. (1997). Virtual reality as assessment tool in Psychology. In G. Riva (Ed.), *Virtual Reality in Neuro-Psycho-Physiology*. Amsterdam: IOS Press
•Riva, G. (1998). Virtual environment for body image modification: virtual reality system for treatment of body image disturbances. *Computer in Human Behavior*, 14(3), 477-490
•Schlundt, DG & Bell, C (1993) Body Image Testing System: A Microcomputer Program for Assessing Body Image. *Journal of Psychopathology and Behavioral Assessment*,15(3), 267-285
•Shibata, S. A. (2002). Macintosh and Windows program for assessing body-image disturbance using adjustable image distortion. *Behavior Research Methods, Instruments & Computers*, 34(1), 90-92