MEASUREMENT IN PHYSICAL EDUCATION AND EXERCISE SCIENCE, *9*(1), 61–66

The Impact of Silhouette Randomization on the Results of Figure Rating Scales

Michael J. Duncan
Department of Physical Education and Sports Studies
Newman College of Higher Education

Lorna J. Dodd
Department of Psychology
Newman College of Higher Education

Yahya Al-Nakeeb
Department of Physical Education and Sports Studies
Newman College of Higher Education

This study was designed to examine the impact of silhouette randomization on the responses to rating scales developed to rate the perceived current and ideal body shape, as well as body dissatisfaction. Seventy students (30 men and 40 women), ages 18 to 43 ($M \pm SD = 22.1 \pm 5.7$) years, completed the Stunkard, Sorensen, and Schulsinger (1983) Figure Rating Scale twice, approximately 2 weeks apart in a randomized, counterbalanced order. On one occasion, the traditional scale was completed, and another scale with a randomized set of silhouettes was completed. Results indicated a significant relationship between the traditionally and randomly presented scales for perceived current and ideal body shapes and for body dissatisfaction (all $p < .01$). Wilcoxon signed-ranks test revealed no significant mean rank difference between the two scales for perceived current and ideal body shapes and body dissatisfaction (all $p > .05$). Randomization of figures does not appear to have an impact on results from the Figure Rating Scale, and the sequentially presented scale appears to be appropriate for body image assessment.

Key words: body image, randomization

Requests for reprints to Michael J. Duncan, Department of Physical Education and Sports Studies, Newman College of Higher Education, Birmingham, England, B32 3NT. E-mail: m.j.duncan@newman.ac.uk

Negative body image and body dissatisfaction are important variables that are related to an individual's body fatness, physical activity behaviors, lifestyle, and general wellness (Duncan, Woodfield, O'Neill, & Al-Nakeeb, 2002; Huddy, Johnson, Stone, Prolux, & Pierce, 1997; Krane, Stiles-Shipley, Waldron, & Michalenok, 2001). The accurate evaluation of body image is therefore of interest to physical educators and to sport and exercise scientists. One of the most widely used techniques to assess body image and body dissatisfaction within sport and exercise settings has been the use of silhouette rating scales (Hart, 2000). These scales are attractive as assessment tools because they have face validity, are quick to administer, and are inexpensive to use (Hart, 2000; Thompson & Altabe, 1991; Truby & Paxton, 2002). Furthermore, the visual images used in silhouette rating scales are less abstract and require less verbal fluency to complete compared to questionnaire measures (Truby & Paxton, 2002). Possibly the most utilized tool to measure body image has been the Stunkard, Sorensen, and Schulsinger (1983) Figure Rating Scale. The psychometric properties of this scale have been well established, and it has been used with various populations including adults and children (Sherman, Iacono, & Donnelly, 1995; Thompson & Altabe, 1991). Test–retest reliability scores of .89 to .92 for measures of current body shape and .71 to .82 for ideal body shape in men and women have been reported (Thompson & Altabe, 1991).

The use of figure rating scales, in particular the Stunkard et al. (1983) scale, to assess body dissatisfaction has been criticized (Gardner, Friedman, & Jackson, 1998; Gardner, Stark, Jackson, & Friedman, 1999). Gardner et al. (1998) asserted that body size is a continuous variable, but assessment of body image using a silhouette scale entails using a discrete value based on a set of response options. Participants responding to such scales may tend to select shapes in the midrange of the scale. This may also, in part, explain high test–retest reliabilities reported for this method. Gardner et al. (1998) added that because it is relatively easy to remember the figures chosen on the previous test, it is likely that high test–retest scores would be obtained. To counter this, they suggested that presenting figures in randomized order may negate participants' ability to simply recall the figure chosen previously on the figure rating scale; however, research has not yet been conducted to test this hypothesis. Despite this recommendation, it appears that no researchers have examined the impact of a random presentation of figures from silhouette rating scales on body dissatisfaction scores. Therefore, this study was designed to examine the effect of random presentation of figures on individuals' figure ratings.

METHOD

Sample

Seventy undergraduate students (30 men and 40 women) between 18 and 43 years of age (mean age ± *SD* years = 22.1 ± 5.7) participated in this study, following ap-

proval by the college ethics committee. Participants gave informed consent to participate prior to completion of any measures and were selected randomly (every fourth student) from the roll of all psychology students studying introductory psychology modules at the college. None of the randomly selected students chose not to participate.

Procedure

Participants completed the Stunkard et al. (1983) Figure Rating Scale on two occasions approximately 2 weeks apart in a counterbalanced order. On both occasions participants completed the scales on an individual basis. On one occasion the traditional figure rating scale was administered, and on the other occasion the Stunkard et al. (1983) Figure Rating Scale figures were presented in a randomized order (figure order = 6, 9, 3, 7, 2, 1, 5, 4, 8). On both occasions participants were asked to indicate their current body shape and their ideal body shape. Body dissatisfaction was also calculated from the responses. The silhouettes included nine figures of humans ranging in body size from emaciated to obese. The respondents rated on a 9-point scale their body size, then separately, their ideal body size. Body dissatisfaction was calculated as the discrepancy between current and ideal body sizes.

Statistical Analysis

Because the ratings were ordinal data, the relationship between sequentially presented and randomly presented scales was assessed using Spearman's rank–order correlation coefficients. Wilcoxon signed-ranks tests were used to examine any differences in mean ranks between normally presented and randomly presented figure rating scales. The Statistical Package for Social Sciences (SPSS) Version 11.5 was used for all analyses.

RESULTS

Significant positive relationships were found between sequentially presented and randomly presented figure rating scales for measures of perceived current body size ($r_s = .907$, $df = 69$, $p < .01$), ideal body size ($r_s = .625$, $df = 69$, $p < .01$), and body dissatisfaction ($r_s = .672$, $df = 69$, $p < .01$) for the whole sample. Similar positive relationships were also found for each gender group (all $p < .01$). No significant differences in perceived current body shape ($T = –.380$, $df = 69$, $p > .05$), ideal body shape ($T = –1.674$, $df = 69$, $p > .05$), or body dissatisfaction ($T = –1.787$, $df = 69$, $p > .05$) were found for the whole sample and when grouped by gender (all $p > .05$) based on the Wilcoxon signed-ranks tests. Results from statistical tests and descriptive statistics for perceived current body shape, ideal body shape, and body

dissatisfaction for the whole sample are shown in Table 1. Results by gender are shown in Table 2.

DISCUSSION

Previously reported high test–retest reliability coefficients for figure rating scales used to assess body image and body dissatisfaction have suggested that the results may have been due to the sequential presentation of figures from emaciated to obese. The sequential order, from emaciated to obese, allows the participants to easily remember what they chose from test to retest. The aim of this study was to examine whether there was a difference in ratings of perceived current body shape,

TABLE 1
Means and Standard Deviations of Normal and Randomized Figure Rating Scores for the Whole Sample

	Normal Version		*Randomized Version*			
	M	*SD*	*M*	*SD*	r_s	*T*
Current body shape	4.4	1.5	4.4	1.4	.907*	–.380
Ideal body shape	3.5	0.9	3.3	1.1	.625*	–1.674
Body dissatisfaction	1.3	1.0	1.5	1.1	.672*	–1.797

*$p < .01$.

TABLE 2
Means and Standard Deviations of Normal and Randomized Figure Rating Scores for Men and Women

	Normal Version		*Randomized Version*			
	M	*SD*	*M*	*SD*	r_s	*T*
Men						
Current body shape	4.3	1.3	4.2	1.3	.901*	–.707
Ideal body shape	3.9	0.8	3.8	1.0	.667*	–1.115
Body dissatisfaction	1.2	0.9	1.3	1.1	.748*	–.775
Women						
Current body shape	4.5	1.5	4.6	1.5	.910*	–1.00
Ideal body shape	3.2	0.8	3.0	1.0	.478*	1.244
Body dissatisfaction	1.4	1.1	1.7	1.0	.604*	–1.625

*$p < .01$.

ideal body shape, or body dissatisfaction between figure rating scales when presented in a sequential and a randomized order.

The ratings of current and ideal body shape and body dissatisfaction when presented in a sequential or randomized order are similar, and randomization of silhouettes on the figure rating scales does not appear to markedly influence ratings on the figure rating scale. This finding contradicts the assertion made by Gardner et al. (1998) that high test–retest reliability previously documented for figure rating scales is due to the ease of remembering the figures initially selected when this scale is presented at retest. Gardner et al. (1999) also suggested that inflation of test–retest reliability and a damping of score variability occur when using scales such as the Stunkard et al. (1983) Figure Rating Scale due to the imposition of an ordinal scale on a continuous variable. This factor must also be considered when interpreting this study.

Further work examining this issue in other populations including children and individuals with weight disorders would be desirable. An examination of the impact of silhouette randomization on other types of figure rating scales may also be useful when determining the appropriate figure rating scales to assess body dissatisfaction.

Therefore, randomization of silhouettes on the figure rating scale does not appear to have an impact on measures of perceived current body shape, ideal body shape, or body dissatisfaction. The figure rating scale presented in a sequential order appears to be a reliable and suitable measure for assessing perceived current and ideal body shape and body dissatisfaction.

REFERENCES

Duncan, M. J., Woodfield, L. A., O'Neill, S. J., & Al-Nakeeb, Y. (2002). Relationship between body image and percent body fat among British school children. *Perceptual and Motor Skills, 94,* 197–203.

Gardner, R. M., Friedman, B. N., & Jackson, N. A. (1998). Methodological concerns when using silhouettes to measure body image. *Perceptual and Motor Skills*, *86,* 387–395.

Gardner, R. M., Stark, K., Jackson, N. A., & Friedman, B. N. (1999). Development and validation of two new scales for assessment of body image. *Perceptual and Motor Skills, 89,* 981–993.

Hart, E. A. (2000). Assessing body image. In K. Tritschler (Ed.), *Barrow & McGee's practical measurement and assessment* (pp. 409–437). Philadelphia: Lippincott, Williams & Wilkins.

Huddy, D. C., Johnson, R. L., Stone, M. H., Prolux, C. M., & Pierce, K. M. (1997). Relationship between body image and percent body fat among male and female college students enrolled in an introductory 14-week weight training course. *Perceptual and Motor Skills, 85,* 1075–1078.

Krane, V., Stiles-Shipley, J. A., Waldron, J., & Michalenok, J. (2001). Relationships among body satisfaction, social physique anxiety, and eating behaviours in female athletes and exercisers. *Journal of Sport Behaviour, 24,* 247–264.

Sherman, D. K., Iacono, W. G., & Donnelly, J. M. (1995). Development and validation of body rating scales for adolescent females. *International Journal of Eating Disorders, 18,* 327–333.

Stunkard, A. J., Sorensen, T., & Schulsinger, F. (1983). Use of the Danish adoption register for the study of obesity and thinness. In S. S. Kety, L. P. Rowland, R. L. Sidman, & S. W. Matthysse (Eds.), *The genetics of neurological and psychiatric disorders* (pp. 115–120). New York: Raven.

Thompson, J. K., & Altabe, M. N. (1991). Psychometric qualities of the Figure Rating Scale. *International Journal of Eating Disorders, 10,* 615–619.

Truby, H., & Paxton, S. J. (2002). Development of the Children's Body Image Scale. *British Journal of Clinical Psychology, 41,* 185–203.