

AN EVALUATION OF THE CONSTRUCT OF BODY IMAGE

Sophie S. Banfield and Marita P. McCabe

ABSTRACT

The two studies reported in this paper were designed to evaluate the efficacy of a multidimensional model of body image that incorporated the dimensions of perception, affect, cognition, and behavior. Study 1 selected items from established measures that were judged to reflect these four dimensions. This four-factor model was then tested in Study 2. The participants for Study 2 were 175 females. The results did not support the hypothesized four-factor model. An exploratory factor analysis revealed a model that consisted of three factors: Cognitions and Affect Regarding Body, Body Importance and Dieting Behavior, and Perceptual Body Image. Below-average-weight respondents rated the Cognitions and Affect Regarding Body factor as more important than did above-average-weight respondents. Below-average-weight respondents overestimated their body size, whereas average-weight and above-average-weight respondents made underestimates, with above-average-weight respondents underestimating their body size to a greater extent than average-weight respondents. The results highlight the multidimensionality of the body image construct and the difficulty in attempting to simplify this construct. Implications of these findings for better understanding problems among people with disturbed body image are discussed.

Although early researchers conceptualized body image as being unidimensional, it is now considered to be, and is measured as, a multidimensional construct. However, the nature of these dimensions is unclear. Examples of dimensions are: perception, attitude, cognition, behavior, affect, fear of fatness, body distortion, body dissatisfaction, cognitive-behavioral investment, evaluation, preference for thinness, and restrictive eating (Brown, Cash, & Mikulka, 1990; Cash, 1994; Cash & Green, 1986; Cash & Henry, 1995; Gleaves, Williamson, Eberenz, Sebastian, & Barker, 1995; Slade, 1994; Williamson, 1990; Williamson, Cubic, & Gleaves, 1993; Williamson, Gleaves, Watkins, & Schlundt, 1993). The way in which body image is conceptualized is not just of theoretical interest, but has implications for the way in which disturbances in body image are treated.

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The nature of the dimensions included in models of body image is diverse. Slade (1994) viewed body image as "a loose mental representation of body shape, size, and form which is influenced by a variety of historical, cultural and social, individual, and biological factors, which operate over varying time spans" (p. 302). Cash and his colleagues (Brown et al., 1990; Cash, 1994; Cash & Henry, 1995) viewed body image as being composed of perceptual and attitudinal dimensions. Gleaves et al. (1995) proposed a model that consisted of four dimensions: fear of fatness, body distortion, preference for thinness, and body dissatisfaction. These different models are reflected in measures of body image, making it difficult to compare body image findings using these different measures.

Empirical investigation is needed to determine the extent to which these models of body image accurately reflect the grouping of items. The aim of this research is to define body image more clearly and obtain data on the nature of the dimensions of body image. In doing so, it will be possible to develop a clearer idea of the actual dimensions of body image. Past conceptualizations of body image have generally incorporated at least one of the following four dimensions: perception, cognition, affect, and behavior. These four dimensions have the appealing features of being simple, functional, and clearly testable, and are the starting point for the model adopted in this paper.

Perceptual body image is defined as the accuracy of individuals' judgement of their size, shape, and weight relative to their actual proportions (Cash, Wood, Phelps, & Boyd, 1991; Slade, 1994). The study of perceptual body image involves assessing the accuracy of body size estimations, either at the level of individual body parts or the body as a whole (Cash et al., 1991). Two types of assessment procedures have been used for the measurement of perceptual body image: paper and pencil format, and body image accuracy techniques. However, the fundamental methodological problem with measures that use a paper and pencil format is that they fail to assess individuals' actual body size and therefore have no physical reference point to compare to individuals' judgement of their body size. As a result, there is no reference point or physical measurement by which to determine individuals' perceptual distortion.

Body image accuracy techniques include two types of assessment procedures—size estimation techniques (e.g., the Movable Calliper Method; Reitman & Cleveland, 1964; Slade & Russell, 1973) and distortion techniques (e.g., Askevold, 1975; Brodie, Slade, & Rose, 1989). The distorting image techniques are used more frequently, and these include the distorting mirror (Traub & Orbach, 1964), distorting photographs (Gluckman & Hirsch, 1968) and distorting video camera (Free-

man, Thomas, Solyon, & Hunter, 1984) techniques. These methods involve subjects adjusting an image of themselves until it corresponds with how they perceive their body (Brodie et al., 1989). The problem with these images is that adjustments work on the body as a whole, and it is difficult to alter the size of one part of the body independent of other parts (Monteath & McCabe, 1997).

The second two aspects of body image are the affective and cognitive dimensions. The affective dimension can be conceptualized as the feelings individuals have towards their bodies' appearance (Cash & Green, 1986). The cognitive component relates to thoughts and beliefs concerning body shape and appearance (Cash & Green, 1986). Often measures that claim to be measuring one of these components exclusively actually contain items that relate to the other dimension, or include items relating to both dimensions in the single measure. For example, items in the Body Dissatisfaction Subscale of the Eating Disorder Inventory (Garner, Olmstead, & Polivy, 1983) assess both thoughts and feelings (e.g., "I feel satisfied with the shape of my body" and "I think my hips are too big").

Support for the partitioning of the affective versus cognitive aspects of body image has come from Thompson and Psaltis (1988), who found that individuals have both a rational and affective view of their body size. Thompson and Psaltis, after modification of the Fallon and Rozin (1985) protocol, found that figural ratings were higher when respondents were instructed to base their ratings on how they feel (affective instruction), rather than what they think (cognitive instruction), about their appearance. This corresponds to other research findings (Bowden, Touyz, Rodriguez, Hensley, & Beumont, 1989; Franzen, Florin, Schneider, & Meier, 1988; Proctor & Morley, 1986).

The behavioral aspect of body image is a debatable inclusion in any model of body image, for it could be argued that it is a manifestation or a consequence of the other dimensions (Gleaves et al., 1995; Stice, Nemeroff, & Shaw, 1996). It could be argued that negative affect and cognitions lead to behavioral disturbances. However, these dimensions of body image may occur concurrently, or behavioral disturbances may lead to problems in the affective and cognitive dimensions of body image. For example, a cycle of dieting followed by failure was considered by Tiggemann (1994) to lead to negative affect and feelings of fatness. Cash and his colleagues (Brown et al., 1990; Cash, 1994; Cash & Henry, 1995) also lend support for the inclusion of the behavioral dimension in the conceptualization of body image. Their multidimensional model of attitudinal body image includes an investment component that incorporates the cognitive importance placed on body

image and the grooming behaviors used to maintain appearance (Cash, 1994). Therefore, the behavioral dimension will initially be included in the model of body image to ascertain its position within the body image construct.

There is currently no consensus within the body image literature as to the names ascribed to dimensions, and often two dimensions are given the same title. To illustrate the first problem, titles used for the affective body image dimension are: weight and shape concerns; body image dissatisfaction; body concern; body focus; negative affect; and body image attitudes. Alternately, the cognitive and affective dimensions are often grouped together under the title of body dissatisfaction (Garner et al., 1983). This confusion is largely due to the fact that there is no consensus on the dimensionality of body image or the instruments that should be used to measure this construct. This has led to difficulties in comparing the findings from various research studies.

The present study was designed to explore a model of body image that incorporated perceptual, affective, cognitive, and behavioral dimensions. The purpose was to determine if this model was the most appropriate conceptualization of body image or if an alternative model accounted more adequately for this construct. Thus, the aim of the study was not to construct a measure of body image, but to determine the validity of conceptualizing body image as comprising four dimensions: perception, affect, cognition, and behavior.

STUDY 1: METHOD

Participants

Twenty participants took part in this study—14 females and 6 males. This group was chosen because of their experience in conducting research in the field of body image, which made them familiar with the various constructs of body image.

Materials

A questionnaire consisting of 134 questions and statements concerning body image was administered to the respondents, who were required to categorize each item into a single dimension (perception, affect, cognition or behavior) according to what they believed it was assessing. These dimensions were clearly defined at the beginning of the questionnaire and on each of the subsequent pages. The definitions used to classify items were: Perceptual items: The way individuals *view* their body in relation to its actual form; Affective items: *Feelings*

individuals have about their body; Cognitive items: *Thoughts* individuals have about their body; Behavioral items: *Behaviors* that are aimed at changing the body shape of individuals.

The items contained in the questionnaire were collated from ten body image instruments and a variety of perceptual questions. The scales and subscales chosen were selected because of their good reported psychometric properties, claimed relevance to the four body image dimensions, and best representation of the instruments available. An attempt was made to obtain a range of different measures for each construct. Since these measures contain different numbers of items, a different number of items were included in the final measure for each construct. However, this would not be expected to influence the final factor structure. These items were randomly ordered in the questionnaire by assigning randomly generated numbers. The questionnaire was constructed from the following instruments, which are included under the dimension they are purported to measure.

Perceptual Measures

Since it was difficult to obtain a wide range of paper and pencil measures of perceptual body image, the number of items was limited. Perceptual measures most commonly used in the body image literature were included.

Perceptual questions (based on the Subjective Rating Index from the Body Image Detection Device; Ruff & Barrios, 1986). Fifteen perceptual questions were used; for example, "How would you describe the size of your buttocks at present? Are they larger or smaller than the average person's?" and "How much do you weigh?" Items were rated on a five-point Likert scale that ranged from (1) much larger than average, to (5) much smaller than average. Responses to each question were referenced to actual body measurement and normative data for the circumference or width of the pertinent body area to obtain a discrepancy score between actual and perceived body image.

The Body Image Assessment Procedure-Revised (BIAP-R). The BIAP-R (Keeton, Cash, & Brown, 1990) is an adaptation of the silhouette methodology originally developed by Williamson, Kelly, Davis, Ruggiero, and Blouin (1985). It consists of one question: "What figure best represents your current body shape?" Respondents are asked to indicate on a scale of 5 silhouettes (1 = thin, 5 = obese) which drawing best represents their body shape. The rating respondents give to their body shape is then compared to objective ratings made by four independent judges. The judges rate the respondents' body shape on the same five-point scale, from a standard frontal photograph.

Affective Measures

Body Esteem Scale (BES). The BES (Franzoi & Shields, 1984) is a factorially derived measure of male and female body esteem. This instrument contains questions related to 35 individual body parts and functions; for example, "How do you feel about the appearance of your buttocks?" For women, three subscales measure sexual attractiveness, weight concern, and physical condition. For men, the three subscales measure physical attractiveness, upper body strength, and physical condition. Items were rated on a five-point Likert scale from (1) have strong negative feelings, to (5) have strong positive feelings.

Ben-Tovim Walker Body Attitudes Questionnaire (BAQ). The BAQ (Ben-Tovim & Walker, 1991) was developed to assess a broad range of attitudes which women have about their bodies. This study used the Feeling Fat Subscale which consists of 12 items, with an example being, "I have a slim waist." Items are rated on a five-point Likert scale from (1) strongly agree, to (5) strongly disagree.

Multidimensional Body-Self Relations Questionnaire (MBSRQ). The MBSRQ (Brown et al., 1990; Cash, 1990; Cash, Winstead, & Janda, 1986) provides a multidimensional, attitudinal assessment of body image and weight-related variables. In this study, the Appearance Evaluation Subscale was used, consisting of seven items. An example of the items from this subscale is, "My body is sexually appealing." This subscale was designed to assess feelings of physical attractiveness and unattractiveness. Items are rated on a five-point Likert scale that assesses level of agreement from (1) definitely disagree, to (5) definitely agree.

Cognitive Measures

Eating Disorder Inventory (EDI). The EDI (Garner et al., 1983) is a self-report questionnaire designed to measure psychological and behavioral traits commonly found in eating disorders. Two subscales of the EDI were used in this study. Items from the Drive For Thinness Subscale and the Body Dissatisfaction Subscale are rated on a five-point Likert scale from (1) always, to (5) never. The Drive For Thinness Subscale assesses excessive concern with dieting, preoccupation with weight, and fear of gaining weight; it consists of seven questions, with an example being, "I am terrified of gaining weight." The Body Dissatisfaction Subscale measures dissatisfaction with overall body shape and with the size of regions of the body that are of greatest concern to individuals with eating disorders (i.e., hips, stomach, thighs) and has nine items, with an example being, "I think my thighs are too large."

Attention to Body Shape Scale (ABSS). The ABSS (Beebe, 1995) was designed to assess the abnormal degree of attention males and females

pay to body shape. The questionnaire has seven items, with an example being, "I'm very attentive to my body shape." Items are rated on a five-point Likert scale from (1) definitely agree, to (5) definitely disagree.

Behavioral Measures

The Dutch Eating Behaviors Questionnaire–Restrained Eating Subscale (DEBQ). The Restrained Eating Subscale (Herman & Mack, 1975) is a simple self-report device for identifying chronic dieters. The ten questions concentrate on concern with weight and weight fluctuations; for example, "Do you take into account your weight when you eat?" Items indicate the frequency of participation in certain behaviors and are rated on a five-point Likert scale from (1) never, to (5) very often.

Body Image Avoidance Questionnaire (BIAQ). The BIAQ (Rosen, Srebnik, Saltzberg, & Wendt, 1991) is a 19-item questionnaire that deals with avoidance of situations that provoke concern about physical appearance. An example of an item that appears on this questionnaire is, "I wear baggy clothes." Items are rated on a five-point Likert scale from (1) always, to (5) never.

Weight Loss Behavior Scale. This scale (Wertheim et al., 1992; Maude, Wertheim, Paxton, Gibbons, & Szmukler, 1993) consists of 12 items, with an example being, "How often do you fast to lose weight?" The first question asks how many diets an individual has been on in the past. The next six items assess how often an individual partakes in the extreme weight loss methods of fasting, crash dieting, vomiting, and using diet pills, laxatives, and diuretics. The last five items assess other methods of losing weight, for example smoking, counting calories, and skipping meals. Items are rated on a five-point Likert scale from (1) never, to (5) daily.

Procedure

After receiving ethics approval, questionnaires were distributed to participants. The questionnaire took approximately thirty minutes to complete and participants completed it on their own time. All items were categorized (perception, affect, cognition or behavior) according to the dimension the respondent *believed* the item was evaluating. Responses were anonymous and confidential. Participants were instructed to return the questionnaire in a stamped self-addressed envelope. All respondents who agreed to participate in the study returned the questionnaires.

STUDY 1: RESULTS

Twenty-eight items were selected for the final questionnaire (see Table 1 for items in the Body Image Questionnaire). Initially, two criteria were used for inclusion: at least 80% agreement across respon-

Table 1

Items in the Body Image Questionnaire

-
1. I think that my stomach is too big. (C)
 2. How would you describe the size of your calves at present? Are they smaller or larger than the average person's? (P)
 3. How often do you skip meals to lose weight? (B)
 4. Do you watch exactly what you eat? (B)
 5. How would you describe the size of your buttocks at present? Are they smaller or larger than the average person's? (P)
 6. I place a great deal of importance on my body shape. (C)
 7. How often do you vomit to lose weight? (B)
 8. How do you feel about the appearance of your hips? (A)
 9. How would you describe the size of your biceps at present? Are they smaller or larger than the average person's? (P)
 10. I often feel fat. (A)
 11. How do you feel about the appearance of your thighs? (A)
 12. Do you deliberately eat foods that are slimming? (B)
 13. How often do you refuse food or drink offered because you are concerned about your weight? (B)
 14. How would you describe the size of your waist at present? Is it smaller or larger than the average person's? (P)
 15. How do you feel about the appearance of your waist? (A)
 16. How would you describe the size of your thighs at present? Are they smaller or larger than the average person's? (P)
 17. How would you describe the size of your hips at present? Are they smaller or larger than the average person's? (P)
 18. I only eat fruits, vegetables and other low calorie foods. (B)
 19. I exaggerate or magnify the importance of weight. (C)
 20. I think about dieting. (C)
 21. How do you feel about your weight? (A)
 22. How do you feel about the appearance of your chest or breasts? (A)
 23. I like the shape of my buttocks. (C)
 24. How do you feel about the appearance of your figure or physique? (A)
 25. What figure best represents your current body shape? (P)
 26. I fast for a day or longer. (B)
 27. I think my hips are too big. (C)
 28. I think that my thighs are too large. (C)
-

Note. P = perception, A = affect, C = cognition, B = behavior

dents that the item be placed in a particular dimension, and that the item was one of seven with highest agreement rates for that dimension.

Perception

Fifteen of the original 134 items rated highest on the perceptual dimension. Seven out of these 15 perceptual items achieved at least 80% agreement across participants as being perceptual in nature, and were selected for inclusion in the final questionnaire.

Affect

Of the 53 items that rated highest on the affective dimension, 30 reached 80% agreement across all respondents. The seven items that were rated highest for the affective dimension were selected. One item, "I often feel fat," reached 100% agreement. Eight items reached 95% agreement, and six of these were chosen for inclusion in the questionnaire. The two items which were excluded referred to feelings individuals have about their chin and ears, which were deemed to be less relevant than other items to the present experiment.

Cognition

None of the 18 questions that were rated highly in the cognitive dimension reached the 80% level of agreement across all respondents as belonging to the cognitive dimension. The seven questions with the highest consensus were chosen, whose percentage agreement ranged from 60% to 70%. It was acknowledged that this may indicate that cognition is not a dimension of body image. However, it was decided to retain cognition so as to confirm or disconfirm its inclusion in the model of body image, using a confirmatory factor analysis in Study 2.

Behavior

Thirty of the 46 questions that rated highly on the behavioral dimension reached the 80% agreement criterion. One question reached 100% agreement across respondents. This was, "I only eat fruits, vegetables, and other low calorie foods." Sixteen questions reached a 95% agreement level, of which six were randomly selected to be placed in the final questionnaire. If questions were selected that were too similar, another question was randomly chosen as a replacement.

STUDY 2: METHOD

Participants

The participants were 175 female volunteers recruited from social and sporting clubs and first-year psychology students from a large metropolitan university. The respondents were largely drawn from the middle socioeconomic class and were from an Anglo-Saxon background. The ages of participants ranged from 18 to 51 years ($M = 21.30$, $SD = 6.05$).

Materials

It should be noted that the items included in the questionnaire represented those that were rated by experts in the field as best evaluating the four constructs of body image: perception, affect, cognition, and behavior.

The Body Image Questionnaire developed from Study 1 was completed by respondents, who were also asked to provide demographic data, such as age, height, and weight. Body Mass Index (BMI) was calculated, and respondents were then divided into three body weight levels: above-average-weight, average-weight, and below-average-weight. Respondents were classified as above-average-weight if they were more than half a standard deviation above the mean weight; they were classified as below-average-weight if they were more than half a standard deviation below the mean weight. This method of classification was used, rather than any objective standard, to ensure equality of group numbers for statistical analyses.

Procedure

After receiving ethics approval, advertisements describing the nature and purpose of the study were placed on the student notice boards at a large metropolitan university. Other respondents were recruited via sporting and social clubs, where the purpose and requirements of the experiment were explained verbally.

After the questionnaire was completed, body measurements were taken of respondents' waist, hips, and shoulders. To ensure that accurate and anatomically correct measurements were recorded, the procedures described by Ross and Marfell-Jones (1991) were followed. Their descriptions are in accordance with the International Society for the Advancement of Kinanthropometry (ISAK).

Two standard frontal photographs were then taken of each respondent from the shoulders down to preserve anonymity. Photographs were taken with a 35mm SLR camera, using an 80mm lens and attached flash. The camera was mounted on a tripod, at six feet from

the subject, and the lens at approximately mid stature. Commercially developed standard color print film (ASA 400) was used. The entire procedure took approximately 30 minutes to complete.

STUDY 2: RESULTS

Three items were found to be highly skewed and were dropped from the confirmatory factor analysis (3, 7, 26) as recommended by Tabachnick and Fidell (1996).

Each proposed factor was analyzed separately in a one-factor confirmatory factor analysis. This was to improve each factor by deleting those variables that were reducing the solution. Any variable that had a low lambda and had a theta delta value significantly greater than its squared multiple correlation was removed from the analysis. Items 9 and 25 were removed from the original seven perceptual questions; Items 8, 15, and 22 were removed from the original seven affective questions; Items 1, 6, and 19 were removed from the original seven cognitive questions; none of the items from the original behavioral questions were removed.

Once each factor had been examined separately, the four-factor model of body image was tested. The factor loadings are shown in Table 2. Although each individual factor was found to be reliable separately, when placed together in a four-factor model the result did not adequately explain the body image construct. Also, the correlation between the affective and cognitive factors was approaching singularity ($r = .97$) (see Table 2).

A three-factor model was then tested which included an attitudinal factor (combination of the cognitive and affective factors), behavioral factor, and perceptual factor. This model was equivalent to the four-factor model, as the χ^2 change was not significant, $\chi^2(3) = 4.24, p > .05$ (see Table 3). A two-factor model was also tested, which combined the affective, cognitive, and perceptual dimensions, with the second factor being behavior. The affective/cognitive factor was combined with the perceptual factor because of the high correlation between them ($r = .68$). This model was much worse than either the four- or the three-factor model (see Table 3).

It was apparent that all of these models failed to adequately account for the underlying dimensions. Therefore, an exploratory analysis was conducted to ascertain which model would best describe the relationship between the variables. All items that were deleted during the confirmatory factor analysis were re-entered into the exploratory factor analysis, except those excluded for extreme skewness (Items 3, 7, 26).

Table 2

Factor Loadings, Correlations, Theta Delta and Squared Multiple Correlations for the Body Image Dimensions of Cognition, Affect, Perception and Behavior

| | Cognition | Affect | Perception | Behavior | Theta Delta | Squared Multiple Correlation |
|---------|-----------|--------|------------|----------|-------------|------------------------------|
| Item 20 | .69 | | | | .42 | .54 |
| Item 23 | .61 | | | | .45 | .45 |
| Item 27 | .73 | | | | .37 | .59 |
| Item 28 | .77 | | | | .29 | .67 |
| Item 10 | | .75 | | | .33 | .64 |
| Item 11 | | .72 | | | .34 | .60 |
| Item 21 | | .78 | | | .29 | .68 |
| Item 24 | | .71 | | | .38 | .57 |
| Item 2 | | | .72 | | .42 | .56 |
| Item 5 | | | .87 | | .20 | .79 |
| Item 14 | | | .78 | | .35 | .64 |
| Item 16 | | | .85 | | .24 | .76 |
| Item 17 | | | .88 | | .18 | .81 |
| Item 4 | | | | .75 | .34 | .62 |
| Item 12 | | | | .84 | .19 | .79 |
| Item 13 | | | | .84 | .20 | .78 |
| Item 18 | | | | .52 | .60 | .31 |

Factor Correlation Matrix

| | | | | |
|------------|------|------|------|---|
| Cognition | - | | | |
| Affect | .97 | - | | |
| Perception | .65 | .67 | - | |
| Behavior | -.57 | -.51 | -.29 | - |

Table 3

Chi-Square Values for the Four-Factor, Three-Factor and Two-Factor Models of Body Image, Along with the Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI), Tucker Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximations (RMSEA)

| | χ^2 | <i>df</i> | GFI | AGFI | NFI | TLI | CFI | RMSEA |
|--------------------|----------|-----------|-----|------|-----|-----|-----|-------|
| Four-factor model | 506.72 | 146 | .75 | .67 | .80 | .82 | .85 | .119 |
| Three-factor model | 510.96 | 149 | .75 | .68 | .80 | .83 | .85 | .118 |
| Two-factor model | 860.50 | 151 | .59 | .49 | .67 | .67 | .70 | .164 |

A maximum likelihood factor analysis with oblique rotation ($\delta = 0.0$) was performed on these 25 items. Prior to analysis, the factorability of R was determined to ensure that all variables would load significantly on the factors extracted. This was achieved by examining the correlation matrix. All items correlated in excess of .30 with at least one other item. This confirmation of the factorability of R was validated by the results of the Kaiser-Meyer-Olkin measure of sampling adequacy, which was found to be sufficient at .85. Tabachnick and Fidell (1996) suggested that a value of .6 is necessary for a good factor analysis.

An initial maximum likelihood analysis was conducted to estimate the number of factors present among the items. The minimal eigenvalue for a factor was set at 1.0 and was based on examination of the scree test. The criterion level for factor loading was set at .40. Maximum likelihood analysis initially extracted seven factors. However, the scree test indicated that three to four factors were present. Furthermore only four factors explained more than five percent of the variance each. A three-factor model was found to best represent the data. A number of items were removed from this model. Item 25 was removed due to its failure to load in excess of .40 on any of the factors, and Items 1 and 22 were deleted after reliability analysis revealed that their removal would improve the factor solution.

Twenty-two items were entered into the final analysis, which revealed that three factors, accounting for 48.89% of the variance, most accurately represented the underlying dimensions present. There were no multiple loadings on any item in the three factors. Interfactor correlations ranged from .22 to $-.41$. Table 4 shows an item factor table from the rotated pattern matrix. It also displays, for each factor, the percentage of variance explained, eigenvalue, and reliability, along with a factor correlation matrix.

Factor 1 accounted for 18.98% of the variance and was composed of nine items. Termed Cognitions and Affect Regarding Body, this factor related to individuals' thoughts and feelings concerning their lower body, including their hips, thighs, and buttocks, and their physique as a whole. These thoughts and feelings regarding the lower body were related to attitudes toward overall physique. The item loadings on this factor ranged from .40 to .82, and its internal reliability was .92.

Factor 2 accounted for 13.82% of the variance and consisted of seven items. Termed Body Importance and Dieting Behavior, this factor was concerned with the importance individuals' place on their body image and the dieting behaviors in which they participate to obtain or maintain their body shape. Item loadings on this factor ranged from $-.56$ to .87, and its internal reliability was .88.

Table 4

Factor Table from the Rotated Pattern Matrix, Along with the Percentage of Variance Explained, Eigenvalue and Reliability for Each Factor, and Factor Correlation Matrix

| | Cognitions and Affect | Body Importance | Perceptual Body Image |
|----------------------------------|--------------------------|--------------------|--------------------------|
| Item 11 | .82 | -.01 | -.02 |
| Item 23 | .73 | -.10 | .01 |
| Item 28 | .72 | -.17 | -.01 |
| Item 8 | .64 | -.02 | -.03 |
| Item 27 | .61 | -.14 | -.15 |
| Item 24 | .55 | -.12 | -.26 |
| Item 21 | .51 | -.25 | -.28 |
| Item 10 | .47 | .35 | .24 |
| Item 15 | .40 | -.04 | -.33 |
| Item 12 | .05 | .87 | .07 |
| Item 13 | -.07 | .80 | .09 |
| Item 4 | .05 | .75 | .04 |
| Item 19 | .14 | .66 | .08 |
| Item 6 | -.07 | .63 | -.24 |
| Item 20 | .30 | .63 | -.15 |
| Item 18 | -.09 | -.56 | -.04 |
| Item 14 | .00 | .01 | -.87 |
| Item 17 | .16 | .03 | -.84 |
| Item 9 | -.04 | -.03 | -.73 |
| Item 5 | .29 | .03 | -.71 |
| Item 2 | .12 | .11 | -.70 |
| Item 16 | .32 | .04 | -.69 |
| Variance explained | 18.98% | 13.82% | 16.08% |
| Eigenvalue | 4.75 | 3.46 | 4.02 |
| Reliability | .92 | .88 | .92 |
| <i>Factor Correlation Matrix</i> | | | |
| Cognitions and Affect | - | | |
| Regarding Body | | | |
| Body Importance and Dieting | -.35 | - | |
| Behavior | | | |
| Perceptual Body Image | -.41 | .22 | - |

Factor 3 accounted for 16.08% of the variance, with six items loading on it. Termed Perceptual Body Image, this factor reflected individuals' perceptual distortions for particular body parts. The loadings of items on this factor ranged from $-.69$ to $-.87$, and its reliability was $.92$.

The three factors extracted from the exploratory factor analysis were utilized in a MANOVA to determine the influence of body weight on these dimensions. The group sizes were relatively equal for the independent variable of body weight (below-average-weight = 38, average-weight = 34, above-average-weight = 28). The means and standard deviations for the factor score for each body weight level are shown in Table 5.

A significant multivariate effect was found for the influence of the three levels of body weight (below-average-weight, average-weight, and above-average weight) on the dependent variables, using a Pillais criterion, $F(6, 186) = 15.24, p < .001$. The ANOVAs performed on each of the three body image factors revealed significant effects for Cognitions and Affect Regarding Body, $F(2, 94) = 5.36, p < .01$, and Perceptual Body Image, $F(2, 94) = 66.63, p < .001$.

Post hoc Scheffé tests for Perceptual Body Image revealed that below-average-weight individuals overestimated the size of discrete body areas, whereas average-weight and above-average-weight individuals underestimated their body size. Above-average-weight individuals underestimated their body size to a greater extent than average-weight individuals. Above-average-weight individuals were found to be more negative on the Cognitions and Affect Regarding Body factor than were

Table 5

Means and Standard Deviations (by Body Weight) for Cognitions and Affect Regarding Body, Body Importance and Dieting Behavior, and Perceptual Body Image

| | Body Weight | | | | | |
|--------------------------------------|---------------|-----------|----------|-----------|---------------|-----------|
| | Below Average | | Average | | Above Average | |
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| Cognitions and Affect Regarding Body | 32.32 | 8.61 | 28.24 | 7.67 | 27.11 | 7.64 |
| Body Importance and Dieting Behavior | 16.29 | 5.42 | 19.50 | 6.33 | 16.79 | 4.52 |
| Perceptual Body Image | 41.53 | 7.46 | 30.97 | 4.31 | 24.71 | 5.54 |

below-average-weight individuals. There was no difference in responses of participants in the three body weights for the Body Importance and Dieting Behavior factor.

GENERAL DISCUSSION

These studies were designed to evaluate the validity of a four-dimensional model of body image. This model consisted of perception, affect, cognition, and behavior. The confirmatory factor analysis revealed that the four-factor model was not an adequate conceptualization of the body image construct. The preferred model, obtained through exploratory factor analysis, revealed that there were three underlying body image factors: Cognitions and Affect Regarding Body, Body Importance and Dieting Behavior, and Perceptual Body Image. This result appears to contrast with that of Thompson, Altabe, Johnson, and Stormer (1994), who found two factors (General Body Dissatisfaction, Cognitive Aspects of Dissatisfaction) for an adolescent population, but only one factor (General Body Dissatisfaction) for a college population. However, Thompson et al.'s (1994) study primarily focused on affective and cognitive measures of body dissatisfaction, and did not contain scales which evaluated the behavioral and perceptual dimensions. Therefore, the first factor in this study is largely consistent with Thompson et al.'s (1994) findings.

The three factors that made up the final model gain some support from previous conceptualizations of body image (Brown et al., 1990; Ben-Tovim & Walker, 1991; Cash, 1994). Brown et al. (1990) evaluated the factor structure of the Body-Self Relations Questionnaire, and found that the items formed seven separate factors. The two factors that are relevant to the present study of body image were Appearance Evaluation and Appearance Orientation, which are completely consistent with the first two factors in the current study. The Cognitions and Affect Regarding Body factor is also consistent with the items included in the Lower Body Fatness Subscale of the Body Attitudes Questionnaire (BAQ) developed by Ben-Tovim and Walker (1991). Items in the BAQ subscale and the current dimension of cognitions and affect relate to the feelings of individuals towards the fatness of their lower body, including hips, thighs, and buttocks, and their figure as a whole. This dissatisfaction focused on the lower body, and it would appear that dissatisfaction in this area has important consequences for how individuals view their overall physique. Of course, this factor analysis was conducted on females; males who present with body dissatisfaction may focus on other parts of their body.

The Body Importance and Dieting Behavior factor is similar to Brown et al.'s (1990) investment dimension. The difference between the two is that grooming behaviors were the focus of the investment dimension, while dieting behaviors were the focus of the current factor. This result suggests that individuals who focus on body shape and appearance are more likely to participate in behaviors associated with dieting and grooming. Rucker and Cash (1992) proposed that those who internalize the cultural standard of shape and apply this standard to their body image experiences in essence are using a "self-evaluation goodness of fit" test (p. 292). Individuals then adjust their dieting, exercising, and grooming behaviors to manage the discrepancy between the cultural ideal and their body image experiences.

These results demonstrate that importance of body size may be a component of body image that should be considered more closely in research studies. It would appear that the level of importance placed on body shape influences individuals' reaction to their self-ideal discrepancy and the degree to which they engage in body image related behaviors. This aspect of body image is often neglected in the research, but has important implications for therapy with clients with disturbed body image. The extent to which importance of body image is associated with disordered eating within a clinical population requires further investigation so that treatment programs can, if necessary, be modified to include this factor.

The Perceptual Body Image factor produced interesting findings. The perceptual question that asked respondents to indicate the figure that best represented their current figure did not load with the other perceptual questions which addressed perceptual distortion at the level of individual body parts. Subsequently, this question was dropped from the analysis. This finding may have a number of explanations. First, perceptual distortion of discrete body areas does not relate to perceptual distortion of the figure as a whole, which may indicate that perceptual body image is a multidimensional construct (McCrea, Summerfield & Rosen, 1982). Second, the two techniques for measuring perceptual distortion may be measuring different body image dimensions. This is certainly supported by the research of Monteath and McCabe (1997). Lastly, the paper and pencil Perceptual Body Image procedure developed in the current study may not be a true measure of perceptual distortion. Examination of the construct validity of this measure by determining its intercorrelation with other measures of perceptual body image is required (Gleghorn et al., 1987).

Above-average-weight individuals were found to have more negative thoughts and feelings concerning their bodies than below-average-weight individuals. This finding is consistent with previous research

on body dissatisfaction conducted for both males and females (Cash & Green, 1986; Gray, 1977). Berscheid, Walster, and Bohrnstedt (1973) found that dissatisfaction with weight-related aspects of one's body was a predictor of dissatisfaction with the body as a whole. The stigma society places on being overweight may create an awareness of fatness in those individuals who deviate from the thin ideal. Thus, the further a female deviates from this ideal, in the direction of becoming heavier, the more dissatisfied she becomes. This finding is not surprising and demonstrates the strong relationship between weight and body dissatisfaction, and the need to address satisfaction with body as well as weight-change behaviors with clinical clients. Whether this same relationship exists for males requires further investigation.

Below-average-weight respondents overestimated the size of discrete body areas, whereas average-weight and above-average-weight respondents underestimated these areas. The degree to which below-average-weight and average-weight respondents distorted discrete body areas was equal but in opposite directions. Also, it was found that above-average-weight individuals underestimated their body size to a greater extent than did those of average weight. It appears that individuals' perceptual distortion has the effect of bringing them closer to perceived normality (Gray, 1977; Gustavson et al., 1990). Whether this also applies to clinical populations requires further investigation.

Future research is required to determine whether the three-factor structure of body image identified here also applies to males. Such research needs to be conducted to define male body image more precisely, and assess how it differs from the dimensions of female body image. It is also necessary to replicate the present study with a clinical population to determine if these same factors apply to respondents with high levels of body dissatisfaction and with disordered eating.

The model of body image defined in this study adds new insight into the construct of body image. It is now evident that not only should each body image factor be considered as multidimensional, but so should the items that form these factors. The initial four-factor model posed by this study was an oversimplification of the complex nature of body image. The final three-factor model proposed here lends support to aspects of other body image models. However, this model needs to be further explored with a more diverse population to determine its validity with males and also with clinical populations.

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