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Body Image: A Cognitive Self-Schema Construct?[1]

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Body image has been a useful construct for understanding eating disorders. In that capacity, body image has been defined in many ways: One concept of body image is as an internalized view of one's appearance that drives behavior and influences information processing. This cognitive schema definition of body image was tested in a series of studies. Other recent studies have investigated cognitive processes with body image information, but they have focused on weight-related body image. A combination of Higgins' self-discrepancy theory and Markus' self-schema theory were used to describe a modern interpretation of body image as an internalized self-representation. Both of these theories predict specific information processing consequences of an organized cognitive representation. In turn, these consequences confirm the existence of that representation. Several studies were conducted to test a specific schema-like view of body image. In Study 1 body image schema variables were correlated with traditional measures of body image. In Study 2 subjects exposed to schema relevant contents showed information processing consequences consistent with self-representation theory. Finally, in Study 3 instructional set was shown to modify the schema activation effect. These effects give evidence of body image schema and yield limited information about the nature of that representation.

KEY WORDS: body image; self-schema.

Body image has been a focus of intensive research in recent years (Pruzinsky & Cash, 1990). It has been a useful construct for understanding eating

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disorders, as well as a distress over appearance which affects many people. Through this period of body image research, the term *body image* has sometimes been used a category for several different constructs. For example, in their 1987 review Cash and Brown described affective, behavioral and cognitive components of body image. Others have used the term *body image* to mean an internal representation of an individuals' own physical appearance (Garner & Garfinkel, 1981).

This latter definition harkens back to the Gestaltists who studied neurological phenomenon such as phantom limb syndrome (Kohler, 1947; Schilder, 1950). Through their observations of neurological patients, they came to believe there was a mental representation of body information. Thus, they originated the concept body image. Since that time body image has often been used to mean an internal mental representation. However, little empirical data exist to support this cognitive view of body image. It could simply be that *body image* is a useful umbrella term for several physical appearance-related variables.

However, if it could be shown that body image is a mental representation, much new information could be applied to body image. Mental representations of self-related information, sometimes called self-schema, have been studied extensively in the literature (e.g., Sherman, Judd, & Park, 1989). Much has been learned about the representation of the self and how it operates in response to the environment. For example, the self is said to enhance encoding of self-related information and affect the interpretation of events in the world. Moreover, self-schema has been useful in understanding clinical disorders such as depression. For example it attributes relapses in depression to persistent cognitive vulnerabilities (Segal, 1988). Most importantly, the cognitive model has led to an effective therapeutic intervention in the form of cognitive therapy. Thus it would be useful to know the applicability of this cognitive self-schema paradigm to body image.

Application of Schema Concepts to Body Image

Before we begin a review of cognitive studies in body image, it is important to clarify terms and how they are used. We are trying to operationalize in modern terms what the Gestaltists meant by body image; a mental representation of information. This fits how some researchers have used the term *schema*. Others have argued that a schema is a specific type of cognitive organization that requires empirical validation of specific properties. In these studies we mean the more general definition of schema: a mental representation of information with processing consequences.

Some body image researchers have already used the cognitive paradigm to better understand body image. Vitousek and Hollon (1990) argued that disturbed cognitions are the core psychopathology in eating disorders. They hypothesized anorexics and bulimics build up a dense associative mental network between body weight and personal values such as self-control.

Similarly, Garner and Garfinkel (1981) explained the body image disturbance of those with eating disorders by viewing body image as a medium of self-esteem concerns. Schlundt and Johnson (1990) also investigated the cognitive structure of body image. They defined body image as the mental image each person has of what his or her body looks like.

Several researchers have empirically tested cognitive views of body image phenomenon. Some researchers have related general self-related cognitions to eating disorders pathology (Forston & Staunton, 1992; Strauman, Vookles, Berenstein, Chaiken, & Higgins, 1991). Other studies have investigated whether cognitive processes occur with weight-related information (Cooper & Fairburn, 1992; Long, Hinton, & Gillespie, 1994; Perpina, Hemsley, Treasure, & deSilva, 1993). These studies used the Stroop paradigm to investigate weight-related information processing. Also investigating weight-related processing, Strauman and Glenberg (1994) related level of body image disturbance to decision processes in a single detection paradigm using body figures of different sizes. Fewer studies have investigated whether individualized body image information itself forms a self-structure with information processing consequences.

In another study of cognitive processing in weight-related body image, Markus, Hamill, and Sentis (1987) attempted to apply Markus' (1977) self-schema theory to weight issues. One property of this self-schema is increased recall of schema-relevant information as a result of more elaborate encoding. Other properties include increased behavioral prediction in the schematic domain and resistance to counterschematic information. Markus' (1977) operational definition of self-schema consisted of traits on which subjects rated themselves most extremely and considered important. The special schematic status of these traits is evidenced by faster and more consistent processing of self-schema relevant information than nonschematic (aschematic) information.

The paradigm used to obtain evidence of self-schemas is called a me/not me task. This task involves deciding as quickly as possible if stimuli are self-like or not self-like. With regard to body weight schema, Markus et al. (1987) found that subjects schematic for body weight responded more quickly to body silhouettes in the me/not me task, thus confirming subjects' schematic status. However, subjects' responses to other types of weight-related stimuli were inconsistent, limiting the overall validity of the study.

The logic of applying cognitive schema principles to body image has been established by the authors cited above. Markus et al. (1987) provided

some evidence to support the idea that body image acts like a schema in the way she defined it. Others have shown that representations of body weight information have processing consequences. More empirical study is necessary to support the view that body image acts like a schema, especially regarding subjective non-weight-related body information.

Proposed Type of Body Image Self-Representation

The cognitive structure of the self has been defined in a number of different ways. Body image may resemble any one of these. A single conceptualization of body image schema is represented in the present series of studies. This conceptualization of body image is an integration of studies Higgins (1987) self-discrepancy paradigm (described below) and Markus' (1977) self-schema theory (described above).

According to Higgins' self-discrepancy theory, an individual's self-concept consists of many self-beliefs. These self-beliefs are organized to the actual self, the ideal self, and other selves. These selves can be viewed from multiple perspectives within the individual's own self-perception. For example, there is an actual self from an individual's own perspective, as well as an actual self from an individual's perception of peer judgments about the self. Discrepancies between these different components of the self have been shown to relate to negative emotions. For example, an actual–ideal discrepancy from one's perspective has been shown to cause depressive affect (Strauman & Higgins, 1987). A central tenet of self-discrepancy theory is that specific discrepancies cause specific types of emotions. This processing effect of self-discrepancy is similar to what some people experience regarding their appearance. Specifically, a self-discrepancy may be akin to the distress people experience as a result of not reaching their body image ideal. Many researchers have claimed that body image distress results from what could be described as a discrepancy between actual appearance and cultural standards for beauty (Garner & Garfinkel, 1981). Thus, the Higgins' self-discrepancy theory may be particularly applicable to body image.

A property of self-schema described by several authors is enhanced recall of schema-relevant information (Rogers, Kuiper, & Kirker, 1977; Sherman et al., 1989). These authors have shown that self-related material is recalled better than non-self-relevant material. Thus, an additional property of body image schema is that schema-related material would be recalled best. Markus incorporated this property into her view of self-schema theory. As described above, in her view the self-schema consists of traits which a person rates as relevant and important. The schematic status of these traits results in better encoding of schema-relevant information.

One integration of these views for body image is that appearance traits for which an individual has a discrepancy are potential emotional triggers. These discrepancies may include traits individuals wish they had more or less of, or traits which individuals lack which they wish they had. However, the importance of that appearance discrepancy to the individual (a la Markus) modifies the potency of the discrepancy. Discrepancies may have increased processing consequences if the appearance domain is important or if having that specific trait is important for the individual. Thus, the body image schema acts like both a self-discrepancy, and more generally a self-schema. Finally, physical appearance information should remain relatively stable in memory.

Conclusion and Hypotheses

Thus the following hypotheses are offered to test the body image schema model proposed above. First, it is hypothesized that the body image representation will resemble a self-schema or a form of self-discrepancy. Measures of this body image schema should be related to more traditional measures of body image. It follows that the appearance discrepancies have information processing consequences. They will be activated by schema relevant emotional triggers. Emotions will be aroused which correspond to that discrepancy. As a result body image schema will act as a memory cue. Finally, processing effects will be strongest for those for whom appearance issues are more important or an area of distress.

STUDY 1

The first study was designed to test whether physical appearance discrepancy, a measure of body image schema, was related to traditional measures of body image. The relationship between discrepancies and mood were also determined as a validity check. Recall that Higgins hypothesized that specific types of discrepancies are related to specific emotions.

Method

Subjects

One hundred seventeen female undergraduates participated in this study in exchange for extra credit points. The mean age was 20.66 years, and the range was 18 to 41 years.

Materials

Physical Appearance Selves Questionnaire. A modification of the Selves Questionnaire for evaluating self-discrepancies (Strauman & Higgins, 1987) was used in this study. The instructions for the Selves Questionnaire were modified from the original to elicit only physical appearance-related responses. The use of the term *appearance* as opposed to *physical self* was used in this study to eliminate responses such as *agility*. Although this is a physical trait, it is not a characteristic of the appearance-related body image that is the focus of this study. The version of the Selves Questionnaire described here will be referred to a the Physical Appearance Discrepancy Questionnaire (PADQ).

The appearance discrepancies were determined from the PADQ in the following way. Subjects responded to an open-ended questionnaire which asked them to list traits associated with their actual appearance, own ideal appearance, own ought (or should) appearance, and cultural ideal appearance and cultural ought appearance. For each trait on each list, subjects are asked to rate the extent to which that trait applies, from *slightly* (1) to *very much so* (4). Discrepancy scores were determined by comparing two lists (scoring criteria similar to Strauman & Higgins, 1987). For this experiment four discrepancies were determined: (1) own actual versus own ideal; (2) own actual versus own ought; (3) own actual versus cultural ideal; (4) own actual versus cultural ought.

Body Image Measures. Subjects were administered the Body Dissatisfaction scale of the Eating Disorders Inventory (Garner, Olmstead, & Polivy, 1983). This is a nine-item scale in which subjects indicate their degree of dissatisfaction with several body sites. The internal consistency (Cronbach's alpha) for normal controls is .91.

Subjects were also administered the Physical Appearance State and Trait Anxiety Scale—State Form (State-PASTAS; Reed, Thompson, Grannick, & Sacco, 1991). This scale assesses the level of anxiety subjects experience about body sites (both weight and non-weight related). Both the state and trait versions were administered to subjects in Study 1. The internal consistencies range from .82 to .88 for the trait scale, and from .82 to .92 for the state scale. Test–retest reliability is .87 after 2 weeks.

Subjects were also administered the Figure Rating Scale (Strunkard, Sorenson, & Schlusinger, 1983). This measure consists of nine silhouettes ranging in size from very thin to very heavy. Subjects were instructed to "pick the figure that best represents how you *feel* you look most of the time." they were also asked to pick the figure that matched what they *thought* they looked like. In addition they were asked to select the figure that best represented their own ideal and their belief about the ideal that

most males and females hold, i.e., the cultural ideal. Finally, figure rating discrepancies scores were calculated for feel–ideal discrepancies and think–ideal discrepancies by subtracting the numeric values which correspond to each weight ideal. Test–retest coefficients for the current size are .83 (feel) and .89 (think). For own ideal, the reliabilities are .71 for females (Thompson & Altabe, 1991).

Mood Measures. The mood measure in this study was the Multiple Affect Adjective Checklist—Revised, Today Form (MAACL-R; Lubin et al., 1986). With this measure, subjects are asked to report their current mood by indicating which of 132 mood adjectives is self-descriptive. Five subscales can be scored from their responses: Anxiety, Depression, Hostility (anger), Positive Affect, and Sensation Seeking. The Depression and Anxiety scales were used in this study. For college students, the internal consistencies (Cronbach's alphas) of the Today Form of the Anxiety scale range from .74 to .80. For the Depression scale the internal consistencies range from .75 to .82. Validity of the scales were supported by correlations with self-ratings. For example, the Depression scale correlated .60 with self-ratings of sadness, but only .18 with self-ratings of anxiety.

Procedure

Subjects were administered a packet of questionnaires in their undergraduate classes. This packet consisted of the Physical Appearance Selves Questionnaire, the body image measures, and MAACL-R scales.

Results

Correlational analyses were performed on the actual–own ideal and actual–own ought discrepancies, body image, and mood measures. The following significant relationships were found. Actual–own ideal discrepancy was significantly correlated with body image anxiety (Pearson's $r = .22$, $p < .05$) and with body dissatisfaction ($r = .21, p < .05$). Actual–own ideal discrepancy was also positively correlated with *think* and *feel* figure ratings, $r = .30$ and $r = .25, p < .01$, respectively. Actual–own ideal appearance discrepancy was also significantly correlated with the *ideal for women* versus *think* figure rating discrepancy ($r = .24, p < .01$).

Actual–own ideal discrepancy was also significantly related to depression level $r = .26, p < .01$. No other significant relationships between discrepancies and body image and mood measures were found. Thus, it appears that the actual–ideal appearance discrepancies were related to other measures of body image and mood in the positive direction. However,

ables. The positive scale is half as long and the two scales correlate highly. Internal consistencies for college females were .90 for the positive subscale (Brown, Johnson, Bergeron, Keeton, & Cash, 1988).

The mood measures were given before the body image measures because the body image questions could have mood-inducing properties. The measures were chosen to effectively assess the consequences of schema activation.

Procedure

Subjects were administered the PADQ in psychology classes. Four to six weeks later they were brought into the laboratory to complete the study.

Subjects began by rating the importance of their appearance to their self-esteem in a Likert format on a scale from 1 to 11. They were divided into two groups based on their ratings: those who rated importance as 8 or less and those who rated importance as 9 to 11 (low and high appearance importance groups, respectively). They completed premeasures of anxiety and depression. They were then assigned alternatively to one of three groups: body-relevant/self-relevant prime, body-relevant/non-self-relevant control group, and non-body-relevant/non-self-relevant control group to be described below. These groups were referred to as self-relevant, body control, and nonbody control groups, respectively.

Subjects were then told the following deception: "In this study we are trying to understand how people react to the appearance traits of other people. You will be asked to complete ten sentences which begin with the form: 'A woman with . . .' You may complete the sentence any way you wish. Please complete at least two to four sentences for each stem."

All subjects were asked to complete 10 sentence stems. Subjects were given one of three types of sentence stems. One third of subjects, assigned to the body relevant/non-self-relevant condition received stems of the form "A woman with [adjective] [feature] . . ." One of these stems was "A women with smooth elbows . . ." These traits were selected based on the criteria that none of the 117 subjects in Study 1 had indicated any discrepancy related to that trait. Another third of the subjects were assigned the non-body-relevant/non-self-relevant condition. In this condition the stems for the body-relevant/non-self-relevant condition were repeated, except that objects were substituted for body features. For example, "A woman with smooth elbows . . ." became "A woman with a smooth driveway . . ." Finally, in the body-relevant/self-relevant condition, self-relevant stems were substituted for four out of the 10 body-relevant/non-self-relevant stems. Specifically, on trials 4, 6, 8, and 10 the stems were "A woman with [body-

relevant/self-relevant ideal trait] . . ." For some women a stem might be "A woman with a flat stomach . . ." These traits were selected primarily from the own ideal discrepancy list, with a few from the cultural ideal discrepancy list. Subjects were given 1 min to complete the sentence stem in as many ways possible.

Following the timed sentence task, all subjects received the revised MAACL-R, state-PASTAS, and Body Image Automatic Thoughts Questionnaire in that order. The mood measures were presented first so subjects' moods would not be affected by completing the body image questionnaires which contained body image statements. Then, in a surprise memory test, they were asked to recall as many sentence stems as they could. Recall was defined as the number of relevant items recalled. As described above, only four out of 10 trials contained self-relevant information. Thus for body-related/self-relevant subjects, the number of these self-relevant traits recalled was the dependent measure. For the other two groups, the dependent measure was the number of items recalled that were in the same position in the series as for the self-relevant group. Thus the range of scores was 0 to 4. Finally, the subjects were debriefed and thanked.

Results

Several analyses were conducted on the data collected for this study. First a 2 (High vs. Low Importance) × (Self-Relevant, Body-Control, Non-body-Control Conditions) analysis of variance (ANOVA) was conducted on the body image measures and number of items recalled. A significant effect was found for condition with self-relevant items recalled best [$F(2, 52) = 11.28, p < .01$]. Means for the three groups were 3.50, 2.95, and 2.24, respectively (Fisher's Least Significant Difference (LSD) = 0.51). No effects were found for the body image distress measures.

A 3 (Condition) × 2 (Level of Importance) × 2 [Time (Pre vs. Post)] ANOVA was conducted on the modified MAACL-R (Depression and Anxiety scale) mood measure. There was a main effect for time, $F(1, 58) = 7.26, p < .01$. In general, subjects showed less depression following the experimental manipulation. However, a significant three-way interaction emerged [$F(2, 58) = 3.45, p < .05$) (see Fig. 1). There were large pretest differences in mood, indicative of much variability among the subjects. Thus *post hoc* analysis focused on within subject changes in mood (Fisher's LSD was 1.62 for the within-subjects comparison). As can be seen from the figure, five out of six groups tended to have a decline in depressive affect from pretest to posttest, whereas the high-importance/body image-

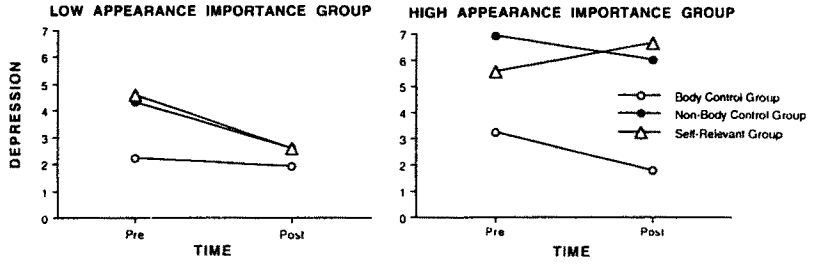

Fig. 1. Change in state depression following experimental manipulation in and low appearance importance groups assigned to prime, body-relevant, and non-body-relevant groups.

relevant group showed no change. However, Fisher's and Tukey's *post hoc* analyses for this interaction were nonsignificant.

An alternative way of viewing this effect is by comparing the group hypothesized to experience the most schema activation to those hypothesized to experience less or no activation. Specifically, this involves comparing the high-importance group who received body image-relevant primes to high-importance subjects who received neutral primes and low-importance subjects who received both kinds of primes. A 2 (Self-Relevant Prime Group vs. Control Groups) × 2 (Pre- vs. Posttest ANOVA) was conducted on the MAACL-R Depression subscale. A significant interaction emerged [$F(1, 55) = 7.04$, $p < .01$]. Thus, over the course of the study the prime group increased in depression from 6.46 to 7.27, whereas overall the other groups decreased from 3.83 to 2.78. The pretest difference between the two groups was large but nonsignificant. The results of this analysis should be considered with caution. Though the analyses were theoretically based, they were still *post hoc*.

The body image variables given after the mood measure were unaffected by the manipulation. Therefore, relationships between variables may be investigated with less concern of contamination from the manipulation. The variable, importance of appearance to self-esteem (IASE), was of interest as a new body image cognitive measures. The relationship between IASE and traditional body image variables was explored via a correlational analysis. A significant correlation was found for physical appearance importance and Body Image Anxiety—State ($r = .25$, $p < .05$).

The pattern of mood responses to the experimental manipulation interaction supports the main schema hypothesis. Low appearance importance and control subjects felt more positively following the manipulation. High appearance importance subjects did not experience this relief and

thus seemed to experience negative emotion in response to schema-relevant information.

STUDY 3

Study 3 was a replication and extension from the results of Study 2. The previous study provided some evidence for a body image schema. Specifically, it showed that body image representations can be primed and result in a mood shift. In Study 3 the stimuli were changed from words to pictures to strengthen the manipulation and make it more naturalistic (since most real-world body image stimuli are visual: e.g., own body in the mirror, advertisements depicting ideal beauties). Because level of body image concern was an important factor in Study 2 (high-importance subjects), the measure of this construct was shifted to one with better psychometric properties for Study 3. In addition, subjects viewed the new stimuli under one of two instructional sets: distracter or social comparison. Social comparison is the act of comparing an aspect of the self to another person. The tendency toward social comparison of physical attributes has recently been shown to be related to body image distress (Heinberg & Thompson, 1992). Distracter instructions lead an individual to focus on nonevaluative aspects of the stimuli. These instructions are intended to create competition with any social comparison or schema-activating process. It was hypothesized that the social comparison viewing instructions would enhance negative self-schema activation, whereas the distracter viewing instructions would inhibit activation. Finally, the procedure was altered to create a within-subject design; that is, each subject was exposed to both self-relevant and neutral stimuli.

Method

Subjects

Subjects were 102 female undergraduates who received extra credit for their participation.

Measures

The Body Image Automatic Thoughts Questionnaire with the negative subscales (BIATQ-N) was used for this study. It was used to divide the subjects into high- and low-distress groups using a median split. Low-

distress subjects were those who scored 72 and below on the BIATQ-N. High-distress subjects were those who scored 73 and above.

Mood and appearance distress measures for this study were the Visual Analog Scales (VAS). There were five VAS's: Depression, Anxiety, Anger, Weight Dissatisfaction, Appearance Dissatisfaction. On either side of a 100-cm line were placed the anchors not depressed/depressed, not anxious/anxious, not angry/angry, no weight dissatisfaction/extreme weight dissatisfaction, no appearance dissatisfaction/extreme appearance dissatisfaction. Subjects were instructed to place a mark at the point of the line which reflected their current mood state. The VAS's correlate highly with standard mood and body image measures (Heinberg & Thompson, 1993).

Subjects' appearance schema content was assessed using a trait list. This list was derived from the PADQ-ideal lists of 68 female subjects who did not participate in either Study 2 or Study 3. Twenty-four of the most common ideals for women were listed (at least four women had to report each trait). Subjects were asked to separately indicate the extent to which each trait was self-descriptive and important to themselves. Traits which subjects rated as nondescriptive but important were hypothesized to be negative emotional triggers. Nondescriptive traits that were unimportant were considered neutral. This operationalization is most similar to Markus' method (subjects' extreme and important trait ratings). Both important and unimportant nondescriptive words were the basis of the manipulation. The fact that all the traits were important for the physical appearance of some women made those traits a better comparison than the body words used in Study 2.

Stimuli

The stimuli for the experiment consisted of pictures that were cut from magazines. For each trait that was part of the trait list for the screening, a picture was cut that showed only that trait. For example, lean legs were legs cut from the hips down. Magazine pictures were used rather than hand-drawn or computer-generated stimuli, because they were more naturalistic potential body image triggers.

Procedure

Subjects began their participation in the study by completing questionnaires which included the trait list and the BIATQ-N. Other questionnaires from other studies were included in the packet to disguise the purpose of the questionnaires.

Four to six weeks later subjects were brought into the lab to participate in the study. Subjects were informed that they would look at some magazine pictures and answer some questions about them. The experimental manipulation consisted of 14 magazine pictures of different appearance traits. Seven of these were pictures of the subjects' own negative triggers and seven were of their own neutral stimuli. Half of the subjects received their negative triggers first (negative-neutral group) and half received neutral stimuli first (neutral-negative group). Subjects were asked to view the pictures under one of two instructional conditions. In the social comparison condition, subjects were asked to indicate, for each picture, how similar they were to that picture and how they felt about that aspect of their appearance. In the distracter condition, subjects were asked to rate how much they liked the picture and to describe what the model might be doing. The five VAS's were given to the subjects three times: prior to the manipulation, after the first block of pictures, and after second block of pictures.

Results

MANOVAs were used for this study to control for Type I errors. The initial analysis was an Order group (Negative-Neutral vs. Neutral-Negative) × Viewing Instruction Condition (Social Comparison vs. Distracter) × Appearance Distress Group (High vs. Low) × time (Pre-, Mid-, Posttest) MANOVA on the five mood ratings combined. Two main effects emerged. First there was an effect of distress group (Rao's $R = 7.45, p < .001$). The high-distress group tended to score more negatively on all mood measures. There was also an effect of time, with subjects tending to experience mood changes across conditions as the experiment progressed (Rao's $R = 4.08$, $p < .001$). This time effect was modified by an interaction with order group (Rao's $R = 2.63, p < .01$). Specifically, subjects only tended to feel better after exposure to neutral stimuli, but tended to feel worse after their negative triggers (see Fig. 2). Thus, like in Study 2, exposure to schema-related material did trigger mood changes.

In order to better understand the significant MANOVA individual ANOVAs were conducted on each of the five measures, separately. The following specific effects were reflected in the MANOVA described above. High body image distress subjects scored felt more negatively in terms of Depression [$F(1, 91) = 7.80, p < .01$], Weight Dissatisfaction [$F(1, 91) = 38.32, p < .001$], and Appearance Dissatisfaction [$F(1, 91) = 28.69, p < .001$] (for means, see Table I). The main effect for time occurred for Anxiety [$F(2, 182) = 16.69, p < .001$] and Appearance Dissatisfaction [$F(2, 182) = 4.56, p < .05$] (for means, see Table II). The Order Group × Time

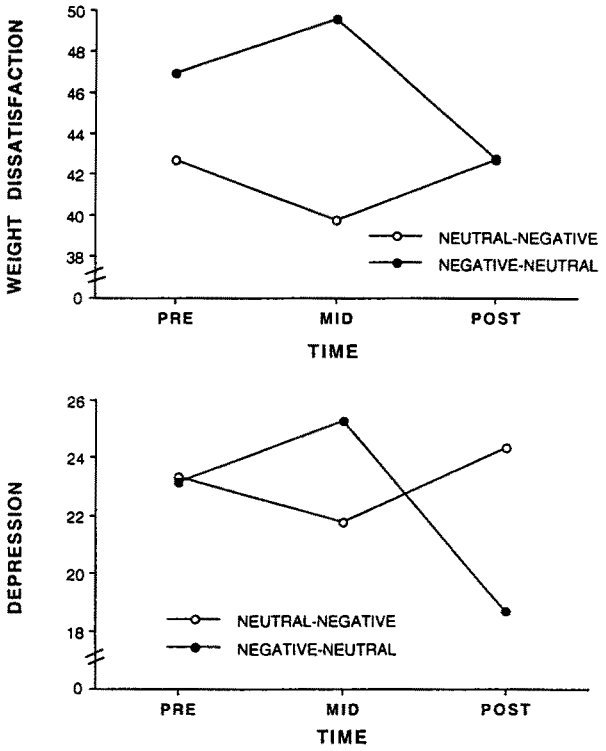

Fig. 2. Schema activation effect: Changes in mood following exposure to neutral stimuli versus negative triggers.

interaction, which reflects the schema effect, occurred for Depression [$F(2, 182) = 4.45, p < .05$], Weight Dissatisfaction [$F(2, 182) = 6.11, p < .01$], and Appearance Dissatisfaction [$F(2, 182) = 8.61, p < .001$] (see Fig. 2).

Some additional ANOVAs were conducted on the effects which were not significant in the MANOVA. These results should be viewed with caution since there was less control for Type I error. Of particular interest were any differences between the distress groups in reaction to the manipulation. In fact, there was an interaction between order group and distress group for anxiety [$F(1, 91) = 3.97, p < .05$]. This interaction appeared to reflect pretest differences in the groups (see Fig. 3). The initial anxiety level of the three groups was between 25 and 30 on the VAS scale; whereas for the high body image distress/negative first group the initial anxiety level was 44.

There was a significant interaction between body image distress group and time [$F(2, 182) = 3.56, p < .05$] for appearance dissatisfaction. High-

Table I. Differences in Overall Mood Associated with High and Low Body Image Distress (BIATQ-N)[a]

VAS mood	Body image distress level		
	Low distress	High distress	*p*-level
Depression	17.51	28.20	$p < .01$
Anxiety	23.03	31.27	$p < .10$
Anger	10.87	15.70	N.S.
Weight Dissatisfaction	29.63	58.31	$p < .001$
Appearance Dissatisfaction	25.46	47.84	$p < .001$

[a]BIATQ-N = Body Image Automatic Thoughts Questionnaire—Negative subscales; VAS = Visual Analog Scales.

Table II. Mood Changes over the Course of the Experimental Manipulation for All Subjects

VAS mood[a]	Time			
	Pre	Mid	Post	*p*-level
Depression	23.25	23.80	21.51	N.S.
Anxiety	31.48	27.29	22.68	$p < .001$
Anger	13.49	13.29	13.08	N.S.
Weight Dissatisfaction	44.75	44.57	42.59	N.S.
Appearance Dissatisfaction	34.39	37.64	37.93	$p < .05$

[a]VAS = Visual Analog Scales.

distress subjects experienced increased appearance dissatisfaction throughout the experiment, regardless of whether the stimuli were neutral or negative triggers. On the other hand, low-distress subjects remained unchanged overall. Thus the mere act of looking at the pictures, regardless of instructions or schema status of the stimuli, affected the high-distress subjects. For the low-distress subjects mood changes under neutral and negative trigger conditions averaged out (see Fig. 4).

Finally, the Order Group × Time interaction, the schema effect for appearance dissatisfaction, was modified by an interaction with viewing instructions [$F(2, 182) = 3.55, p < .05$]. In general, subjects who viewed negative triggers first felt worse, then felt better when receiving neutral stimuli. However, subjects who viewed neutral stimuli first under distracter viewing instructions were later relatively unaffected by their negative triggers. In contrast, subjects who viewed neutral stimuli first under social comparison viewing instructions were very affected by their later negative triggers. Thus,

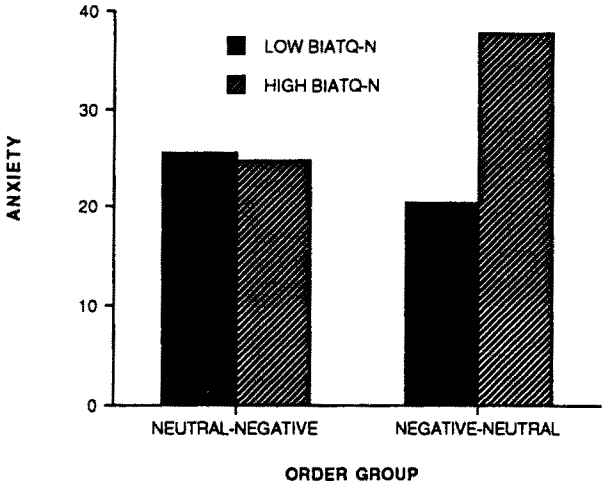

Fig. 3. Changes in anxiety associated with the interaction of order group assignment (neutral first vs. negative triggers first) and level of body image distress. BIATQ-N = Body Image Automatic Thoughts Questionnaire—Negative subscales.

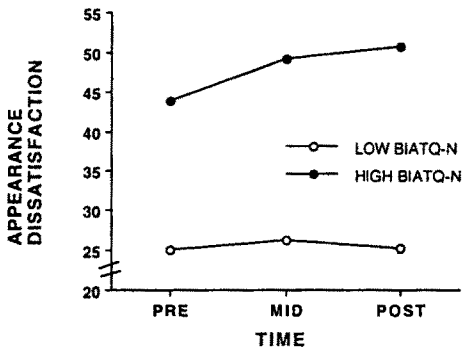

Fig. 4. Changes in appearance dissatisfaction over the course of the experimental manipulation in high and low body image distress groups. BIATQ-N = Body Image Automatic Thoughts Questionnaire—Negative subscales.

it appears that the distracter instructions may provide some protection against schema activation of the initial stimuli are weaker (see Fig. 5).

Taken together, the results of Study 3 further support the existence of schema. Subjects experience more negative emotions following priming of self-relevant body image information. The effect tends to vary depending upon instructional set and subjects' prior levels of distress.

GENERAL DISCUSSION

Summary of Results

These studies were conducted to see if body image acts like a cognitive structure. Each study supported this assertion. Study 1 showed that body image cognition measures are related to what is traditionally referred to as body image. The results of Study 2 are consistent with the assertion that self-related body image information acts like a schema. Specifically, these processing effects involve emotional reactions and enhanced recall. Study 3 added to these results by showing that social comparison enhances the body image schema priming effect. Additionally, high trait distress individuals tended to be more prone to priming of both self-relevant and general body image information. The schema activation effects from Studies 2 and 3 add a crucial piece of support to the body image schema hypothesis.

The Body Image Schema. In real-world terms the schema activation effect may behave as follows. Certain activating events in the environment (e.g., reading a fashion magazine, watching a movie with beautiful women) can interact with an individual's own perceived deficits to elicit a negative mood and body image distress.

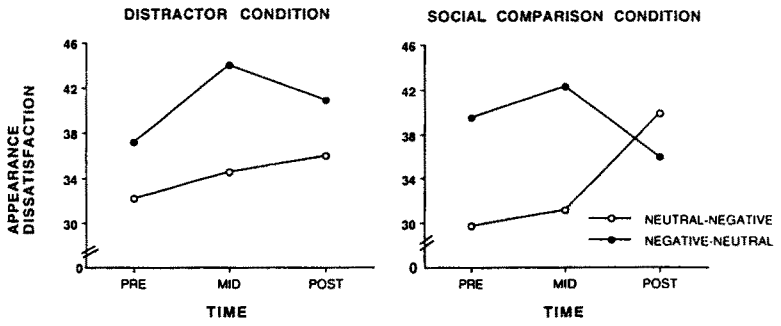

Fig. 5. Changes in appearance dissatisfaction as a result of viewing instructions and exposure to neutral versus negative trigger stimuli.

It seems clear that the activation of the body image schema has emotional consequences in the form of depression and anxiety. This is not unexpected given the relationship between body image distress and depression (Mori & Morey, 1991). What these studies imply is the causal link—that activation of the body image schema appears to create a change in mood.

Another property of the body image representation is that engaging in social comparison appears to enhance activation of the negative body schema and resulting mood shifts. Social comparison can be seen as a cognitive process that is tied in with body image schema.

A third property of body image schema is its stability. These studies showed that schema content reported 1 month earlier has the potential to cause mood changes when primed. This stability suggests a well-defined mental representation.

Treatment Implications. The value of this research also has to be measured in its implications for clinical disorders. These studies have some interesting implications for the understanding and treatment of disorders relating to body image distress. The results of Study 3 begin to suggest some treatment implications. Subjects who viewed their neutral traits first under distracter conditions did not feel worse when they saw their negative traits. It was as if the distracter instructions helped them resist the schema activation effect.

In terms of understanding body image distress, these results are not clear-cut. High-distress subjects were clearly more reactive than low-distress subjects in Study 2, but not in Study 3. The manipulation in Study 3 was designed to be stronger. Perhaps what these studies show is that all women have enough concern about their bodies to develop some schema. Perhaps the differences between those with high and those with low body image disturbance is in how frequently negative body image is activated. In depression research the frequency of activation of negative self constructs is said to be a sign of pathology (Segal, 1988). In the most extreme case, one would experience chronically accessible negative cognitions (Higgins & Bargh, 1987). Another potential difference for those with body image distress may be in self-selecting stimuli which confirm their negative self-beliefs (an explanation consistent with Markus' definition of self-schema). A third possibility is that the schema difference between high and low body image disturbed subjects may be in the recovery from negative schema activation. Many subjects reported comments like "Yes the pictures were pretty, but not everyone can look that way," or "Looks aren't everything." Given the preponderance of potential body image schema activation events (i.e., the mass media are filled with beautiful women), perhaps an efficient recovery is what protects most people from more severe disturbance.

Relations to Prior Research. Overall these results lend support to the view of body image as a form self-schema. In turn they broaden the support of self-schema in relation to clinical disorders. For example, self-schema of traits have been shown to be important in depression. Now a form of self-schema has been shown to be important to body image, thus strengthening the theoretical and practical importance of self-schema. More specifically, the way Higgins defined self-representation been shown to be useful in a different domain, body image. In these body image studies, appearance-related discrepancies have emotional consequences consistent with Higgins' theory. The notion that specific discrepancies are related to certain emotions has been validated in the body image domain. For example, in the results of Study 3, it was shown that depression was aroused by body image schema activation, not by anger.

These results do support the idea that self-related information is treated differently: Specific individualized self-related information triggers the emotional responses (e.g., Higgins, 1987). The one exception to that pattern is that, in Study 3, high-distress subjects felt worse following exposure to both self-relevant and general body image information. Thus, for this group, the appearance domain overall, not the specific content, was reactive.

This series of studies adds to the current research by showing that body image cognitions act like a schema. Recall that prior research which empirically tested schema processing focused on weight-related cognitions. Although body weight cognition is most clearly related to eating disorders, it has not been shown that it is the main component of the body image schema. Most people are as concerned about their appearance as their weight (Cash, Winstead, & Janda, 1986).

Limitations

The results are generally positive about the applicability of cognitive models to body image, but there are qualifications. The relationship between cognitive measures and body image is relatively small. The schema activation effect in Study 2 is also relatively small. In Study 3 high-distress subjects tended to react more than low-distress subjects to both self-relevant and non-self-relevant information, suggesting that individual cognitions are not always that special.

The small size of the mood shift (see Figs. 1 and 2) is a concern. Some subjects did report uncomfortable feelings during the debriefing. At least for them the mood shift may have been large enough to be noticed. Still, it remains to be investigated whether the phenomenon found in the

laboratory is of the same type as the body image disturbance that causes clinical disorders. This is especially true since the relationship between schema and distress measures was relatively low.

Future Directions

The series of studies is perhaps a beginning step in applying cognitive models to body image. It is clear that physical appearance information can act like a schema, becoming activated by environmental triggers. However, it must be shown more clearly what is different about those who experience more chronic body image distress.

One of the main implications of this research is the conceptualization of body image as a cognitive structure. Thus, both the body image disturbance associated with eating disorders and body dysmorphic disorder represent a continuum of cognitive self-image types of problem. More evidence is needed relating schema to clinical disorders, especially to see if a diverse group of disorders shares this common cognitive model.

Physical appearance may continue to be a good domain in which to study self-schema phenomena. Unlike personality characteristics, which are usually operationalized verbally, body image characteristics may be presented in verbal and nonverbal methods. It is much easier to determine actual physical traits than actual personality traits if one wanted to compare perceived versus objective dimensions. Moreover, in contrast to the thousands of personality traits, there are fewer traits to describe physical appearance attributes. Finally, physical traits may be more concrete than personality traits.

A separate set of questions results from the relationship between this study and other studies of cognitive processing in body image. Many of these studies have focused on weight-related body image, which is important to many individuals in Western society. Weight-related body image is the core issue in eating disorders. So it begs the question of how important it is to investigate individual body image cognitions as was done here. How much extra information can be obtained by focusing on individual body image versus cognitive processes of general body image issues?

Evidently, many questions remain. These studies supported the interpretation of the term *body image* as a mental representation, as the Gestaltists theorized. That information alone is a beginning step in understanding the nature of that representation and how it operates. Still the relationship between appearance schema and clinical disorders remains undefined. The nature of the representation, its properties, and the importance of individual cognition also require further study. What the Gestaltists saw as the

body image schema continues to be an interesting and potentially useful construct today.

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