

# The Effect of Experimental Presentation of Thin Media Images on Body Satisfaction: A Meta-Analytic Review

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**Abstract: Objective:** *The effect of experimental manipulations of the thin beauty ideal, as portrayed in the mass media, on female body image was evaluated using meta-analysis. Method:* Data from 25 studies (43 effect sizes) were used to examine the main effect of mass media images of the slender ideal, as well as the moderating effects of pre-existing body image problems, the age of the participants, the number of stimulus presentations, and the type of research design. **Results:** *Body image was significantly more negative after viewing thin media images than after viewing images of either average size models, plus size models, or inanimate objects. This effect was stronger for between-subjects designs, participants less than 19 years of age, and for participants who are vulnerable to activation of a thinness schema. Conclusion:* Results support the sociocultural perspective that mass media promulgate a slender ideal that elicits body dissatisfaction. Implications for prevention and research on social comparison processes are considered. © 2002 by John Wiley & Sons, Inc. *Int J Eat Disord* 31: 1–16, 2002.

**Key words:** *meta-analysis; media images; female body image*

## INTRODUCTION

In one study, adolescent girls described the ideal girl as 5 ft 7 in., 100 lb, size 5, with long blond hair and blue eyes (Nichter & Nichter, 1991). This schema may appear benign. However, when females do not and cannot in fact fit this very slender beauty standard (body mass index [BMI] = 15.61), problems ensue. The internalization of such a stringent (if not anorexic) and essentially unattainable ideal of beauty can lead to body dissatisfaction, negative affect, low self-esteem, or even eating disorders (Heinberg, 1996; Rodin, Silberstein, & Striegel-Moore, 1985; Thompson & Stice, 2001).

During late childhood and early adolescence, when social comparison plays a more significant role in self-perception, females who do not have the ideal body shape agonize about their bodies (Levine & Smolak, 1998; Smolak & Levine, 1996). Adolescent girls and college women are most affected by poor body image and are most likely to diet (Grogan,

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Williams, & Connor, 1996). The moderate degree of dissatisfaction that is now normative among women (Rodin et al., 1985) encourages many girls and women to diet to manipulate their size and shape (Gordon, 2000). However, due to genetics and the physiology of weight regulation, only a few females can actually mold their bodies into the idealized slender shape. Thus, dieting, coupled with certain personality and family dynamics, can induce all-consuming, dangerous eating disorders such as anorexia nervosa and bulimia nervosa (Polivy & Herman, 1999).

The thin ideal is conveyed and reinforced by many social influences, including family, peers, schools, athletics, business, and health care professionals (Levine & Smolak, 1996, 1998; Smolak & Levine, 1996; Thompson & Stice, 2001). However, the loudest and most aggressive purveyors of images and narratives of ideal slender beauty are the mass media. "Mass media" refers to a variety of technologies, ranging from billboards to radio, but current theories and studies emphasize visual media such as magazines and television. Targeting markets to sell products such as diets, cosmetics, and exercise gear, the media construct a dreamworld of hopes and high standards that incorporates the glorification of slenderness and weight loss (Kilbourne, 1999; Levine & Smolak, 1996; Pollay, 1986). In so doing, "today's media blurs [*sic*] the boundaries between glorified fiction and reality" (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999, p. 93). Nichter and Nichter (1991) quoted a young girl's reaction to looking at teen magazines: "Am I fat?. . . Am I overweight? Like, you never think about it until you look at it" (p. 263). Research indicates that magazine advertisements are often used as a social comparison standard (Martin & Kennedy, 1993; Shaw & Waller, 1995).

Being so caught up in images, beauty standards, and body image does not affect boys as acutely. Boys learn to view their bodies as a tool to master the environment, whereas girls learn that their bodies should be used to attract others (Stephens, Hill, & Hanson, 1994). When boys experience body dissatisfaction, it is often due to sociocultural pressures that encourage larger, excessively muscular, and powerful bodies (Pope & Gruber, 1997).

Through the flashy images of "perfect" female beauty promoted ubiquitously in magazines, television, and films, female and male viewers alike may quickly infer that a female's body is her most important attribute and thus a lifelong project (Brumberg, 1997). This perfect body has flawless skin, a thin waist, long legs, and well-developed breasts (Thompson et al., 1999). Both beauty and morality have become equated with greater degrees of thinness, so a "good" girl must be and remain thin and in control of her desires (Rodin et al., 1985). This pressure is exacerbated by prejudice against fatness (Thompson et al., 1999).

The female body is reflected and projected in the media as an object of desire, shown in pieces, rather than, as with males, portrayed with a focus on the face or the whole, clothed body (Archer, Iritani, Kimes, & Barrios, 1983). Objectifying the body adds to the shift in focus of young adolescent girls from achievements and academics to appearance consciousness (Levine & Smolak, 1996). According to objectification theory (Fredrickson & Roberts, 1997), because females are socialized to see themselves as objects to be looked at and evaluated, they are more likely to feel shame and anxiety for not appearing perfect. The "body project" to reduce the discrepancy between actual body size and ideal body image results "in an unstable self-perceived body image that is responsive to social cues" (Martin & Kennedy, 1994, p. 110). Sadly, to fit the thin ideal, one not only fights against natural physiology but also against the inundation of high-caloric food advertisements (Silverstein, Perdue, Peterson, & Kelly, 1986).

A number of studies have examined body satisfaction, eating disorder symptomatology, and negative affect as correlates of using mass media (Botta, 1999; Cusumano &

Thompson, 1997; Harrison & Cantor, 1997; Stice, Schupak-Neuberg, Shaw, & Stein, 1994). The studies found varying levels of significance, and even within a single study contradictory results appeared. Harrison and Cantor (1997) found that women who read more magazines were more likely to report eating disorder symptomatology. Yet, they did not find that the amount of exposure to television correlated with eating disorder symptomatology. In contrast, Stice et al. (1994) found that the more a participant had been exposed to magazines and television during the previous month, the higher the level of body dissatisfaction, gender role endorsement, and eating disorder symptomatology.

A particularly important source of data concerning media effects is controlled experimentation that exposes participants to images of slender beauty in order to gauge the immediate psychological impact. In several reviews, Levine and Smolak (1996, 1998) have argued that studies of the acute effects of images of thin models do not support a straightforward relationship between media and negative body image. Some experiments do show that females who view thin media images experience lower body satisfaction levels than do females who view neutral images. For example, Posavac, Posavac, and Posavac (1998) found that participants who viewed models had significantly greater body dissatisfaction than participants who viewed cars. Stice and Shaw (1994) compared the reactions of young women viewing models from *Cosmopolitan* with the responses of participants viewing models of normal weight. Consistent with the findings of Posavac et al. (1998), women viewing the thin ideal felt significantly more dissatisfied about their bodies afterward and they also reported significantly more emotional distress.

Other studies have found little to no immediate effect of thin media images on body satisfaction. Martin and Kennedy (1993) reported no significant difference in body self-perception between participants aged 9–18 who viewed thin models and participants who viewed control images. Comparing the influence of thin models versus control photographs, Champion and Furnham (1999) also found no significant difference in body satisfaction levels, regardless of age. To complicate matters further, Posavac et al. (1998), in conducting separate analyses on satisfied and dissatisfied participants, found that the satisfied participants felt thinner after viewing advertising focused on thin body image than did the satisfied participants in the control condition neutral images.

Inconsistent results sometimes appear within a single study. Irving (1990) found no significant difference between the acute impact of slides of thin models and that of pictures of cars on body satisfaction levels, although participants felt significantly more dissatisfied after viewing thin models as opposed to overweight models. Cash, Cash, and Butters (1983) found that participants rated their own “physical attractiveness” significantly lower after viewing thin models as opposed to plainer models, but there was no significant difference in “overall satisfaction with their bodies.”

Such contradictory results and procedures require a deeper synthesis than a simple tally of the numerous articles researching the acute effects of the slender ideal. When comparing studies, counting the number of significant results versus insignificant results (Levine & Smolak, 1996, 1998) could produce erroneous conclusions. Meta-analysis provides a quantitative method for examining the size of the overall effect in the relationship between experimental media exposure and its impact on body image, and for exploring sources of variation in outcomes across studies (Hedges & Becker, 1986).

The present study is a quantitative, meta-analytic review of controlled experiments that evaluate the immediate effects of images of slender, ideal beauty on female body image. Four hypotheses were tested. First, we expected an overall significant effect such that viewing slender models would increase a female’s immediate sense of body dissatis-

Table 1. Characteristics of samples used in the meta-analysis

Study	<i>d</i> value	EN	CN	Eating Disorders	Ages	Mode	Type of Control	Measures
Borges (1998)	-0.36	50	50	Unspec.	College	Magaz. (photos)	10 larger size models	EDI-BD
Cash, Cash, and Butters (1983)	-0.55	17	17	Unspec.	M = 22.7	Magaz. (photos)	1 unattractive	Physical Attractiveness 10 pt Likert scale
Cattarin, Thompson, Thomas, and Williams (2000)	-0.55	30	30	Unspec.	M = 22.97	TV Commercials	Models not fitting thin ideal	VAS-Appearance Dissatisfaction
Crouch and Degelman (1998)	-0.68	20	20	Unspec.	M = 15.4	Magaz. (photos)	3 models altered as overweight	Self-attractiveness Scale
Freske (1998)	-0.01	49	44	Unspec.	M = 19.5	Magaz. (slides)	15 overweight models	Body Esteem Scale-Weight
Grogan, Williams, and Conner (1996)	-0.14	23	22	Unspec.	College	Magaz. (photos)	16 landscapes	Body Esteem Scale
Hamilton and Waller (1993)	-0.28	24	24	Y	M = 27.3	Magaz. (photos)	20 pictures of home	Body size estimation (BPIs),
High body dissatisfaction							20 pictures of homes	Body size estimation (BPIs),
Low body dissatisfaction	0.11	24	24	N	M = 25.6	Magaz. (photos)		
Heinberg and Thompson (1995)								
High body dissatisfaction	-0.71	31	29	Y	18-48	TV commercial	20 on pain relievers	VAS-Body Satisfaction
Low body dissatisfaction	-0.03	39	38	N	18-48	TV commercial	20 on pain relievers	VAS-Body Satisfaction
Henderson-King and Henderson-King (1997)	-0.03	42	40	Unspec.	College	Magaz. (slides)	30 neutral (w/o humans)	Body Esteem scale
Irving (1990)								
High body dissatisfaction	-0.61	15	15	Y	College	Magaz. (slides)	Average non models	Weight Satisfaction
Medium body dissatisfaction	-0.02	15	12	Y	College	Magaz. (slides)	Average non models	Weight Satisfaction
Low body dissatisfaction	-0.06	11	13	N	College	Magaz. (slides)	Average non models	Weight Satisfaction
Kalodner (1997)	-0.56	32	29	Unspec.	M = 18.97	Magaz. (photos)	12 pictures of older people	Private Body Self-Consciousness
King, Menzel, and Baird (1997)								
High body dissatisfaction	-0.57	8	8	Y	18-25	Magaz. (slides)	Normal models (size 10)	Visual size estimation
Medium body dissatisfaction	-0.33	10	11	Y	18-25	Magaz. (slides)	Normal models (size 10)	Visual size estimation
Low body dissatisfaction	-0.46	15	15	N	18-25	Magaz. (slides)	Normal models (size 10)	Visual size estimation
Lavine, Sweeney, and Wagner (1999)	-0.38	35	34	Unspec.	College	TV commercial	20 non sexist TV ads	Pictorial Body Image Scale

Martin and Gentry (1997) Age $M = 9.8$	-0.31	17	16	Unspec.	$M = 9.8$	Magaz. (slides)	No models	Physical Attractiveness-2 questions Physical Attractiveness-2 questions Physical Attractiveness-2 questions
Age $M = 11.9$	-0.29	18	23	Unspec.	$M = 11.9$	Magaz. (slides)	No models	Physical Attractiveness-2 questions Physical Attractiveness-2 questions
Age $M = 13.8$	-0.49	16	15	Unspec.	$M = 13.8$	Magaz. (slides)	No models	Physical Attractiveness-2 questions Physical Attractiveness-2 questions
Martin and Gentry (1997) Age 4th grade	-0.23	27	15	Unspec.	4 <sup>th</sup>	grade Magaz. (slides)	6 average models	Self-Perception of Physical Attractiveness (Harter) Self-Perception of Physical Attractiveness (Harter)
Age 8th grade	0.30	22	16	Unspec.	8 <sup>th</sup>	grade Magaz. (slides)	6 average models	Self-Perception of Physical Attractiveness (Harter) Self-Perception of Physical Attractiveness (Harter)
Age 12th grade	0.14	10	14	Unspec.	12 <sup>th</sup>	grade Magaz. (slides)	6 average models	Self-Perception of Physical Attractiveness (Harter) Self-Perception of Physical Attractiveness (Harter)
Ogden and Mundry (1996) Posavac, and Posavac (1998), Experiment 1 High body dissatisfaction	-0.47	10	10	Unspec.	College	Magaz. (photos)	5 overweight models	VA Body Satisfaction
Posavac et al. Low body dissatisfaction	-0.53	41	41	Y	College	Magaz. (slides)	10 cars	Body Esteem scale-Weight Concern Weight Concern Body Esteem Scale
Posavac et al., (1998), Experiment 2 High body dissatisfaction	0.23	30	24	N	College	Magaz. (slides)	10 cars	Body Esteem Scale Body Esteem Scale
Low body dissatisfaction	-0.54	43	47	Y	College	Magaz. (slides)	10 cars	Weight Concern Body Esteem Scale Weight Concern Body Esteem Scale
Posavac et al. (1998) High body dissatisfaction	0.28	15	15	N	College	Magaz. (slides)	10 cars	Body Esteem Scale Weight Concern Body Esteem Scale Weight Concern
	0.63	20	20	Y	College	Magaz. (slides)	10 cars	Body Esteem Scale Weight Concern Body Esteem Scale Weight Concern

Table 1. (Continued)

Study	<i>d</i> value	EN	CN	Eating Disorders	Ages	Mode	Type of Control	Measures
Posavac, Posavac, and Weigel (in press)	-1.12	25	25	Y	College	Magaz. (slides)	20 automobiles	EDI-Weight Concern
Richins, (1991)	-0.33	37	36	Unspec.	College	Magaz. (slides)	6 ads w/o models	Physical Attractiveness
Rated overall satisfaction	-0.33	42	45	Unspec.	College	Magaz. (slides)	6 ads w/o models	Body Satisfaction Overall
Shaw (1995)								
Age M= 14.5	-0.20	24	24	Unspec.	M = 14.5	Magaz. (photos)	20 neutral pictures	Body Satisfaction Scale
Age M = 27.3	-0.02	24	24	Unspec.	M = 27.3	Magaz. (photos)	20 neutral pictures	Body Satisfaction Scale
Stice and Shaw (1994)	-0.15	50	55	Unspec.	M = 19	Magaz. (photos)	Pictures w/no people	Body Dissatisfaction
Tan (1979)	-0.50	23	33	Unspec.	16.18	TV commercial	15 dog food commercials	Need for beauty to be "personally desirable"
Thornton and Maurice (1997)	0.22	36	22	Y	M = 20.8	Magaz. (slides)	No slides	EDI-Body Dissatisfaction
High body dissatisfaction								
Medium body dissatisfaction	-0.17	30	30	Y	M = 20.8	Magaz. (slides)	No slides	EDI-Body Dissatisfaction
Low body dissatisfaction	-0.43	34	24	N	M = 20.8	Magaz. (slides)	No slides	EDI-Body Dissatisfaction
Turner, Hamilton, Jacobs, Angood, and Dwyer (1997)	-0.42	24	24	N	College	Magaz. (photos)	News magazines	Body Satisfaction
Williams and Thompson (in press)	-0.53	64	74	Unspec.	M = 21.88	Magaz. (slides)	Neutral product	Questionnaire VAS-Body Satisfaction

Note: Unspec. = unspecified; Magaz. = Magazine; BD = Body Dissatisfaction scale; BPI = Body Perception Index; VAS = Visual Analogue Scale; EDI = Eating Disorders Inventory.

faction. Second, we also expected that females with a pre-experiment history of eating disorders or high body dissatisfaction scores would be more susceptible to the negative effects of thin media images that activate their internalized slender beauty ideal (Shaw & Waller, 1995). Due to statistics placing the eating disorder prevalence rate for females ages 15–19 at 125.1 per 100,000 per year and for females ages 20–24 at 82.7 per 100,000 per year (van Hoeken, Lucas, & Hoek, 1998), we expected females younger than 19 to be significantly more susceptible to thin images than females older than 19. Fourth, we expected larger doses of exposure (e.g., 25 thin media images) to have a more negative effect than smaller amounts of stimuli presented (e.g., five images).

## METHODS

### Locating Studies

PsychINFO, Medline, and First Search were used to gather published and unpublished research. Key words and phrases placed in these search engines were *media*, *body image*, *body dissatisfaction*, *contrast effect*, and *thin ideal*. The Citation Index was used to find articles that had cited the most relevant previous articles (Cash et al., 1983; Hamilton & Waller, 1993; Irving, 1990; Stice & Shaw, 1994). The indexes of five journals from 1991 through 1999 were also reviewed: *Eating Disorders: The Journal of Treatment and Prevention*; *International Journal of Eating Disorders*; *Journal of Personality and Social Psychology*; *Personality and Social Psychology Bulletin*; and *Sex Roles*. Further, we carefully perused the reference sections of articles on body image and media (Champion & Furnham, 1999; Crouch & Degelman, 1998; Cusumano & Thompson, 1997; Faith, Leone, & Allison, 1997), as well as relevant chapters (Levine & Smolak, 1996, 1998), books (Cash & Pruzinsky, 1990; Thompson et al., 1999), and dissertations in progress (Strong, personal communication, August 25, 2000). This multifaceted search resulted in 140 studies that addressed various aspects of the relationship between mass media and body satisfaction, including methods to circumvent possible negative effects from the media (Berel & Irving, 1998).

Table 1 presents the effects gleaned from 25 studies that met five criteria for inclusion in the meta-analysis of experimental studies:

1. Because females have a much greater rate of body dissatisfaction and disordered eating than males (van Hoeken et al., 1998), we focused on studies with female samples.
2. The study presented, in some form, actual media stimuli that depict the entire body of thin models. Thus, studies of the impact of photographs of attractive college women (Makkar & Strube, 1995; Thornton & Moore, 1993) were not included. Studies used a variety of presentation methods such as slides, advertisements pasted on cardboard, or video clips from television commercials. To mask the purpose of their study, Turner, Hamilton, Jacobs, Angood, and Dwyer (1997) placed four fashion magazines in the waiting room for the participant to peruse.
3. As a "control" comparison, the study included stimuli depicting at least one of the following: average models, attractive nonmodels, overweight models, or objects such as cars or houses.
4. The study measured body dissatisfaction or physical attractiveness as the dependent variable(s). As noted previously, many theorists agree that the con-

Table 2. Coding categories and results

Variable	Number of Studies	Number of <i>d</i> values	<i>d</i> Value	$\chi^2$ Value
Dissatisfaction history				15.8**
Participants with significant body issues	7	12 (28%)	-.50	
Participants without significant body issues	8	10 (23%)	-.10	
Unspecified body issues	16	21 (49%)	-.36	
Ages				5.57*
Not yet in college	5	9 (21%)	-.36	
College and older	21	31 (79%)	-.34	
Number of stimuli presented				7.53*
1 through 9	9	14 (33%)	-.45	
10 through 19	11	20 (47%)	-.31	
20 and over	5	9 (20%)	-.28	
Dependent variable				6.67
Body satisfaction	12	17 (40%)	-.34	
Weight satisfaction	4	10 (23%)	-.42	
Physical attractiveness	8	11 (26%)	-.30	
Body estimation	2	5 (11%)	-.23	
Control				-2.13
Average model	6	10 (23%)	-.34	
Houses or cars; images w/o youth	15	29 (67%)	-.30	
Overweight model	4	4 (10%)	-.29	
Methodology				8.63*
Posttest only between	14	19 (44%)	-.37	
Pretest and posttest between	9	20 (46%)	-.36	
Within subjects	2	4 (20%)	-.10	

\* $P < .05$ .\*\* $P < .01$ .

stant bombardment of thin images has a variety of negative effects on females (Kilbourne, 1999; Levine & Smolak, 1996). Thus, researchers have examined media's influence not only on body image but also on mood and depression (Stice & Shaw, 1994) and on self-esteem (Irving, 1990). However, the general model being tested by the experimental manipulation of images of slender beauty, and thus the model being tested in our meta-analysis, is that frequent, repetitive exposure to this unrealistic standard leads to or intensifies negative body image.

- There was sufficient information (e.g., means and standard deviations, *t* or *F* values; Hedges & Becker, 1986) to compute effect size, or researchers kindly responded to written requests for this information. Five studies were not used because they were missing standard deviations, *F* or *t* scores, or other crucial information; in each instance, we contacted one of the authors, who was unable provide the information needed.

### Body Dissatisfaction

Body image is a complex construct, especially in a society where girls are encouraged to be hyperaware of, and define their identity in terms of, appearance (Cash & Pruzinsky, 1990; Thompson et al., 1999). Negative body image has been evaluated in terms of both

cognitive-evaluative dissatisfaction and perceptual body size distortion (Cash & Deagle, 1997). Typically, cognitive and affective dissatisfaction is assessed through self-rating using either pictures of various body forms or Likert-type items on a questionnaire. We coded our studies into one of four categories based on the dependent variable used: body satisfaction, weight satisfaction, physical attractiveness, and body size estimation (Table 2).

As shown in Table 2, 13 studies assessed body dissatisfaction: one study used the Pictorial Body Image Scale (PBIS; Stunkard, 1983); two used the Body Dissatisfaction subscale of the Eating Disorders Inventory (EDI; Garner, Olmsted, & Polivy, 1983); four studies used the Visual Analogue Scale (VAS; Heinberg & Thompson, 1995); and the six remaining studies used various other scales. The four studies examining weight satisfaction used the Body Esteem Scale (BES; Franzoi & Herzog, 1987). Seven studies assessed physical attractiveness by either creating their own questions or using the BES subscale.

Body size estimation was used in two studies to assess body size distortion, which refers to the discrepancy between actual size and visual experience of body size (Cash & Deagle, 1997). Participants estimate "body width" for the chest, waist, and hips and "body depth" for the abdomen. The experimenter then measures those identical four points using calipers. Using the body perception index (BPI) formula, estimated body size is divided by actual body size and multiplied by 100. The means and the standard deviations of the BPIs from the experimental and control conditions were used for our meta-analysis. Several studies assessed the impact of media on several body image variables. In those instances, a rule was applied giving priority to overall body dissatisfaction. For example, Cash et al. (1983) rated both body dissatisfaction and physical attractiveness, but the effect size used in the meta-analysis was based on body dissatisfaction.

### Other Moderating Variables

A summary of the other potential moderators is provided in Table 2. The number of stimuli presented in the studies ranged from 1 to 50. To evaluate whether this affected *d* values (hypothesis 4), three coding categories were created according to the number of stimuli (Table 2): 1–9, 10–19, and 20 or more. Total amount of exposure could not be calculated because the majority of studies did not specify the exposure duration.

The control condition(s) also varied across and, in three cases, within studies. To examine the effect of overly thin models on body image, comparisons with normal weight, attractive, fashion models are the most powerful theoretically. Thus, for the studies (Cash et al., 1983; Irving, 1990; Stice & Shaw, 1994) that featured more than one comparison condition, we selected the average model control to be incorporated into the effect size. Although use of control images of cars or houses makes it difficult to single out whether lowered body satisfaction is due to extreme thinness of the experimental stimulus or to the presence of an attractive person, this was the control condition in 61% of the studies. Control images of overweight models are also problematic due to the stigmatization of obesity (Rodin et al., 1985). A significant difference could be due to the contrast effect of peoples' satisfaction rising after a stimulus of overweight models rather than after a stimulus of thin models (Irving, 1990). Nevertheless, this was the control condition in four studies.

The fact that so few studies use average size models as the control is probably attributable to their scarcity in mass media (Levine & Smolak, 1996). Richins (1991), in attempting to create an "average model" condition with models falling in the normal

weight range, could not locate a sufficient number of representative stimuli. Stice and Shaw (1994), in collecting average weight models, had to clip advertisements from magazines designed for "larger" women.

Eating disorders are most prevalent in women ages 15–19 (van Hoeken et al., 1998). Women aged 20–24 are second in susceptibility, followed by women aged 25–29. Because only two studies used samples with older women, we coded studies according to two categories: younger than 19 and older than 19.

A history of body image problems or eating disorders has been found to increase susceptibility to media images (Hamilton & Waller, 1993; Irving, 1990). Participants who scored high on a body dissatisfaction inventory or who were recruited from eating disorders clinics were coded as having a history of body dissatisfaction. Participants who scored low on a body dissatisfaction inventory were placed in the low body dissatisfaction category. The third coding category included groups of participants whose level of body dissatisfaction or disordered eating was not assessed before the stimuli were presented. The small number of effect sizes in the body issues category prevented further separation of people with a history of eating disorders from people with high body dissatisfaction.

The majority of studies assessed the experimental effect using poststimulus scores only. Nine studies conducted pretests and posttests. However, because the rest of the studies did not include a pretest, we discarded the pretest results in determining the effect sizes for those studies. Nevertheless, studies were coded into three methodological categories: between subject, posttest only; between subject, pretest and posttest; and within subject.

### Calculation of Effect Sizes

Whenever possible, we calculated effect size ( $g$ ) by subtracting the control group mean from the experimental group mean and then dividing by the pooled standard deviation (Hedges & Becker, 1986). When means were not available (Richins, 1991), the formulas provided by Hedges and Becker (1986) to transform  $F$  and  $t$  scores into  $g$  scores were used. The  $g$  scores were then multiplied by a correction formula, which takes into account sample sizes to produce the unbiased population effect size ( $d$ ). Thus, the  $d$  value reflects the weighted, standardized difference between the experimental group's mean and the control group's mean.

In some instances, more than one independent effect size was available from the same study. Eight studies (Hamilton & Waller, 1993; Heinberg & Thompson, 1995; Irving, 1990; King, Menzel, & Baird, 1997; Martin & Gentry, 1997; Martin & Kennedy, 1993; Shaw, 1995; Thornton & Maurice, 1997) conducted only one experiment but used more than one set of participants, blocked according to body dissatisfaction levels or age. Richins (1991) reported two studies, yielding two  $d$  values. In each of the three separate experiments conducted by Posavac et al. (1998), participants were categorized beforehand into low and high dissatisfaction with body based on EDI scores. This resulted in six possible  $d$  scores, but the low dissatisfied sample in Experiment 3 had only 3 participants, so that effect was discarded.

## RESULTS

Based on 25 studies ( $N = 2,292$ ), 43  $d$  values were calculated. A negative  $d$  value means that thin media images had an adverse influence on body satisfaction levels compared

with control images. Conversely, a positive  $d$  value means that thin media images had a more positive impact on body satisfaction levels than did control images. There were 38 negative  $d$  values (86%) and 5 positive  $d$  values, and the values ranged from  $-1.12$  (Posavac, Posavac, & Weigel, in press) to  $0.30$  (Martin & Kennedy, 1993). The overall  $d$  value was  $-0.31$ ,  $z = -7.37$ ,  $p < .0001$ ; 95% confidence interval (CI):  $-.40$  to  $-.23$ . Consistent with Hypothesis 1, body satisfaction for women is significantly lower after viewing thin media images than after viewing media images of average size models, of cars or houses, or of overweight models.

Effect sizes were not significantly heterogeneous across studies at  $\chi^2(42) = 41.38$ ,  $p > .05$ . Nevertheless, given the moderate amount of heterogeneity, we used the analysis of variance (ANOVA)-like procedures recommended by Hedges and Becker (1986) to test our remaining hypotheses and to examine several other variables such as type of control condition and type of dependent measure. When a significant between-group heterogeneity effect for a variable with more than two levels was found, post-hoc contrasts analogous to those in the ANOVA were applied (Hedges & Becker, 1986).

Table 2 shows that Hypotheses 2 and 3 were supported. As expected, samples with significant body issues were more adversely affected by thin media stimuli than samples without body dissatisfaction issues,  $z = 3.02$ ,  $p < .01$ . Consistent with Hypothesis 3, people not yet in college were more adversely affected by the presentation of thin media stimuli than people aged 19 and over.

There was also a significant effect of the number of stimuli presented, but the direction of significance contradicted Hypothesis 4. The post-hoc comparisons were not statistically significant, but it appears that as the number of stimuli presented expands, participants are less affected by the presentation of thin media images.

The heterogeneity analyses indicated no significant difference in effect size across the four dependent measures (Table 2). The negative effect of the slender ideal appears to be greater when compared with the effect of images of heavier, more full-figured women, but the heterogeneity effect was not significant. Only four studies relied on the contrast between thin and heavy models.

There was a significant effect for type of research design. As shown in Table 2, the effect size was greater for the average of the two types of between-group designs ( $d = -.37$ ) than for the within-subject methodology ( $d = -.10$ ).

## DISCUSSION

There is a tremendous amount of theory and research on the thin ideal conveyed by the mass media (Kilbourne, 1999; Levine & Smolak, 1996, 1998; Thompson et al., 1999; Thompson & Stice, 2001). This meta-analysis is the first statistical review of the effects of experimental manipulations of the thin ideal on the body image of girls and women. The meta-analysis of 43 effects reported in 25 studies produced a small but relatively consistent and significant effect size of  $-0.30$  (Cohen, 1977). In general, as hypothesized, body image for females was significantly more negative after viewing thin media images than after viewing images of either average size models, plus size models, or cars and houses. This effect appears to be stronger when the research design did not expose participants to both the experimental and control images. The similar effect sizes for comparisons with average size models and inanimate objects support the proposition that the slenderness of the models as ideals of beauty contributes to the negative effect (Thompson & Stice, 2001).

The omnibus effect size revealed by this meta-analysis supports the sociocultural perspective that mass media such as fashion magazines and television promote, if not establish, a standard of slender beauty that leads many females to feel badly about their weight and shape (Levine & Smolak, 1996; Stice, 1994; Thompson et al., 1999; Thompson & Stice, 2001). For too many females, this effect increases the frequency of negative emotions and the frequency with which they feel badly, not only about their bodies, but about themselves (Irving, 1990; Pinhas, Toner, Ali, Garfinkel, & Stuckless, 1999; Stice & Shaw, 1994). "For many women, weight is a quick and concrete barometer by which to measure oneself and one's worth—how well one is doing as a woman" (Rodin et al., 1985, p. 290). We believe this effect needs to be shared with advertisers and other marketers as they are called to account for the necessity of promoting an unhealthy body ideal to sell products (Kilbourne, 1999).

Unfortunately, one half the studies included in the meta-analysis did not measure dispositional body dissatisfaction before exposing participants to images of the thin ideal. Nevertheless, a meta-analysis of the remaining studies strongly suggests that the negative effect of those images is enhanced when the females exposed to them are vulnerable because they have already internalized the slender beauty ideal (Cattarin, Thompson, Thomas, & Williams, 2000; Heinberg & Thompson, 1995) and/or they already have a high level of body dissatisfaction and shape concerns (Posavac et al., 1998). Contrary to expectation, effect size appeared to be greatest with only a few exposures, not with 10 or more exposures. These two findings imply that the experimental effect is seen most clearly in the activation—not the cultivation—of a thinness schema in females who are highly motivated and cognitively prepared to think about themselves in relation to weight, shape, and beauty.

Along the same lines, the mean effect size was somewhat greater for females younger than 19. There is a clear need for more experimental research with participants at various developmental stages and with various pre-existing levels of negative body image and weight concerns. Together, the three main experimental findings also support the need for longitudinal, correlational research to test the following hypothesis: The glorification of slenderness omnipresent in magazines targeting young adolescent girls (Levine & Smolak, 1996) will have its most deleterious effect (a) during or immediately after the early adolescent transition and (b) on girls who are entering that transition already possessing a strong investment in thinness and beauty (Levine & Smolak, 1998; Smolak & Levine, 1996). Martin and colleagues (Martin & Gentry, 1997; Martin & Kennedy, 1993) have shown that girls ages 13–14 are more likely to compare themselves to slender models than girls ages 9–10 and that females ages 10–25 who have low self-esteem and poor body image are particularly likely to seek out and "enjoy" advertisements with slender, attractive models.

The principal findings of this meta-analysis have two other important implications. First, theory and research need to elucidate why girls and women are motivated to read fashion magazines (sometimes against their better judgement; Then, 1992) and how images of slender beauty affect females in general and some females in particular (Levine, Piran, & Stoddard, 1999; Levine & Smolak, 1996, 1998). One critically important construct that has received insufficient attention to date is social comparison. A majority of females ages 8 through 18 compare themselves to the models appearing in the advertisements and fashion layouts in beauty magazines for girls and women (Martin & Kennedy, 1993, 1994). Elementary and middle school girls who read fashion magazines and compare themselves to the models also report greater body dissatisfaction and higher levels of disordered eating (Field, Carmago, Taylor, Berkey, & Colditz, 1999;

Levine, Smolak, & Hayden, 1994). Stormer and Thompson (1996) found that individual differences in the motive for social comparison of one's appearance with others are significantly correlated with various measures of negative body image. Moreover, there is evidence that female undergraduates with high levels of weight and shape concern tend to emphasize appearance and weight in evaluating other women (Beebe, Hombeck, Schober, Lane, & Rosa, 1996). The complexity of transaction between perceiver and stimulus images is also seen in the recent finding that Australian undergraduate women who had weight and shape concerns judged thin celebrities to be thinner than those models actually were, an underestimation not seen in undergraduates unconcerned about shape (King, Touyz, & Charles, 2000).

Cattarin et al. (in press) found that, relative to a condition in which college women focused on some other aspect of televised commercials, women who were instructed to focus on the thin, attractive models reported more immediate appearance dissatisfaction. In a more refined analysis, social comparison theorists typically distinguish three types of motives for social comparison: self-evaluation, self-improvement, and self-(or ego)-enhancement (Wood, 1989). Martin and Gentry (1997) found that girls ages 9–14 who were instructed to compare their own physical attractiveness to that of slender models (for the purpose of self-evaluation) felt less physically attractive afterward. Conversely, girls instructed to think about slender models in ways that inspire self-improvement or enhance the girls' perceptions of their own, personal beauty felt more physically attractive after seeing the models. All these findings indicate that an expanded application of social comparison theory and methodology will be crucial for understanding the effects of images of slender beauty.

The second important implication of this meta-analysis concerns the potential utility of media literacy in the primary or secondary prevention of negative body image (Berel & Irving, 1998; Levine et al., 1999). Media literacy refers to a cycle of critique that includes awareness of media use, analysis of content and intentions, and action in the form of activism toward media or advocacy using media (Levine et al., 1999; Piran, Levine, Irving, & EDAP, Inc., 2000). With regard to secondary prevention, Posavac et al. (in press) found that female college students with negative body image who were given a 7-min psychoeducational presentation involving media analysis were less likely to engage in social comparison and less likely to be negatively affected by images of slender beauty than were students who saw the same images without prior inoculation. As predicted by a sociocultural perspective (Levine et al., 1999; Stice, 1994; Thompson & Stice, 2001), the most effective form of several pre-exposure conditions evaluated by Posavac et al. (in press) emphasized the clash between the artificial, constructed nature of slender beauty in the media versus the diversity of actual women's weight and shapes, as well as the negative effects of dieting. Studies of media literacy in primary prevention (Irving, DuPen, & Berel, 1998; Piran et al., 2000) have not progressed beyond the pilot phase, but, coupled with other research demonstrating the value of challenging cultural ideals (Stice, Mazotti, Weibel, & Agras, 2000), they are encouraging enough to warrant further investigation of this approach.

The present study supports the trend toward using the technique of meta-analysis to evaluate theoretical propositions and methodological issues concerning influences on body image and disordered eating (Murnen & Smolak, 1997; Smolak, Murnen, & Ruble, 2000). The first author is currently applying the technique to cross-sectional (Harrison & Cantor, 1997; Levine et al., 1994) and longitudinal (Stice, 1998) analyses of the correlation between body dissatisfaction, disordered eating, and level and type of media use.

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