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The Role of the Media in Body Image Concerns Among Women: A Meta-Analysis of Experimental and Correlational Studies

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Research suggests that exposure to mass media depicting the thin-ideal body may be linked to body image disturbance in women. This meta-analysis examined experimental and correlational studies testing the links between media exposure to women's body dissatisfaction, internalization of the thin ideal, and eating behaviors and beliefs with a sample of 77 studies that yielded 141 effect sizes. The mean effect sizes were small to moderate (*d*s = –.28, –.39, and –.30, respectively). Effects for some outcome variables were moderated by publication year and study design. The findings support the notion that exposure to media images depicting the thin-ideal body is related to body image concerns for women.

Keywords: body image, media, advertising, human females, meta-analysis

Body dissatisfaction has reached normative levels among American girls and young women. Approximately 50% of girls and undergraduate women report being dissatisfied with their bodies (e.g., Bearman, Presnell, & Martinez, 2006; Monteath & McCabe, 1997). These perceptions develop relatively early, emerging among children as young as age 7 years, and appear to exist across diverse levels of body size and race (Dohnt & Tiggemann, 2006a; Grabe & Hyde, 2006). These feelings are not inconsequential; they have been linked to critical physical and mental health problems. Research from prospective and longitudinal designs has identified body dissatisfaction as one of the most consistent and robust risk factors for eating disorders such as bulimia and as a significant predictor of low self-esteem, depression, and obesity (Grabe, Hyde, & Lindberg, 2007; Johnson & Wardle, 2005; Neumark-Sztianer, Paxton, Hannan, Haines, & Story, 2006; Paxton, Neumark-Sztianer, & Hannan, 2006; Tiggemann, 2005). Thus, in many ways, body dissatisfaction has emerged as a core aspect of women's physical and mental health.

Why is it that so many girls and young women are dissatisfied with their bodies, regardless of the size? Among the many forces believed to play a role (in addition to parental messages and peer-related teasing) is the increasingly thin ideal dominating the media. Across movies, magazines, and television programs, thinness is consistently emphasized and rewarded for women (e.g., Fouts & Burggraf, 1999), and thin television characters are overrepresented while overweight characters are underrepresented (e.g., Fouts & Burggraf, 1999, 2000; Greenberg, Eastin, Hofschire, Lachlan, & Brownell, 2003). Indeed, the images of women presented in the media today are thinner than past media images of women (Silverstein, Perdue, Peterson, & Kelly, 1986), thinner than the actual female population (e.g. Fouts & Burggraf, 1999, 2000), and often thinner than the criteria for anorexia (Wiseman, Gray, Moismann, & Ahrens, 1992). This ideal is pervasive, with fashion models, cartoon characters, movie and television actresses, *Playboy* centerfolds, and Miss America Pageant winners all having become increasingly thinner over the past decades (Garner, Garfinkel, Schwartz, & Thompson, 1980; Klein & Shiffman, 2005; Morris, Cooper, & Cooper, 1989; Silverstein et al., 1986; Spitzer, Henderson, & Zivian, 1999). Thus, media aimed at girls, adolescents, and young women are replete with extremely thin models that portray an ideal that is unattainable to most.

According to communications theories, repeated exposure to media content leads viewers to begin to accept media portrayals as representations of reality (e.g., cultivation theory: Gerbner, Gross, & Morgan, 2002; social learning theory: J. D. Brown, 2002). In this case, it is believed that the media's consistent depiction of a thin ideal leads women to see this ideal as normative, expected, and central to attractiveness. However, because media presentations of women's bodies are so skewed, showcasing an ideal that is out of reach to most, adopting this reality may lead to decreased satisfaction with one's own body (e.g., Levine & Harrison, 2004) and to behaviors aimed at meeting this ideal, behaviors such as dieting, bingeing and purging, and skipping meals. A growing body of research has begun to investigate these claims, testing how both laboratory and natural exposure to the thin ideal shapes young women's internalization of this ideal, body dissatisfaction, and disordered eating. Research in this area has produced more than 100 studies whose findings not only demonstrate the proposed links but also provide evidence that body image disturbance prospectively predicts eating pathology (e.g., Stice & Shaw, 2002)

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and that treatment interventions aimed at reducing body image disturbance can produce reductions in bulimic pathology (e.g., Bearman, Stice, & Chase, 2003). Thus, in the following review we focus on body image dissatisfaction and related concerns, among which we include behaviors and beliefs about eating and dieting.

The majority of studies examining connections between media use and women's body image and related issues have been experimental laboratory studies that examine whether exposure to thin-ideal media increases body dissatisfaction or related concerns in the short term (e.g., Tiggemann & Slater, 2003). These types of designs, in which participants are randomly assigned to conditions, are often believed to offer the most conclusive evidence regarding media effects on psychological outcomes (C. A. Anderson et al., 2003). However, although experiments of this type contribute significantly to our understanding of media effects on body image and related concerns, they also include a level of artificiality that limits their external validity. As such, findings from laboratory studies may be especially valuable when they are combined with results obtained from naturalistic, correlational studies in which participants report their actual media use. However, findings from these correlational surveys are also limited in that they cannot indicate whether thin-ideal media cause negative body image outcomes, whether women with poor body image are drawn to thin-ideal media, or whether some other factor creates both conditions. Neither method, then, provides unequivocal findings regarding the role of the media in women's body image concerns. The combination of the two, however, can provide converging evidence. Although longitudinal and prospective studies can enhance confidence in the conclusions drawn, this area of research is relatively new, and therefore, the number of such studies is small. As a result, what follows is a review of the experimental and correlational research examining the link between media use and women's body image and related concerns.

Experimental Research

The majority of studies in this area have used experimental methods to test whether women feel worse about their bodies after exposure to thin media models than after exposure to other types of images (e.g., Dittmar & Howard, 2004). In a typical experiment, women are shown a series of magazine or television advertisements that contain either images of the thin-ideal body (experimental condition) or images that are considered neutral (e.g., furniture; control condition). Following the experimental manipulation, respondents are asked to complete assessments of body-image-related constructs. Although experiment-based media exposure cannot approximate the massive bombardment that occurs naturally, a particular strength of this method is the potential for causal inferences regarding the nature of the relation between the media manipulation and women's body image.

Using this paradigm, body-image researchers have repeatedly shown that women who view thin-ideal images in the lab experience lower body satisfaction than do women who view neutral images (e.g., Birkeland, Thompson, & Herbozo, 2005). For example, findings among both adolescent and adult women indicate that participants who viewed magazine ads featuring the thin-ideal body type reported significantly greater body dissatisfaction than did those who viewed neutral ads (e.g., Halliwell & Dittmar, 2004). Similar findings have been demonstrated with televised media. For example, exposure to television commercials that feature the thin-ideal image (as opposed to average-weight women or nonappearance-related content) increases women's body dissatisfaction (e.g., Hargreaves & Tiggemann, 2004) and eating disorder symptomatology (e.g., Strahan, 2003). Similar results have been obtained after the viewing of music videos (Tiggemann & Slater, 2003). Thus, a growing body of experimental research indicates that exposure to thin-ideal models leads to increased body dissatisfaction and eating disorder symptomatology.

Other research, however, suggests that this is not invariably the case and that experimental effects of exposure to the thin ideal are not universal. First, certain factors make some women more vulnerable than others to the effects of media exposure (e.g., acceptance of societal attitudes toward female attractiveness; Heinberg & Thompson, 1995). For example, it has been demonstrated that prior levels of body dissatisfaction moderate women's responses to media images such that women who are initially dissatisfied with their bodies are most sensitive to the adverse effects of media exposure (Posavac, Posavac, & Posavac, 1998). Second, other studies have found little to no immediate effect of thin-ideal media portrayals on women's body image or related concerns (e.g., Halliwell, Dittmar, & Howe, 2005). Similarly, null effects have been reported for exposure to thin-ideal ads and adolescent girls' self-reported physical attractiveness (Martin & Kennedy, 1993), adult women's body satisfaction (Irving, 1990), and endorsement of dieting attitudes and behaviors (Thornton & Maurice, 1997). Third, a few studies have reported that media exposure is negatively related to dissatisfaction—in other words, after viewing appearance-focused stimuli, women's dissatisfaction decreased (e.g., Coolican, 1999; Cusumano & Thompson, 1997). Overall, however, many well-controlled, randomized experiments have demonstrated an effect of the thin-ideal media on women's body image and related concerns in samples of varying ages with a number of different outcome measures. Although some null or conditional outcomes emerge, the majority of evidence from these experiments indicates that brief exposure to media images depicting the thin-ideal body often leads to short-term adverse outcomes in women's body image and related concerns.

Correlational Research

The second set of studies in this research area uses naturalistic, correlational data to investigate the relationship between women's media consumption and their body dissatisfaction and related issues (e.g., Bissell & Zhou, 2004; Jones, Vigfusdottir, & Lee, 2004). Here, findings indicate that more frequent exposure to fashion magazines or to television programming featuring the thin-ideal body type is associated with higher levels of body dissatisfaction and eating disorder symptomatology among girls and women (e.g., D. R. Anderson, Huston, Schmitt, Linebarger, & Wright, 2001; Bissell & Zhou, 2004; Jones et al., 2004; Morry & Staska, 2001; Sands & Wardle, 2003; Stice, Schupak-Neuberg, Shaw, & Stein, 1994; Thomsen, 2002). Similar relations have been demonstrated between generalized media use (Abramson & Valene, 1991) or music television viewing (e.g., Hofschire & Greenberg, 2001) and body image dissatisfaction.

With few exceptions, then, correlational research appears to demonstrate a positive relation between media consumption and body dissatisfaction among women (see Cusumano & Thompson,

1997, for an exception). These correlational studies illustrate that regular exposure to thin-ideal media is frequently associated with comparatively higher levels of negative body image outcomes. Although causal inferences cannot be drawn, these findings complement the conclusions of the experimental studies and suggest that the short-term effects found in controlled settings may be generalizable outside of the laboratory.

Meta-Analysis

Although findings from experimental and correlational studies suggest important connections between women's media use and their body image and related concerns, significant questions remain. How strong and consistent are these links, especially given the presence of some null results? In what contexts are they most relevant? Because a close inspection of individual articles reveals use of varying stimuli, outcome measures, and methodology, a firm understanding of the association between thin-ideal media exposure and body image concerns among women is lacking. Methodological differences in measurement and design type, the presence of moderating factors, or simple random error that leads to effect sizes of varying magnitude make it difficult to draw generalizable conclusions. Meta-analytic work that allows for the quantitative combination of all relevant data can estimate the magnitude of the effects, analyze variations in study outcomes, and investigate potential moderators of the relation between media effects and body image.

Researchers have attempted to analyze this body of research with just that aim, but the conclusions are somewhat inconsistent. In one meta-analysis of 25 experimental studies investigating the effects of media exposure on female body image (including only generalized dissatisfaction measures), the authors reported an effect size of $d = -.31$ across all studies, indicating that women feel worse after exposure to thin images versus neutral images (Groesz, Levine, & Murnen, 2002). However, in a second meta-analysis examining a similar question, Holmstrom (2004) analyzed findings from 34 studies (mixed experimental and correlational) and reported a notably smaller effect ($r = -.08$), suggesting that there is little influence of media exposure on women's body image. Because these reviews did not converge on similar findings, there remains a need to examine the issue more closely. Furthermore, neither meta-analysis reflects a comprehensive review of current research. For example, Groesz et al. (2002) included only experimental research, and of the 34 studies included in the Holmstrom review, only 9 overlapped with those in the Groesz et al. review. In addition, neither review included unpublished research, leading to concerns about the file drawer problem (i.e., studies that were conducted but never published; Rosenthal, 1979). Moreover, despite the relative recency of these meta-analyses, an updated review is warranted to reflect the rapidly growing number of articles accumulating in this area of study. Finally, although the Holmstrom review investigated four body image constructs (importance of appearance, eating pathology and restrained eating, body dissatisfaction, and endorsement of the thin ideal), the author reported an overall effect size collapsed across measures, thereby limiting our understanding of how media use may contribute differently to different outcomes.

Therefore, the current meta-analysis sought to improve upon the two previous reviews in several important ways: (a) we included a much larger sample of studies despite more stringent inclusion criteria ($N = 77$); (b) we obtained and included unpublished studies; (c) we reviewed both controlled experiments and correlational studies; and (d) we viewed body image and related concerns as multidimensional and therefore grouped our analyses on the basis of four outcomes.

Measurement of Body Image and Eating Behaviors and Beliefs

What is perhaps the greatest challenge to drawing sound conclusions from this large and growing literature is that results may vary depending on the particular dimension of body image or related eating behavior that is being measured. Researchers have come to realize that body image concerns are multidimensional and include thoughts, feelings, and behavioral responses related to one's body (Thompson & van den Berg, 2002). Thus, in the burgeoning study of the media's thin ideal, different components of body image and related consequences such as disordered eating behaviors have gained increasing attention since the 1990s. Given this complexity, it is common for researchers to include in one study several measures of body image or related constructs. For example, researchers routinely use a body dissatisfaction measure, a disordered eating measure, and a thin-ideal internalization measure in one study (e.g., Stice, Spangler, & Agras, 2001). Some studies report consistent results across constructs (e.g., Bissell & Zhou, 2004; Dunkley, Wertheim, & Paxton, 2001; Morry & Staska, 2001), whereas others do not (e.g., Cusumano & Thompson, 1997). For example, in some experimental studies researchers report stronger media effects on internalization of the thin ideal (Jones, Vigfusdottir, & Lee, 2004) and eating disorder symptomatology (e.g., Tiggemann, 2003) than on body dissatisfaction. To complicate matters further, opposite results have been demonstrated within the same study. Hawkins, Richards, Granley, and Stein (2004) reported that exposure to thin-ideal magazine images increased body dissatisfaction and negative mood among college women but decreased internalization of the thin ideal. Thus, the combination of null results and mixed results across constructs makes it difficult to determine what construct related to body image is most strongly linked to media exposure and points to the importance of meta-analysis to sort out these findings.

In the current review we treated body image and related concerns as multidimensional and examined the effects separately for four outcomes related to body image. The first is body satisfaction/dissatisfaction, which represents a global and subjective evaluation of one's body. Based on a review of published measures of body image satisfaction and related constructs, Thompson and van den Berg (2002) defined two additional dimensions of body image: cognitive and behavioral. The authors argued that the cognitive component of body image attempts to capture beliefs, thoughts, and attributions of body image by measuring constructs such as self-attentional focus, investment in one's appearance, and internalization of social stereotypes regarding appearance. In our review, we broke this category down further by distinguishing between (a) self-attentional focus or preoccupation with the body and self-objectification (i.e., adopting a view of oneself as an object whose value is based on appearance), which we believe to reflect more clearly a degree of dysfunctional cognitive schema, and (b) internalization of thin ideals, which we view as the adoption of

sociocultural appearance ideals as a personal goal and standard. Finally, Thompson and van den Berg defined behavioral measures as those that assess participants' behaviors related to body image. Given the large literature on eating disorders, we focus specifically on behaviors related to eating but also broaden this category to include beliefs related to eating because many measures assess participants' beliefs and attitudes as well as behaviors (e.g., "Feel extremely guilty after eating").

Method

Measures

We grouped our review of the relevant studies into the following four categories of outcome variables: (a) body dissatisfaction, (b) body self-consciousness/objectification, (c) internalization of the thin ideal and drive for thinness, and (d) eating behaviors and beliefs. When a study included more than one measure within a category, effect sizes were calculated separately and then averaged in order to produce one effect size per outcome variable of interest.

In the category of body dissatisfaction we focused on measures that assess the evaluative component of body image, that is, satisfaction/dissatisfaction with the body. The following scales were classified as measures that assessed dissatisfaction with the body and were included in the current review: (a) the Visual Analogue Scales (Heinberg & Thompson, 1995), (b) the Body Dissatisfaction Subscale from the Eating Disorders Inventory (Garner, Olmsted, & Polivy, 1983); (c) the Body Satisfaction Questionnaire (Berscheid, Walster, & Bohrnstedt, 1973), (d) the Body Esteem subscale of the Body Image Scale (Conner, Martin, Silverdale, & Grogan, 1996), (e) the Physical Appearance State and Trait Anxiety Scale (Reed, Thompson, Brannick, & Sacco, 1991), (f) the Body Esteem Scale (Franzoi & Shields, 1984); (g) the Appearance Self-Esteem subscale of the Current Thoughts Scale (Heatherton & Polivy, 1991); (h) the Multidimensional Body–Self Relations Questionnaire (T. A. Brown, Cash, & Mikulka, 1990); (i) the Body Shape Questionnaire (Cooper, Taylor, Cooper, & Fairburn, 1987); (j) the Figure Rating Scales (Stunkard, Sorenson, & Schlusinger, 1983); (k) the Body Image States Scale (Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002); (l) the Body Satisfaction Scale (Slade, Dewey, Newton, Brodie, & Kiemle, 1990); (m) the Body Attitudes Questionnaire (Ben-Tovim & Walker, 1991); and (n) the Body Esteem Scale (Mendelson & White, 1985). In addition to these scales, a variety of scales that were not standardized but were specifically described as measuring global body dissatisfaction were included. A total of 90 studies yielded effect sizes for body dissatisfaction.

The following scales assessed body self-consciousness or self-objectification regarding the body and were included in the current review: (a) the Body Self-Consciousness Questionnaire (Miller, Murphy, & Buss, 1981); (b) the Self-Objectification Questionnaire (Noll & Fredrickson, 1998); and (c) the Body Surveillance Scale (McKinley & Hyde, 1996). Despite prominent theoretical analyses of these constructs, only eight studies were available to compute effect sizes for this outcome variable. Because eight studies is typically too few to warrant meta-analyses, we did not retain this category as a main outcome of interest in our final analyses.[1]

Measures that assess internalization of the thin ideal generally measure how strongly individuals value thinness for themselves and for others. The following scales assessed internalization of the thin ideal and drive for thinness and were included in the current review: (a) the Drive for Thinness subscale of the Eating Disorders Inventory (Garner et al., 1983), (b) the Ideal-Body Stereotype Internalization Scale (Stice et al., 1994), (c) the Internalization of Thin Ideal subscale of the Sociocultural Attitudes Towards Appearance Scale (Heinberg, Thompson, & Stormer, 1995), (d) the Internalization subscale of the Multidimensional Media Influence Scale (Cusumano & Thompson, 2001), and (e) the Appearance Schemas Inventory (Cash & Labarge, 1996). There were 23 studies that yielded effect sizes for this component of body image.

Finally, we also included measures that focused on girls' and women's restrained eating, excessive exercise, or bingeing and purging. The following scales assessed eating behaviors and beliefs: (a) the Bulimia subscale of the Eating Disorders Inventory, (b) the Eating Disorder Diagnostic subscale (Stice, Telch, & Rizvi, 2000), (c) the Eating Disorder Examination Questionnaire (Fairburn & Belgin, 1994), (d) the Bulimia Test (Smith & Thelen, 1984), (e) the 26-item Eating Attitudes Test (Garner, Olmsted, Bohr, & Garfinkel, 1982), (f) the Children's Eating Attitudes Test (Maloney, McGuire, & Daniels, 1988), (g) the Anorexia Bulimia Inventory (Stein, 1991), (h) the Mizes Anorectic Cognitions Scale (Mizes, 1990), and (i) the Dutch Eating Behavior Questionnaire (Van Strien, Frijters, Bergers, & Defares, 1986). There were 20 datasets that yielded effect sizes for eating behaviors and beliefs.

Measurement of Media Use

Because our goal was to test directly the association between the use of media and women's body image and related concerns, we included only those studies that investigated media use or media exposure, as opposed to self-report of media influence (i.e., perceived pressure from media to change exercise or eating patterns). Experimental studies were included only if there were appearance-focused and control media conditions. In other words, it was required that both groups were exposed to some media. In most cases the appearance-focused conditions manipulated exposure through images taken from contemporary women's fashion magazines, television commercials, or television programming that was appearance-focused. Control conditions most often used nonappearance ads from the same magazines or network stations, but in some cases they used average or overweight models as the control condition. When a study included all three conditions (i.e., thin-ideal models, average or overweight models, and nonappearance/object controls), the nonappearance or object condition was chosen as the control because that was the comparison occurring most regularly in the literature. Studies were not included if the control group was not exposed to any media (e.g., Thornton & Maurice, 1997), if specific instructions were given for participants to compare themselves with the models (e.g., two subsamples in Tiggemann & McGill, 2004), or if the media manipulation was an

[1] Although the number of studies investigating the link between the media and objectification is relatively low, in the interest of reporting a full analysis of the current literature we offer a weighted mean effect size for the effect of media exposure on women's body self-consciousness or self-objectification of −0.30 (95% CI −0.16 to −0.44) that should be interpreted with caution. We nevertheless include these preliminary findings because they allow us to view the gaps in the literature.

intervention aimed at reducing eating disorder symptomatology or body dissatisfaction (e.g., Posavac, Posavac, & Weigel, 2001).

Correlational studies were included if participants' media consumption was directly assessed. The most commonly used method was to assess frequency of fashion magazine reading and viewing of television programming with a thin-ideal focus. It was also common to assess media usage by measuring general media exposure (i.e., the number of hours per week that participants read newspapers or magazines, watched television or movies, or listened to the radio).

Sample of Studies

We used multiple methods to obtain relevant research. First, a computerized database search of PsycINFO and the Web of Science was conducted to generate a pool of potential articles. To identify all articles that investigated the link between media use and body image concerns, the words *body image, media, television, advertising,* and *magazines* were used as key terms in the literature search. These broad terms were selected to capture the wide range of research that has been conducted. Search limits restricted the results to articles published in English between 1975 and January 2007 and included studies conducted in English-speaking countries (e.g., the United States, Canada, Great Britain, and Australia). Appearance ideals can vary widely across cultures, yet little research has been conducted in other cultures. We therefore restricted ourselves to these four closely related cultures in which there is substantial research and often shared media. Second, several reference lists were searched for relevant studies, including prior reviews (e.g., Groesz, Levine, & Murnen, 2002; Holmstrom, 2004; Ward & Harrison, 2005). Third, we conducted a computerized search of PsycINFO for the years 1975 through January 2007 to identify unpublished dissertations.

Abstracts were printed, examined, and excluded on the basis of any of the following criteria: (a) the article did not describe an empirical study; (b) the article did not present original data; (c) the study was not conducted on an English-speaking sample; (d) the article did not contain a relevant measure of body image; (e) the article did not focus on TV, magazine, or movie content (whether correlational or experimental); and (f) participants were preselected on the basis of scores from a clinical assessment. In addition, because gender differences in body dissatisfaction have been established in prior meta-analytic work (e.g., Feingold & Mazzella, 1998) and the bulk of research investigating the effects of the thin ideal has been conducted on women (Dittmar, 2005), we included studies of only female samples. We photocopied the articles that met the criteria and examined them to determine whether they presented sufficient statistics for an effect-size calculation. Dissertations were ordered via interlibrary loan and reviewed at the receiving library.

The studies used in the two prior reviews were carefully coded, and several were excluded from the current review to capture more precisely the role of media in body image and related concerns. Fifteen articles from the two prior reviews were not included in the current study for the following reasons: (a) only beta weights from multiple regressions had been used as opposed to correlations representing the relation between media use and body image (e.g., Botta, 1999, 2000; Harrison, 1997; E. Henderson-King & Henderson-King, 1997; Jane, Hunter, & Lozzi, 1999)[2]; (b) the methodology was not appropriate, for example, when participants were exposed to both the experimental and control conditions (e.g., Hamilton & Waller, 1993; Waller, Hamilton, & Shaw, 1992) or the experimental manipulation included more than exposure to media conditions (e.g., unique instructions; Martin & Gentry, 1997), (c) the media measure did not meet our criteria (e.g., assessed perceived influence of media as opposed to media consumption, Vartanian, Giant, & Passino, 2001), (d) the outcome measure did not fit into one of the four categories we delineated (e.g., Myers & Biocca, 1992; Tan, 1979), or (e) the study was an unpublished paper presented at a conference (more than 7 years ago) and was therefore unavailable.

Efforts to obtain additional data. If articles were deemed eligible but did not provide adequate information for coding (e.g., means and standard deviations for separate conditions were omitted, precluding effect size computation) and were not more than 7 years old, we contacted the authors for the information via electronic mail. Electronic mail addresses were obtained from the articles' contact information, authors' academic institution's Web directory, or from a Google search. We contacted the first authors of 23 articles. Of those, 6 (30%) provided usable data and 6 could not be reached.

Coding the studies. The following information was coded for each study: (a) the type of media (magazine, television, or generalized mass media); (b) the research design (experimental or correlational); (c) the type of outcome measure used (body dissatisfaction, body self-consciousness/self-objectification, internalization of thin ideal, or eating attitudes and behaviors); (d) whether participants were recruited from eating disorder clinics or had a history of body dissatisfaction; (e) all statistics on group differences or correlations, including means, standard deviations, *t* values, *F* values, and *r* values; (f) the mean age of the respondents (if age was not reported, the following rules were used to generate an estimate: if a range was given, the mean age was assumed to be the median; if grade levels were given, 5 years was added to the grade level; if the respondents were described as undergraduates, the mean age was assumed to be 20); and (g) the date of publication.

Final sample of studies. The search and review procedures led to a final sample of 77 articles from 32 different journals as well as dissertations. These studies comprised 15,047 participants and yielded 141 effect sizes. See Table 1 for studies included in the meta-analysis and Table 2 for a summary of characteristics of the studies. Shelly Grabe coded all articles, and Janet Shibley Hyde double-coded 25% of them. We obtained 100% agreement on the outcome measure used, the study design, and the type of media measure used. Cohen's kappa values for sample size and the reported parameter values (i.e., correlation or means and standard deviations) were .95 and .86, respectively. Discrepancies were resolved by discussion after a review of the article.

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[2] We did not use β from hierarchical regressions because results from β often included a number of covariates that would not allow us to compare effect sizes. In other words, results from studies that include various other factors in a regression render the final parameter values incomparable to each other. Inclusion of these studies could potentially underestimate the overall average effect size. Furthermore, when possible, the control variables that are partialed out in a regression analysis as "nuisance variables" may prove to be interesting moderators (e.g., age). The authors of the cited studies were e-mailed to request point biserial correlations.

Table 1
Effect Size Estimates and Moderator Variables

Study	*d*	*N* E	*N* C	*N* S	Mean age (yrs)	Study design	Media type	Type of control	Measure
Abramson & Valene (1991)	−.45			101	21.8	Correlational	Generalized media		Bulimia Scale
Anderson et al. (2001)	−.61			283	17.4	Correlational	Entertainment television		Weight Dissatisfaction
Aubrey (2006)									
Time 1	−.17			149	19.6	Correlational	Television		Self-Objectification
	.01			149	19.6	Correlational	Magazines		Self-Objectification
Time 2	−.08			97	20.6	Correlational	Television		Self-Objectification
	−.12			97	20.6	Correlational	Magazines		Self-Objectification
Becker et al. (2002)				128	17	Experiment	Television	Duration	Years of exposure
Birkeland et al. (2005)									
Appearance product conditions	−.59	35	34		21.8	Experiment	Magazines		VAS
Neutral product conditions	−.33	35	34		21.8	Experiment	Magazines		VAS
Bissell & Zhou (2004)	−.47			218	19	Correlational	Television		EAT
	−.35			218	19	Correlational	Television		BDS-EDI
	−.43			218	19	Correlational	Television		DT- EDI
Borowiak (2003)[a]	−.30	100	98		20	Experiment	Television commercials	Object	BES
Borzekowski et al. (2000)	−.16			837	14.9	Correlational	Music television		Weight and Shape Concerns
A. Brown & Dittmar (2005)	−.43	25	27	52	21.23	Experiment	Magazines	Objects	SATAQ
	−.70	25	27	52	21.23	Experiment	Magazines	Objects	PASTAS
Cash et al. (1983)	−.38	17	17	34	22.7	Experiment	Magazines	Average weight	Body Satisfaction Questionnaire
Cattarin et al. (2000)	−.56	90	90		22.97	Experiment	Television commercials	Average weight	VAS
Clay et al. (2005)	−.56	68	68	136	13.5	Experiment	Magazines	Objects	Body Dissatisfaction
Coolican (1999)[a]	.04	40	37		20	Experiment	Baywatch	News	Body Dissatisfaction
Crouch & Degelman (1998)	−.68	20	20		15.4	Experiment	Magazines	Overweight	Self-Attractiveness
Cusumano & Thompson (1997)									
	.14			175	24	Correlational	Magazines		BDS-EDI
	.08			175	24	Correlational	Magazines		BUL-EDI
	−.03			175	24	Correlational	Magazines		Internalization/Drive for Thinness
Dittmar & Howard (2004)									
	−.36	50	50		32.7	Experiment	Magazines	Objects	SATAQ
	−.48	50	50		32.7	Experiment	Magazines	Objects	PASTAS
Dohnt & Tiggemann (2006a)									
	.03			128	7.5	Correlational	Television		Body Dissatisfaction
	.22			128	7.5	Correlational	Magazines		Body Dissatisfaction
Dunkley et al. (2001)									
	−.35			567	15.5	Correlational	Magazines		Body Attitudes Questionnaire
	−.26			567	15.5	Correlational	Magazines		DEBQ
Durkin & Paxton (2002)									
Grade 7	−.22	74	42		12.9	Experiment	Magazines	Objects	VAS
Grade 10	−.33	67	58		15.5	Experiment	Magazines	Objects	VAS
Esteban (2003)[a]	−.46	112	112		20	Experiment	Magazines		BES
Frisby (2004)	−.08	48	48		19.9	Experiment	Magazines	No control	BES
Grogan et al. (1996)	−.15	23	22		20	Experiment	Magazines	Objects	BE-BIS
Halliwell & Dittmar (2004)	−.32	78	59		30.8	Experiment	Magazines	Objects	PASTAS
Halliwell et al. (2005)	.06	24	25		32	Experiment	Magazines	Object	PASTAS
Hargreaves & Tiggemann (2002)									
Normal viewing	−.24	50	50		16	Experiment	Television commercials	Object	VAS
Distracted viewing	−.15	50	50		16	Experiment	Television commercials	Object	VAS
Hargreaves & Tiggemann (2003a)	−.39	23	19		15.5	Experiment	Television commercials	Object	VAS
Hargreaves & Tiggemann (2003b)	−.71	80	80		14	Experiment	Television commercials	Object	ASI
Hargreaves & Tiggemann (2004)	−.64	75	80		14.3	Experiment	Television commercials	Object	VAS

Table continues

Table 1 (*continued*)

Study	*d*	*N* E	*N* C	*N* S	Mean age (yrs)	Study design	Media type	Type of control	Measure
Harrison (2000)	−.12			178	14.6	Correlational	Magazines		BDS-EDI
	−.35			178	14.6	Correlational	Magazines		DT-EDI
	−.37			178	14.6	Correlational	Magazines		chEAT
Harrison & Cantor (1997)	−.63			232	20	Correlational	Magazines		EAT
Hawkins et al. (2004)	−1.01	74	71		20	Experiment	Magazines	Objects	BDS-EDI
	.29	74	71		20	Experiment	Magazines	Objects	SATAQ
	−.50	74	71		20	Experiment	Magazines	Objects	Anorexia Bulimia Inventory
Heinberg & Thompson (1995)									
High body dissatisfaction	−.71	31	29	20		Experiment	Television commercials	Objects	VAS
Low body dissatisfaction	−.03	39	38	20		Experiment	Television commercials	Objects	VAS
D. Henderson-King, Henderson-King, & Hoffmann (2001)									
Study 1	−.13	114	114		19	Experiment	Magazines	Objects	BES
Study 2									
Importance of attractiveness—high	−.64	56	56		19	Experiment	Magazines	Objects	BES
Importance of attractiveness—low	.26	56	56		19	Experiment	Magazines	Objects	BES
Hofschire & Greenberg (2001)	−.32			71	15.5	Correlational	Music video		General Body Dissatisfaction
	−.54			71	15.5	Correlational	Magazines		General Body Dissatisfaction
	−.32			71	15.5	Correlational	Thin-ideal TV programming		Endorsement of Thin Ideal
Irving (1990)	.02	41	38		20	Experiment	Magazines	Objects	BES
Jones et al. (2004)									
	−.30			430	13.6	Correlational	Magazines		BDS-EDI
	−.61			430	13.6	Correlational	Magazines		SATAQ
Joshi et al. (2004)									
Restrained eaters	.44	15	15		20.25	Experiment	Magazines	Objects	Appearance Self-Esteem
Unrestrained eaters	−1.0	16	15						
Kalodner (1997)	−.40	32	29		18.97	Experiment	Magazines	Average weight	Body Self-Consciousness
Kozak (2001)[a]	−.12			182	10.08	Correlational	Thin-ideal TV programming		FRS
Lavin & Cash (2000)	−.71	32	34	20		Experiment	Generalized media	Object	VAS
Lavine et al. (1999)	−.45	29	28		19.31	Experiment	Television commercials	Object	FRS
Lin & Kulik (2002)	−.65	22	23	20		Experiment	Magazines	Overweight	BPSS
Martin & Kennedy (1993)	−.05	48	48		12	Experiment	Magazines	Object	Physical Attractiveness
Mills et al. (2002)									
Restrained eaters	.97	13	19		19.73	Experiment	Magazines	Object	Appearance Self-Esteem
Unrestrained eaters	−.87	15	26		19.72	Experiment	Magazines	Object	Appearance Self-Esteem
Monro & Huon (2005)									
High self-objectifiers	−.27	18	18		20	Experiment	Magazines	Object	VAS
Low self-objectifiers	−.61	18	18		20	Experiment	Magazines	Object	VAS
Morry & Staska (2001)	−.54			89	18.8	Correlational	Magazines		Self-Objectification
	−.49			89	18.8	Correlational	Magazines		EAT
	−.56			89	18.8	Correlational	Magazines		SATAQ
Ogden & Mundray (1996)	−.86	10	10		20	Experiment	Magazines	Overweight	Body Dissatisfaction
Park (2005)	−.56			432	20	Correlational	Magazines		Desire for Thinness
Posavac et al. (1998)									
Study 1									
Dissatisfied	−.53	41	41		20	Experiment	Magazines	Object	BES
Satisfied	.23	30	24						
Study 2						Experiment	Magazines	Object	BES
Dissatisfied	−.52	43	42		20				
Satisfied	.51	15	19						

Table 1 (*continued*)

Study	*d*	*N* E	*N* C	*N* S	Mean age (yrs)	Study design	Media type	Type of control	Measure
Study 3					20	Experiment	Magazines	Object	BES
Dissatisfied	−.63	20	20						
Satisfied	1.16	10	3						
Richins (1991)									
Study 3	−.48	37	36		20	Experiment	Magazines	Object	Satisfaction With Attractiveness
Study 4	−.52	42	45		20	Experiment	Magazines	Object	Satisfaction With Attractiveness
Roberson (2001)[a]	−.01	20	20		20.25	Experiment	Magazines	Object	BES
Rocchio (1996)[a]	−.28	41	35		20	Experiment	Magazines	Object	Body Dissatisfaction
Sands & Wardle (2003)	−.56			356	11	Correlational	Magazines		SATAQ
	−.37			356	11	Correlational	Magazines		BES
Schooler et al. (2004)									
	−.21			635	18.8	Correlational	Television		BES
	−.31			635	18.8	Correlational	Television		DT-EDI
	−.15			635	18.8	Correlational	Television		BUL-EDI
Shaw (1995)									
	−.26	24	24		14.5	Experiment	Magazines	Object	Body Satisfaction Scale
	−.04	24	24		27.3	Experiment	Magazines	Object	Body Satisfaction Scale
Stice et al. (1994)	−.00			238	20	Correlational	Media exposure		SATAQ
	−.20			238	20	Correlational	Media exposure		BDS-EDI
	−.52			238	20	Correlational	Media exposure		EAT
Stice & Shaw (1994)	−.13	50	52		19	Experiment	Magazines	Object	BDS-EDI
	−.24	50	52		19	Experiment	Magazines	Object	SATAQ
Stice et al. (2001)	−.25	96	126		15	Experiment	Magazines	Object	Body Dissatisfaction
	.03	96	126		15	Experiment	Magazines	Object	Thin-Ideal Internalization
	−.06	96	126		15	Experiment	Magazines	Object	Bulimic Symptomatology
Strahan (2003)[a]									
Study 1	−.91	13	13		20	Experiment	Television commercials	Object	Restrained Eating
Study 2	−.61	34	34		20	Experiment	Television commercials	Object	Appearance Self-Esteem
Study 3	−.66	17	18		20	Experiment	Television commercials	Object	Restrained Eating
Study 4	−1.36	21	21		20	Experiment	Television commercials	Object	Restrained Eating
Strauss et al. (1994)									
High restraint	.58	13	11		20	Experiment	Television commercials	Object	Food Restraint
Low restraint	−.48	13	16						
Thomsen (2002)	−.45			340	21.3	Correlational	Magazines		Body Shape Questionnaire
Thomsen, McCoy, et al. (2002)	−.37			536	20	Correlational	Magazines		Anorectic Cognitions Scale
Thomsen, Weber, & Brown (2002)	−.25			504	15	Correlational	Magazines		Pathogenic Dieting Behaviors
Thornton & Maurice (1997) Adherence to attractive ideal:									
High	−.23	25	33		20.8	Experiment	Magazines	Object	BDS-EDI
Medium	−.17	25	33		20.8	Experiment	Magazines	Object	BDS-EDI
Low	−.47	26	34		20.8	Experiment	Magazines	Object	BDS-EDI
Tiggemann (2003)	−.39			104	20.7	Correlational	Magazines		FRS
	−.65			104	20.7	Correlational	Magazines		SATAQ
	−.12			104	20.7	Correlational	Magazines		EDI
	−.45			104	20.7	Correlational	Television		FRS
	.08			104	20.7	Correlational	Television		SATAQ
	−.12			104	20.7	Correlational	Television		EDI
Tiggemann (2005)	−.41			799	14.37	Correlational	Magazines		Internalization
	−.24			799	14.37	Correlational	Magazines		BUL-EDI
Tiggemann (2006)									
Time 1	−.59			214	13.98	Correlational	Magazines		Internalization
	−.00			214		Correlational	Magazines		Body Dissatisfaction
	−.29			214		Correlational	Television		Internalization
	.20			214		Correlational	Television		Body Dissatisfaction

Table continues

Table 1 (*continued*)

Study	*d*	*N* E	*N* C	*N* S	Mean age (yrs)	Study design	Media type	Type of control	Measure
Time 2	−.57			214	14.92	Correlational	Magazines		Internalization
	−.26			214		Correlational	Magazines		Body Dissatisfaction
	−.37			214		Correlational	Television		Internalization
	.08			214		Correlational	Television		Body Dissatisfaction
Tiggemann & McGill (2004)	−1.63	14	14		20.6	Experiment	Magazines	Object	VAS
Tiggemann & Pickering (1996)	−.63			94	15.5	Correlational	Thin-ideal TV programming		Body Dissatisfaction
	−.52			94	15.5	Correlational	Music television		DT-EDI
Tiggemann & Slater (2003)	−.42	42	41		20.23	Experiment	Music television	Object	VAS
Turner et al. (1997)									
	−.63	24	25		18.63	Correlational	Magazines	Object	Body Dissatisfaction
	−.49	24	25		18.63	Correlational	Magazines	Object	Dieting
	−.81	24	25		18.63	Correlational	Magazines	Object	Preoccupation With Thinness
Van den Bulck (2000)	−.24			534	17	Correlational	Thin-ideal TV programming		
Wegner et al. (2000)	−1.27	34	33		20	Experiment	Magazines	Average weight	Body Self-Consciousness
Wilcox & Laird (2000)	−.67	21	20		20	Experiment	Magazines	Average weight	BES
Yamamiya et al. (2005)									
High internalizers	−1.47	17	15		32	Experiment	Magazines	Object	BISS
Low internalizers	−.71	16	15		31	Experiment	Magazines	Object	BISS

Note. A positive *d* indicates a positive relationship between media use and women's body image attitudes. E = experimental condition; C = control condition; S = survey study; VAS = Visual Analogue Scale; EAT = Eating Attitudes Test; BDS-EDI = Body Dissatisfaction Subscale of the Eating Disorders Inventory; DT-EDI = Drive for Thinness subscale of the Eating Disorders Inventory; BES = Body Esteem Scale; SATAQ = Sociocultural Attitudes Towards Appearance Scale; PASTAS = Physical Appearance State and Trait Anxiety Scale; BUL-EDI = Bulimia Scale of the Eating Disorders Inventory; DEBQ = Dutch Eating Behavior Questionnaire; BE-BIS = Body Esteem subscale of the Body Image Scale; ASI = Appearance Schemas Inventory; chEAT = Children's Eating Attitudes Test; FRS = Figure Rating Scale; BPSS = Body Parts Satisfaction Scale; BISS = Body Image States Scale.

[a] Dissertation.

Calculation of Effect Sizes

Formulas for the effect size *d* were taken from Hedges and Becker (1986). When means and standard deviations were available, the effect size was computed as the mean body image score for the control condition minus the mean body image score for the experimental condition, divided by the pooled within-groups standard deviation. Therefore, negative effect sizes represent a more negative outcome (e.g., more body dissatisfaction) for women exposed to thin-ideal media than for women in the control condition. Means and standard deviations were available for 74 (93%) of the experimental studies. When means and standard deviations for experimental studies were not available, the effect size was calculated from reported *t* or *F* tests. When *t* or *F* was reported, *d* was calculated using the formula provided by Hedges and Becker (1986). Among the correlational studies (43% of total sample; see Table 2), *d* was calculated from *r* on the basis of formulas provided by Hedges and Becker (1986).

Table 2
Summary of Experimental and Correlational Studies

Measure type	No. studies	Experimental	Correlational
Body image dissatisfaction	90	62	28
Body self-consciousness	8	3	5
Internalization	23	7	16
Eating behaviors	20	8	12
Total	141	80	61

Because effect sizes tend to be upwardly biased when based on small sample sizes, effect sizes were corrected for bias in the estimation of population effect sizes using the formula provided by Hedges (1981). All effect size analyses were weighted analyses (i.e., each effect size was weighted by an inverted variance; Lipsey & Wilson, 2001).

To conduct the meta-analyses, we used mixed-effects models, which assume that effect size variance can be explained by both systematic and random components (Lipsey & Wilson, 2001). In mixed-effects models, certain identifiable study characteristics may act as moderator variables that are associated with systematic differences among effect sizes at the same time that a random component of residual variance remains after the systematic portion is accounted for. The mixed-effects model is preferable in this case because a fixed-effects model assumes that the only source of variation is from systematic factors and the random-effects model assumes none of the variation is from systematic sources. Mixed-effects models assume that the effects of between-study variables are systematic but that there is a remaining unmeasured random effect in the effect size distribution in addition to sampling error. As is done in random-effects models, a random-effects variance component (derived from the residual homogeneity value after the

moderators are taken into account) is estimated and added to the standard error associated with each effect size, and inverted variance weights are calculated.

Moderator Analyses

Because a meta-analysis provides the opportunity to determine whether specific study or sample characteristics influence research findings, we conducted analyses to partition the variance among the effect sizes when homogeneity analyses indicated that total heterogeneity was significant. We considered six potential moderators. In one set of analyses, we examined whether study design (i.e., experimental or correlational) moderated the magnitude of the association between media use and women's body-image-related concerns. Investigating age as a second potential moderator, we divided effect sizes into two groups on the basis of the average age of the participants: (a) 10- to 18-year-olds and (b) those over 19 years old. Type of media was the third potential moderator. Media were grouped in three main categories: (a) magazines, (b) television, or (c) generalized media (e.g., amount of newspaper, magazines, television, movies, and radio consumed by respondent). History of body dissatisfaction (yes/no) was examined as a fourth potential moderator. Because publication bias is a concern in any meta-analysis, we examined publication status as a fifth moderator. To investigate publication year, we divided effect sizes into two groups: studies published between 1990 and 2000 and those published between 2001 and 2007. One study published outside these categories (i.e., 1983) was excluded from the moderator analyses. Finally, although we conceptualize ethnic background as an important variable that may influence the effects of media on body image, only two studies in this review examined the hypothesized relations among subgroups of women (see Borzekowksi, Robinson, & Killen, 2000, for separate effects among Asian, Black, Latina, and White girls; see Schooler, Ward, Merriwether, & Caruthers, 2004, for an African American and White comparison). Two additional studies examined the hypothesized relations among only groups of ethnic minority women (see Becker, Burwell, Gilman, Herzog, & Hamburg, 2002, for a Fijian sample; Frisby, 2004, for an African American sample). Thus, there was not a sufficient number of studies that included ethnic minority women to examine differences among subgroups of women.

Results

Mean Effect Sizes

Mean effect sizes were calculated for each category of outcomes. The results are reported in Table 3 and are discussed below. The number of samples (k), the weighted d (weighted by w: Hedges & Vevea, 1998; Lipsey & Wilson, 2001), the 95% confidence interval (CI) for d, and the total homogeneity statistic (Q_T) for each comparison are reported. The majority of effect sizes were negative (85%).

Body Dissatisfaction

Mean effect size. As can be seen in Table 3, the weighted mean effect size, averaged over 90 independent effect sizes, for the relation between media exposure and body dissatisfaction was −0.28, representing a small to moderate effect by Cohen's (1988) criteria. The negative value indicates that, overall, media exposure is associated with decreased levels of body satisfaction for women. Homogeneity analyses using procedures specified by Hedges and Becker (1986) and Lipsey and Wilson (2001) indicated that the set of 90 effect sizes was homogenous, $Q_T = 100.34$, compared with a critical value of $\chi^2(89, N = 90) = 112.02$, $p < .05$. Because significant heterogeneity was not present, moderator analyses were not warranted.

Table 3
Summary of Mean Effect Sizes for Mixed-Effects Analyses

Measure type	No. studies	d	95% CI	Q_T
Body image dissatisfaction	90	−.28	−.21 to −.35	100.34
Internalization	23	−.39	−.33 to −.44	66.15*
Eating behaviors and beliefs	20	−.30	−.24 to −.36	46.30***

Note. A negative d indicates that the control group scored higher than the experimental group on negative body image. CI = confidence intervals; Q_T = Total heterogeneity.
* $p < .05$. *** $p < .001$.

Internalization

Mean effect size. As can be seen in Table 3, the weighted mean effect size for the relation between media exposure and women's internalization of the thin ideal, averaged over 23 independent effect sizes, was −0.39 (95% CI was −0.33 to −0.44), representing a small to moderate effect by Cohen's (1988) criteria. Homogeneity analyses indicated that the set of 23 effect sizes was significantly heterogeneous: $Q_T = 66.15$, the critical value of $\chi^2(22, N = 23) = 48.27$, $p < .001$.

Moderator analyses. Because the set of effect sizes was heterogeneous, moderator analyses were warranted. Results of moderator analyses are shown in Table 4. Because no studies included participants with a prior history of body dissatisfaction and no dissertations assessed internalization as an outcome, moderator analyses were not run for these variables. Significant between-groups heterogeneity appeared for study design and publication year such that larger effects were found in the correlational literature than in the experimental literature $\chi^2(1, N = 2) = 6.64$, $p < .01$, and for studies published in the 2000s compared with those in the 1990s, $\chi^2(1, N = 2) = 10.83$, $p < .001$. This finding suggests that either the effects of media exposure on women's internalization of the thin ideal have grown stronger in the 2000s relative to the 1990s or that study designs have become more sensitive to assessing potential associations. However, because the number of studies in these comparisons is few, interpretations of these moderated relations should be made with caution. Furthermore, although the presence of multiple moderators often warrants multiple regression analyses to determine the relative influence of moderator variables on effect size magnitudes (Hedges & Becker, 1986), in our judgment there were too few studies in each group to justify multiple regression analyses in this case.

Eating Behaviors and Beliefs

Mean effect size. As reported in Table 3, averaged over 20 independent effect sizes, the weighted mean effect size for the

Table 4
Variables Potentially Moderating the Link Between Media Exposure and Internalization

Variable	Between-groups Q	No. studies	d	Within-group Q
Study design	7.10**			
Experimental		7	−.21	25.83***
Correlational		16	−.42	33.22***
Age group in years	3.78			
Adolescent (10–18)		13	−.42	26.18*
Young adult/adult (19–32)		10	−.31	36.19
Media type	5.10			
Television		7	−.39	5.09
Magazines		14	−.37	45.07
Generalized media		2	−.33	10.89***
Publication year	12.85***			
1990–1999		4	−.13	3.75
2000–2005		19	−.42	45.55***

Note. Q = heterogeneity.
* $p < .05$. ** $p < .01$. *** $p < .001$.

relation between media exposure and women's eating behaviors and beliefs was −0.30 (95% CI was −0.24 to −0.36), representing a small to moderate effect by Cohen's (1988) criteria. The negative value indicates that, overall, media use is related to higher eating disorder symptomatology. Homogeneity analyses indicated that the set of 20 effect sizes was heterogeneous ($Q_T = 46.30$) compared with a critical value of $\chi^2(19, N = 20) = 43.82$, $p < .001$.

Moderator analyses. The results of the moderator analyses for eating behaviors and beliefs are shown in Table 5. Because only one study included participants without a prior history of body dissatisfaction, moderator analyses were not run for prior history. The significant between-groups homogeneity statistics for age, $\chi^2(1, N = 2) = 3.84$, $p < .05$; media type, $\chi^2(1, N = 2) = 3.84$, $p < .05$; and publication status, $\chi^2(1, N = 2) = 10.83$, $p < .001$, suggest that there is a significant difference in the magnitude of effect sizes as a function of these moderator variables. These findings suggest that the relation between media exposure and eating behaviors and beliefs is slightly stronger for adults than for adolescents, for generalized media use as opposed to television or magazine use, and much stronger for published versus unpublished manuscripts. Again, however, in each comparison the number of studies was few, precluding the use of multiple regression analyses and lending caution to interpretation of these findings.

Discussion

This meta-analysis represents a systematic inquiry into the overall associations of thin-ideal media exposure and three main areas of women's body image and related concerns. The results show consistent associations across both experimental and correlational designs and across multiple measures of women's body image and eating behaviors and beliefs. Thus, these findings provide strong support for the notion that exposure to mass media depicting the thin-ideal body is related to women's vulnerability to disturbances related to body image.

Body Dissatisfaction

Consistent with the findings of Groesz et al. (2002), which were based on experimental studies, we found a small to moderate effect size suggesting that exposure to media images that depict the thin-ideal body is indeed linked to women's dissatisfaction with their own bodies. We replicated this finding with double the number of effect sizes, providing even greater support for the small to moderate negative relation between media exposure and women's body satisfaction. The finding from the experimental literature in the current review (57% of studies) provides evidence of a link between exposure to thin-ideal media images and body dissatisfaction in women. The similar outcome found in the correlational literature supports this finding and suggests that this phenomenon also operates outside a laboratory context. Prospective studies will be important in fully assessing the role of the media in women's vulnerability to disturbances related to body image.

Internalization and Eating Behaviors and Beliefs

In addition to clarifying the inconsistent findings demonstrated in the prior two meta-analytic reviews that focused on women's body dissatisfaction, the current review provides new information regarding the link between media and additional dimensions concerning women's experience of their bodies. Importantly, we found that media exposure was related to multiple outcome measures. Specifically, and consistent with our expectations, we found relationships between media and internalization of the thin ideal as well as between media and women's eating behaviors and beliefs. The small to moderate effect sizes found for these outcomes were comparable to the effect sizes for media exposure on body dissatisfaction. These findings suggest that, overall, thin-ideal media exposure is related to higher levels of body dissatisfaction, stronger internalization of the thin ideal, and more frequent bulimic and anorexic attitudes and behaviors. Interestingly, for the internalization outcome variable, we found that effects were stronger in the 2000s compared with in the 1990s. This finding should be interpreted cautiously because publication year may not accurately reflect the year that data were collected. However, this finding

Table 5
Variables Potentially Moderating the Link Between Media Exposure and Eating Behaviors and Beliefs

Variable	Between-groups Q	No. studies	d	Within-group Q
Study design	0.84			
Experimental		8	−.36	21.91**
Correlational		12	−.28	28.46**
Age group in years	6.43*			
Adolescent (ages 10–18)		4	−.20	4.38
Young adult/Adult (ages 19–32)		16	−.35	40.40***
Media type	4.0*			
Television		7	−.29	22.42**
Magazines		11	−.26	24.70**
Generalized media		2	−.50	.09
Publication status	11.42***			
Published		17	−.27	37.72**
Not published		3	−.99	2.07
Publication year	0.09			
1990–1999		8	−.30	25.81***
2000–2005		12	−.28	25.31**

Note. Q = heterogeneity.
* $p < .05$. ** $p < .01$. *** $p < .001$.

allows us to speculate that the increasingly more prevalent objectifying images of women in the media may lead to increased internalization of the publicized ideal (see American Psychological Association, 2007, for a review). Furthermore, there was evidence that the magnitude of the effect size between media exposure and internalization was larger in the correlational literature, perhaps reflecting the fact that internalization of the thin ideal develops over time and with massive exposure, making it difficult to capture in a one-time laboratory setting. In sum, there does appear to be evidence that media exposure and women's internalization of the thin ideal are linked.

The effect sizes for the relation between media exposure and eating behaviors and beliefs were also consistent with the hypothesis that women exposed to thin-ideal media would score higher on measures that assess bulimia, purging, and anorexic attitudes and behaviors. Obviously, during a brief experiment we would not expect changes in behavior; however, many items on these measures concern beliefs about eating, purging, and dieting. In the context of an experiment, these direct effects are of particular concern because they suggest that even a brief manipulation can directly affect women's beliefs about dieting and eating and can encourage acceptance of behaviors that are potentially harmful to women's health, including purging and severe caloric restriction (Hawkins, Richards, Granley, & Stein, 2004). Furthermore, although there was statistical evidence that the effect sizes for eating behaviors were moderated, all of the effect sizes were in the same direction and in the small to moderate range. A finding linking media exposure to disordered eating behaviors and beliefs should warrant public attention. Eating disorders are among the 10 leading sources of disability among young women, and anorexia nervosa has the highest mortality rate of all mental disorders (Striegel-Moore & Bulik, 2007).

Concerns about eating disorders—specifically, anorexia and bulimia—must be balanced against concerns about the epidemic of obesity in the American population, including the population of American women. Obesity, of course, carries its own set of health risks as well.

Finally, the findings related to women's self-consciousness surrounding their bodies were too preliminary to be conclusive. The few studies eligible for this review highlight that much more research is warranted to understand the media's role in the development of body self-consciousness.

Conclusion

Taken together, the findings from these analyses suggest that media exposure is linked to women's generalized dissatisfaction with their bodies, increased investment in appearance, and increased endorsement of disordered eating behaviors. These effects appear robust: They are present across multiple outcomes and are demonstrated in both the experimental and correlational literatures. Thus we can see that media exposure appears to be related to women's body image negatively regardless of assessment technique, individual difference variables, media type, age, or other idiosyncratic study characteristics. Moreover, although 43% of the effect sizes in our analyses were from correlational studies, thereby precluding causal inferences, 57% were from experimental designs. Indeed, because no single methodological approach can stand alone in answering these key questions, we believe that converging results from studies using multiple methodologies enhance confidence in the validity of the conclusions drawn. However, what remains necessary is the use of longitudinal, prospective designs; longitudinal studies are positioned to provide additional evidence regarding the role of media in disturbances related to body image.

Other Research on Media Effects

The current findings can be interpreted in the context of other, more well established areas of media research. For example, researchers have focused extensively on the influence of violent media on the aggressive behavior of youth. Findings from a meta-analysis summarizing the most up-to-date literature demonstrated that both experimental and correlational studies, on average, yielded an effect of violent video games on aggressive behavior that was comparable to the effects reported in the current study (average effect size $r = .28$; C. A. Anderson et al., 2004). The authors reported that the experimental studies demonstrated that brief exposure to violent video games led to an immediate increase in aggressive behavior, whereas the correlational studies linked repeated exposure to violent video games to a variety of types of real-world aggressive behavior, including violent criminal behavior. Of course, media violence research is a much more mature area of scholarship with a longer history of research and increasingly sophisticated designs that make these inferences warranted. Thin-ideal media research is much newer and inferences must therefore be more modest, but the media violence research provides a roadmap for ways in which research can proceed.

Implications

The findings from this study can inform prevention and intervention efforts particularly in the areas of education and advertising. With respect to education, media literacy can be used to teach girls and women to become more active, critical consumers of appearance-related media to prevent the development of body dissatisfaction and disturbed eating behaviors. For example, Posavac et al. (1998) 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 had seen the same images without prior education. In another study, Irving, Dupen, and Berel (1998) found that female high school students who participated in a media literacy discussion reported lower perceived realism of media images and less internalization of the popular standard of beauty. However, Irving et al. also reported that the groups did not differ on levels of body dissatisfaction. In fact, despite the critical awareness that media literacy training stands to offer, several studies have found limited evidence of the effectiveness of media literacy, suggesting that the pervasiveness of the media's promotion of the thin ideal is far greater than the proactive messages offered in one-time interventions (e.g., Irving & Berel, 2001; McVey & Davis, 2002). Thus, short-term media literacy interventions alone may not suffice to counteract massive media exposure to the thin ideal.

Perhaps of greater benefit would be to reduce the emphasis on an unrealistically thin ideal that is perpetuated through the objec-

tification of women's bodies in the media. Interestingly, Dittmar and Howard (2004) found that women reported less body-focused anxiety after exposure to attractive, average-size models than after exposure to no models; the lowered anxiety, in a sense, demonstrates a relief effect due to exposure to "average" models. Importantly for the advertising industry, research in this area has also demonstrated that when average-size models and ultra-thin models are equally attractive, they are also perceived to be equally effective in advertising a product (Dittmar & Howard, 2004; Halliwell & Dittmar, 2004; Halliwell, Dittmar, & Howe, 2005). These findings suggest that use of average-size models in advertising could help protect some women from developing body dissatisfaction or at least avoid exacerbating existing body image concerns.

Limitations and Future Directions

Despite the contributions of the present study, there are limitations that future research may want to address. First, much of what is known about women's body dissatisfaction is based largely on White samples (Grabe & Hyde, 2006), with a significant omission of women of color from this research area. It is therefore unclear from our results whether media exposure would operate similarly across other ethnic groups. The limited number of studies in this review that did examine the role of ethnicity suggested that it does affect women's level of body dissatisfaction in the face of mainstream media (e.g., Schooler et al., 2004). Therefore, this review highlights the extreme neglect of women of color in this research area. Further study of media exposure among girls and women from diverse ethnic groups, and with ethnic-focused media, is needed to increase our knowledge of the role that the media play in body image disturbance in girls and women of color. Furthermore, the findings of this review are not generalizable beyond English-speaking countries.

Second, although we believe that the correlational data enhanced the validity of the experimental findings by providing data on actual media diets, the nature of correlational data do not permit identification of the prospective contributions of media to the development of negative body image. Although there were not enough prospective studies to include in the meta-analytic paradigm, recent longitudinal investigation has begun to demonstrate that exposure to appearance-focused media prospectively contributes to the development of body image issues among girls and women. Specifically, it has been found that viewing sexually objectifying television predicts subsequent self-objectification one year later among college women (Aubrey, 2006). Other findings indicate that increased television viewing among grade school girls is associated with higher disordered eating one year later (Harrison & Hefner, 2006); that frequent viewing of appearance-focused television among girls predicts lower levels of appearance satisfaction one year later (Dohnt & Tiggemann, 2006b); and that frequent magazine and television exposure among teenage girls each predict higher levels of internalization, core beliefs about appearance value, and drive for thinness one year later (Tiggemann, 2006). Although more longitudinal research designs are ultimately needed to test the long-term effects of media exposure, the initial findings, coupled with the meta-analytic results, strongly suggest that the media are influential in the development of body image issues among women.

Third, research on the potential consequences of thin-ideal media need to be extended to include other outcomes, such as obesity and body self-consciousness. The findings we analyzed related to women's self-consciousness surrounding their bodies were too preliminary to be conclusive. However, the few studies eligible for this review highlight that much more research is warranted to understand the media's role in the development of body self-consciousness. In addition, given the roles of body dissatisfaction and dieting behavior in the onset of obesity (e.g., Field & Colditz, 2001; Haines & Neumark-Sztianer, 2006), research in this area should also begin to include obesity and other weight-related behaviors as outcomes, both directly and indirectly. At the moment, media use is assumed to connect to obesity via exposure to repeated advertisements of unhealthy foods and via the inactivity that comes with viewing (e.g., Haines & Neumark-Sztianer, 2006). But it is also likely that media exposure, which means exposure to the thin ideal, contributes to obesity through its promotion of body dissatisfaction, bingeing behaviors, and unhealthy attitudes and practices, such as meal skipping. Evidence that dieting is a significant predictor of obesity, which characterizes 30% of American women (Centers for Disease Control, 2006), continues to build. For example, data from the prospective longitudinal sample of Neumark-Sztianer and colleagues (Neumark-Sztianer et al., 2006; Neumark-Sztianer, Wall, Haines, Story, & Eisenberg, 2007) indicate that adolescents who reported dieting were at nearly twice the risk for being overweight 5 years later and that those who used unhealthful weight control behaviors, such as meal skipping and diet pills, were at 3 times the risk. More extensive study of the role of thin-ideal media exposure in these important health behaviors is needed.

Finally, it is interesting to note that in a small percentage of studies there was a positive effect of media on women's body image concerns, suggesting that some women actually feel better about themselves after viewing media images. However, this effect was found in only 8 of 141 samples. Interestingly, in half of those, the positive effect was demonstrated among either restrained eaters or body-satisfied women (e.g., Joshi, Herman, & Polivy, 2004; Mills, Polivy, Herman, & Tiggemann, 2002). Thus, it is possible that women who are consciously addressing their body image (e.g., restricting calories) or are already satisfied with their bodies feel elevated satisfaction in the presence of the appearance-related cues provided by the media. However, given that the number of studies in this area were few, interpretations of this finding are tentative.

It would also be important to examine potential defenses against the negative correlates of media use. Several studies have demonstrated that the extent to which women internalize cultural ideals of thinness and appearance as a personal standard operates as a moderator of their vulnerability to the negative impact of thin-ideal media images on their own body image (Dittmar & Howard, 2004). Thus, minimizing the importance of attractiveness seems to be an important avenue for inoculating women against thin-ideal media images. However, given the prevalence of the mass media it seems unrealistic to expect that the majority of girls and women can be sufficiently defended against a vast array of messages that reinforce the notion that attractiveness should be of primary importance to women. New policies adopted in Spain and Italy, and more tentatively by the Council of Fashion Designers of America, that exclude hyperthin women from modeling may be helpful not only to the models themselves but also to millions of girls and women who view these images.

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