



Preventing the development of body issues in adolescent girls through intervention with their mothers

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ABSTRACT

The purpose of this study was to test the efficacy of the *Healthy Girls Project*, an ecologically based, targeted prevention program aimed at discouraging the development of body-related problems in middle-school girls via an intervention directly and only with their mothers. Participants were 31 seventh- and eighth-grade girls and their mothers. The empirically based intervention comprised a series of 4 weekly workshops that had both interactive psychoeducational components and behavioral components (e.g., homework to do with daughters, modeling activities). The study design was experimental, with mother–daughter dyads randomly assigned to either the intervention group or a wait-list control group. Daughters completed pretest (i.e., pre-workshop) measures, posttest measures, and, 3 months later, follow-up measures. Results indicated that at both posttest and follow-up, girls whose mothers were in the intervention group perceived less pressure from their mothers to be thin. At follow-up, these girls also showed a lower drive for thinness. Results were mixed regarding group differences in body dissatisfaction levels at posttest and at follow-up. Results are discussed in terms of their implications for targeted prevention efforts aimed at girls during their middle-school years.

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Introduction

Despite widespread agreement that mothers play a substantial role in the development of their daughters' body image, no published intervention programs focus primarily and specifically on mothers. This gap is both surprising and significant given that: (a) the potentially deleterious impact of parents on girls' body image and weight management is well-established (e.g., Cooley, Toray, Wang, & Valdez, 2008; Snoek, van Strien, Janssens, & Engels, 2009; Wertheim, Mee, & Paxton, 1999); (b) body dissatisfaction and unhealthy weight management during the adolescent years are significant public health concerns (e.g., Neumark-Sztainer, Wall, Haines, Story, Sherwood, & van den Berg, 2007); and (c) the need for specific, parent-based interventions for adolescent body dissatisfaction and related variables has been acknowledged (e.g., Levine & Smolak, 2009; Neumark-Sztainer, Levine, Paxton, Smolak, Piran, & Wertheim, 2006).

Mothers serve as primary models of body regard and eating practices for their daughters (e.g., Cooley et al., 2008; Snoek et al., 2009; Wertheim et al., 1999). A mother's investment, for example,

in her own slenderness is related to her middle-school age daughter's engagement in dieting (Levine, Smolak, Moodey, Shuman, & Hessen, 1994). Furthermore, there is a strong correspondence ($r = .68$) between a girl's restrained eating behavior and that of her mother's at as early as age 10 (Hill, Weaver, & Blundell, 1990). Such mother–daughter dieting correspondence appears especially likely when extreme restriction is considered. Wertheim et al., for instance, found substantial correspondence between mother and daughter reports of their extreme weight loss behaviors, such as fasting and skipping meals. Other research indicates that daughters' mere perceptions of their mothers' dieting behaviors correspond to their own weight-related attitudes and behaviors. For example, daughters' perceptions of their mothers' dieting behaviors were related to their own weight concerns and fasting and purging behaviors in girls Grades 7 through 12 (Keery, Eisenberg, Boutelle, Neumark-Sztainer, & Story, 2006). In fact, simply hearing a mother talk about her body and weight concerns is detrimental. For instance, child reports of parental comments about a parent's own weight have been associated with greater dieting and higher body dissatisfaction in fourth- through sixth-graders (Haines, Neumark-Sztainer, Hannan, & Robinson-O'Brien, 2008). Similarly, in girls in Grades 4 and 5, mothers' complaints about their own weight and weight loss attempts were positively associated with daughters' weight loss behaviors and negatively associated with daughters' body esteem (Smolak, Levine, & Schermer, 1999). Perhaps most compelling is

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that even relatively subtle parental comments about a daughter's weight are related to problematic behaviors. Mothers' mere mention of their daughters' weight, for example, is related to daughters' greater engagement in weight loss behaviors as well as lower body esteem as early as Grades 4 and 5 (Smolak et al., 1999).

These and other studies, as well as prior integrations by noted researchers (e.g., Levine & Smolak, 2009; Neumark-Sztainer et al., 2006; Smolak, 2009), illuminate the influence mothers can have on their daughters' body-related attitudes and behaviors and point to a number of implications for parent intervention. To our knowledge, however, no published research has presented a specific, targeted, parent intervention aimed at affecting body dissatisfaction in adolescent girls. In fact, Levine and Smolak's recent review of prevention programs (2009) indicates that currently there are no prevention programs of the targeted type for middle-school girls.

We are aware of only one intervention program that was delivered to parents of adolescent girls which was intended to reduce body dissatisfaction and associated variables (e.g., thin-ideal internalization, dieting, and bulimic behaviors) among girls at risk (Trost, 2006). In this unpublished dissertation, 81 parents (all but one were mothers), who had reported during brief, pre-treatment screening that their daughters had body-image concerns, were randomly assigned either to a workshop intervention group or a waitlist control group. At both posttest and follow-up testing, no differences were observed, unfortunately, across daughters whose mothers had been assigned to the intervention versus those whose had been assigned to the control group.

In response to the need for tested, ecologically based, intervention efforts aimed at implementing what is known about maternal influence on girls' body image issues, we developed a four-part intervention program aimed at mothers of adolescent girls. In doing so, we drew heavily from Neumark-Sztainer's guidelines for parents (2005), which are based, in turn, on highly influential programs of research spanning two decades (for discussion, see Neumark-Sztainer et al., 2006). We also relied on recent conceptual papers and reviews that describe the state of the art as well as remaining needs in the intervention field (e.g., Levine & Smolak, 2009; Smolak, 2009). Finally, we incorporated the resultant process recommendations offered by Trost (2006).

The purpose of this study was to experimentally test the efficacy of an ecologically based intervention program aimed at modifying eating and weight-related attitudes and behaviors in middle-school girls—before they reach high school and their body-related attitudes and identities solidify. We presented to the mothers of seventh- and eighth-grade girls a four-part intervention workshop aimed at helping mothers understand and recognize the pervasiveness and insidiousness of the thin-ideal so they might work to mitigate its effects via their relationships with their daughters. We evaluated its effects on daughters both immediately and 3 months later.

We tested three hypotheses, each of which was a comparison of girls whose mothers underwent the intervention program and girls whose mothers did not. First, we hypothesized that girls whose mothers underwent the intervention program would feel less pressure from their mothers to be thin. This was hypothesized because the workshop materials are aimed at educating mothers about the pervasive, insidious nature of the thin ideal standard as well as mothers' roles in mediating their own and their daughters' relationships with messages from the media and from persons who perpetuate media messages. Second, we hypothesized that the program would dampen the normative rise in body dissatisfaction observed in girls in this age group. Third, we hypothesized that the program would diminish girls' drive for thinness.

Method

Participants

Participants were 31 middle-school girls and their mothers. Girls were in seventh (81%) or eighth (19%) grade, and ranged in age from 12 to 14 ($M = 13.16$, $SD = 0.45$). Mothers ranged in age from 33 to 58 ($M = 43.74$, $SD = 6.13$), and had an average of approximately three children. Most of the girls were European American (77%), but one identified as Asian American, one identified as African American, and five did not select a major race category and instead chose "other." Most of the mothers were European American (83%), with a few identifying as Latina ($n = 1$) or "other" ($n = 4$). Most worked outside the home either full-time (42%) or part-time (32%); only 26% did not. The average household income was \$88,350 (range = \$20,000–\$175,000).

Design and procedure

This study employed a between-subjects experimental design. The general procedures of this study (approved by our institutional review board) entailed, first, a screening/pretest session for girls and their mothers, then random assignment of mothers to either the workshop intervention condition or the control group, then a posttest session 1 week following the conclusion of the workshops, and finally a follow-up testing session 3 months later.

We sent solicitation letters to parents of all seventh- and eighth-grade girls in three public middle schools. The letters, sent by researchers from "The Healthy Girls Project," explained that we were inviting participation in a multi-part study aimed at promoting healthy body perspectives in adolescent girls. A member of our team then returned the calls of mothers who had phoned the Healthy Girls Project to express interest in the study ($N = 55$). The team member provided more information about the study and answered any questions. Some mothers indicated that they believed their or their daughter's schedules likely would preclude their ability to commit to participation and a small number did not return our phone calls. One month later, we re-contacted interested mothers to schedule a combined screening/pretest session for mothers and daughters; 46 dyads expressed a commitment to participating and their screening/pretest appointments were scheduled. (Due to constrained resources, the screening and pretesting processes were combined into one session. If, following this session, screening data indicated that a daughter did not meet study criteria, the mother was contacted and informed.)

Mother–daughter dyads completed the screening/pretest session at a conveniently located research clinic. Dyads were greeted by a female experimenter who provided an overview of the session procedures. The experimenter explained that mother and daughter would be working separately in private rooms and that each could see the other at any time. Each was then escorted to a private testing room. Each mother read and signed an informed consent form and completed a demographic questionnaire. Each daughter read and signed an assent form and was then escorted to a private room in which the experimenter measured the daughter's height and weight. (Later, outside of the girl's presence, each girl's Body Mass Index [BMI] was calculated.) The experimenter then escorted the daughter back to the private testing room where she completed a questionnaire packet. The experimenter invited the daughter to indicate any questions via adhesive notes, and informed her she periodically would return to respond to any questions.

Following completion of the demographic questionnaire, each mother completed a diagnostic interview (described below) about her daughter to screen for girls with eating disorders. At the

conclusion of the session, the experimenter provided the mother with a packet containing copies of the consent and assent forms, monetary payment (\$10.00 each for mother and daughter), and a list of counseling referral sources. Once the daughter had finished, the experimenter reunited mother and daughter in the waiting room, provided an overview of the remaining study timeline, and invited mother and daughter to ask any remaining questions. We followed these same testing procedures at the posttest and follow-up sessions, except that the diagnostic interview and BMI assessments were not again conducted.

At the conclusion of the screening/pretest phase, we evaluated each girl's data to assess her eligibility for study inclusion. We set our criteria to exclude any girl who: (a) met diagnostic criteria for an eating disorder (because the intervention would not provide her the assistance she would require) or (b) reported no body dissatisfaction. We used results from the diagnostic interview as well as responses to items on two body dissatisfaction scales to assess eligibility. This resulted in the exclusion of 14 dyads, reducing the potential sample size to 32 dyads.

Following the screening phase, mother–daughter dyads were randomly assigned via a random number generator either to the intervention condition or the control condition. Of the 32 dyads, one ultimately declined participation because of scheduling concerns, resulting in a final sample size of 31 dyads. Mothers in the intervention condition completed a series of workshops (described below); mothers in the control condition comprised a waitlist control group.

Toward the end of the workshop series, we contacted all mothers to schedule posttest sessions to begin exactly 1 week after the conclusion of the workshop. In conducting the posttest sessions, we used the same testing procedures and materials as at pretest (described above), except that instead of completing demographic items and a diagnostic interview, each mother responded to an item querying as to whether, during the course of their enrollment in this study, she or her daughter had participated in any other type of treatment, training, counseling, or program outside the study to address issues of body image or eating. Mothers and daughters were paid \$20.00 each for their participation in the posttest session.

Ten weeks later, we contacted all mothers to schedule a follow-up session to take place 3 months after the date of the posttest. The procedures and materials were identical to those used at posttest. At the conclusion of the follow-up session, mothers and daughters were paid \$30.00 each for their participation in the session, and mothers in the control condition were informed that they would be contacted with information about participation in the workshop series.

Measures

Body mass index (BMI)

BMI scores, which provide an indicator of body fat and, as such, an indication of healthiness, were calculated for each girl. Each girl's BMI was calculated by a staff member using the Child BMI Calculator provided by the Mayo Clinic's website (<http://www.mayoclinic.com>), which takes into account the child's sex and birthdate.

Diagnostic interview

Screening evaluations of eating disorder symptomatology were conducted using the Computerized Diagnostic Interview Schedule for Children (C-DISC; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The C-DISC is a widely used tool that uses *DSM-IV* criteria to arrive at diagnoses for 36 mental health disorders. It was developed for use in both clinical and community populations, and can be pre-set to assess for only selected diagnoses. In the present study, the C-DISC was pre-set to assess only for eating disorders

(i.e., anorexia nervosa and bulimia nervosa). The C-DISC can be administered either directly to the child or to a caretaker in regard to the child. In this study, mothers were asked to report on their daughters' symptoms. The experimenter positioned herself with a laptop computer across from the mother who, following C-DISC protocol, was read interview questions as they appeared on the screen. The experimenter entered the mother's responses as they were provided. Following the interview, the program generates a report for each examinee indicating diagnostic status as *positive* (i.e., having met full criteria for an eating disorder), *intermediate* (i.e., full criteria not met but some symptoms present), or *negative* (i.e., minimal or no symptoms present).

Maternal pressure to be thin

The 9-item Maternal Pressure Scale was used to assess the amount of pressure to be thin that girls perceived from their mothers. This measure was adapted from Trost's (2006) measure which assesses parents' perceptions of the pressure they put on their daughters to be thin. We revised only the stem of each item so that each asks the daughter to reflect on pressure she perceives from her mother. Example items include, "My mom encourages me to watch my weight" and "My mom sends a strong message that I should have a thin body." Respondents indicate the extent of their agreement with each statement using a scale ranging from 1 (*agree*) to 4 (*disagree*). In the present study, Cronbach's alpha was estimated at .83, .78, and .86, successively across the three data collection sessions.

Body dissatisfaction

Two measures were used to assess body dissatisfaction. The 9-item Body Dissatisfaction subscale of the Eating Disorders Inventory (EDI; Garner, Olmsted, & Polivy, 1983) was used to assess the frequency with which the respondent is dissatisfied with her overall body shape as well as the shape and size of some specific body parts. An example item is, "I think that my hips are too large." Respondents indicate the frequency of their endorsement of each statement using a 6-point scale ranging from 0 (*never*) to 5 (*always*), with high scores indicating greater frequency of body dissatisfaction. Evidence of the concurrent validity of the subscale among older adolescents derives from its strong correlations in the expected direction with, for example, the Drive for Thinness subscale of the EDI ($r_s = .63-.67$; see Espelage et al., 2003; Shroff & Thompson, 2006). In the present study, Cronbach's alpha was estimated at .87, .89, and .89, successively across the three data collection sessions.

A second measure, the Body Parts Dissatisfaction Scale (BPDS), was constructed to assess bodily discontent in a manner that we believed might be more sensitive to middle-school girls' experiences of their bodies. In particular, we sought use of a measure that lists body parts in concrete terms but does not prompt responses along a *satisfaction–dissatisfaction* continuum, as is common among measures of this type. We reasoned that girls of this age may not see themselves (yet) as part of the body dissatisfied norm and we hoped to avoid invoking response bias toward endorsing dissatisfaction (if, perhaps, it might seem more womanly or "grown-up" to convey such dissatisfaction). Instead, the BPDS was constructed such that it lists parts and asks whether there is a desire to change any part. The respondent first is asked, "Is there anything you would like to change about your body?" Then, below this prompt are listed seven parts and an "other" option, and next to each part are columns labeled "smaller" and "bigger." The respondent is instructed to place a checkmark next to any and all body parts (i.e., hips, buttocks, chest, legs, thighs, stomach, waist, and other) she would like to change, and then to indicate via a checkmark whether she wishes the part were smaller or bigger. Any item not checked indicates that the participant does not wish

for it to be smaller or bigger, presumably conveying that the girl is content with that body part. In this way, the BPDs comprises three subscales (parts wished were smaller, parts wished were bigger, and parts with which content).

In terms of scoring, the first step is to examine any responses provided under “other” to determine whether they are equivalent or not equivalent to a body part provided in the list. In the present study, if a response to “other” was equivalent to a body part in the list, we re-categorized it as such. For example, if a girl wrote “tummy” in response to “other,” it was re-categorized as a response to the body part, stomach. If the body part written in response to “other” was not consistent with any listed part, it was not re-categorized. For example, if a girl’s response was “forehead” or “eyelashes,” this response was maintained in the “other” category. These few responses in the “other” category (less than .08% of the responses to “other”) were then discussed by the researchers. In each case, these remaining responses were considered miscellaneous and not further analyzed.

For each subscale, a frequency score can be calculated by summing the number of parts that respondents wished were smaller, bigger, or not endorsed. For example, a girl who chose “smaller” for each body part would have a score of seven for “number of parts wished were smaller” and scores of zero for “number of parts wished were bigger” and “number of parts with which content.” A girl who did not check any parts would have scores of zero for “number of parts wished were smaller” and “number of parts wished were bigger” and a score of seven for “number of parts with which content.”

Data from the present study (i.e., the full sample at pretest, prior to random assignment) yield preliminary evidence of the scale’s validity. The number of parts girls wished were smaller was positively correlated with girls’ EDI Body Dissatisfaction scores ($r = .68, p = .0001$) and with their EDI Drive for Thinness scores ($r = .49, p = .006$). Similarly, the number of parts with which girls were content was inversely correlated with their EDI Body Dissatisfaction scores ($r = -.66, p < .0001$) as well as their EDI Drive for Thinness scores ($r = -.46, p = .009$).

Drive for thinness

The 7-item Drive for Thinness subscale of the EDI (Garner et al., 1983) was used to assess “excessive concern with dieting, preoccupation with weight, and entrenchment in an extreme pursuit of thinness” (p. 17). An example item is, “I am preoccupied with the desire to be thinner.” Respondents indicate the frequency of their endorsement of each statement using a 6-point scale ranging from 0 (*never*) to 5 (*always*), with higher scores indicating a greater drive for thinness. Evidence of the construct validity of the subscale among older adolescents is available from Espelage et al. (2003) and Shroff and Thompson (2006). In the present study, Cronbach’s alpha was estimated at .84, .90, and .86, successively across the three data collection sessions.

Workshop intervention

Mothers in the intervention condition participated in a series of four weekly, 90-minute workshops held in a comfortable university laboratory. Mothers participated in these workshops in small groups of about four, and each group was facilitated by a female psychologist or advanced psychology doctoral student with intervention experience. The workshop sessions had a similar format each week which combined elements of psychoeducation, behavioral activities (e.g., thought exercises, group brainstorming and problem-solving, role-playing), and discussion. Fidelity checks were conducted regularly to assure that workshop materials were adhered to by each facilitator as written.

Each session opened with a brief period of relationship-building and an overview of the session. During each session, facilitators

provided an orientation to and description of that week’s homework exercises, and invited mothers to ask questions before leaving. Between sessions, facilitators contacted mothers via email or phone to encourage adherence to the homework.

The workshop series was modeled on the program developed by Trost (2006), with three primary changes. First, a fourth 90-minute workshop session was added to give mothers ample opportunity “to reflect on intervention material between repeated sessions” and “to try new skills and then return to the group for troubleshooting advice,” as recommended by Stice and Shaw (2004, p. 207). In addition, by including an additional session, we were able to allocate more time at the start of Sessions 2, 3, and 4 to processing mothers’ experiences with the previous week’s homework.

Second, we restructured the in-session activities to flow more seamlessly into and to enrich the homework exercises. To this end, we shortened the verbal introductions to several of the in-session activities and lengthened the time devoted to focused discussion after each of these (thereby shifting the emphasis from didactic psychoeducation to interaction); we maximized the potential for individual feedback and sharing of perspectives by completing roleplay and brainstorming activities as a group rather than in dyads. In developing additional group activities, we drew upon Neumark-Sztainer’s guide for parents of adolescents (2005). We focused on how to communicate healthy messages about body shape, weight, and eating; on being prepared when certain situations arose (e.g., hearing your daughter say, “I’m too fat to wear those jeans.”); and on strategies for challenging unhealthy messages from peers and media (e.g., discussing with daughters media images or peer “fat talk”).

Third, we incorporated more opportunities for interaction between mothers and daughters through modification of the homework exercises, drawing on materials provided by Stice and Presnell (2007) and Neumark-Sztainer (2005). The following is an example of two complementary homework exercises (completed between Sessions 3 and 4), adapted from the “Behavioral Challenge” exercise in *The Body Project* book from the series, *Programs That Work*:

Your first assignment is to think about some of the things you avoid doing because of body image concerns (e.g., wearing shorts, exercising in public) and pick something you will do this week. In addition, we would like you to discuss your behavioral body challenge with your daughter and, if possible, allow her to see you confronting this challenge. Your second assignment is to initiate a conversation with your daughter about things she may not do because of her body image concerns. Please encourage her to choose one of these activities and do it at some point during the week. Then, encourage your daughter to share with you her experiences. (Stice & Presnell, 2007, p. 58)

Each homework exercise concluded with a structured interaction between mother and daughter. Mother–daughter interaction exercises ranged from setting aside time for a conversation about the experience of completing the homework, to mothers modeling healthy body image behaviors, to making a pact stating individualized, concrete behaviors mother and daughter will do to maintain healthy body images over time. All of these changes were made in accordance with Trost’s (2006) recommendations for future development of the program.

Results

Preliminary analyses

Results of the diagnostic assessment conducted with an initial sample of 46 mothers regarding their daughters (via the C-DISC program) indicated that whereas one girl met intermediate status,

no girls achieved a positive diagnosis for an eating disorder, and thus none were excluded based on this criterion. However, 14 dyads were screened out on the basis of the daughters being satisfied with their bodies to an extent that would obviate the need for their mothers' workshop participation. In addition, prior to the start of the workshops, one dyad (assigned to the intervention condition) dropped out of the study due to scheduling conflicts, but this daughter's diagnostic and body satisfaction results did not differ from those of the remaining participants. The substantive sample, then, consisted of 31 mother–daughter dyads. Random assignment procedures resulted in 15 dyads being assigned to the intervention condition and 16 dyads being assigned to the control condition. Finally, all mothers attended all four workshop sessions and none of the mothers or daughters participated in any other type of body image or eating treatment, training, counseling, or program.

Among the 31 girls comprising the final sample, responses to the Body Parts Dissatisfaction Scale revealed that the only body part any girls wished to be bigger was the chest ($n = 7$); this subscale, then, was excluded in the main analyses. Otherwise, girls either did not select the body part (presumably indicating contentment) or they wished it were smaller. Finally, the mean BMI score for the full sample was 22.59 ($SD = 3.35$; range = 16.8–31.5).

Main analyses

The main analyses were tests of differences between the intervention and control group at posttest (1 week following the last workshop session) and then again at follow-up (3 months later). Following guidelines for the analysis of pretest, posttest, follow-up designs (Huck & McLean, 1975; Rausch, Maxwell, & Kelley, 2003), we conducted between-subjects ANCOVAs to examine differences between the intervention and control groups. First, we conducted all tests controlling for pretest levels of the variable under study. We then re-conducted each test, this time also controlling for the girls' BMIs. Table 1 presents the group means, standard deviations, and ranges of each of the measured variables by condition at pretest, posttest, and follow-up.

The first set of analyses was a test of group differences at the posttest. We first tested for group differences in girls' perceptions of the amount of pressure they felt from their mothers to be thin. Results of a between-subjects ANCOVA, controlling for pretest levels of this variable, indicated that girls whose mothers had been in the intervention group perceived significantly less pressure from their mothers to be thin than did girls whose mothers had been in the control group, $F(1, 28) = 8.99, p = .006$ —an effect that is of medium size (Cohen's $d = .67$). When we controlled also for BMI, this finding remained significant: $F(1, 27) = 9.98, p = .004 (d = .73)$.

Next we tested for group differences in body dissatisfaction as measured by the Body Dissatisfaction subscale of the EDI. Results of an ANCOVA controlling for pretest levels of body dissatisfaction yielded no evidence of a group difference, $F(1, 28) = .20, p = .66 (d = .08)$. When we controlled for BMI, this result remained nonsignificant: $F(1, 27) = .16, p = .69$.

Analysis of responses to the Body Parts Dissatisfaction Scale, however, yielded different findings. Results of an ANCOVA controlling for pretest levels of the number of body parts girls wished were smaller indicated that at posttest, girls in the intervention group, compared to those in the control group, wished that significantly fewer of their body parts were smaller, $F(1, 28) = 9.09, p = .0054$ —an effect that is of medium size ($d = .44$). When we controlled also for BMI, this effect remained significant, $F(1, 27) = 7.42, p = .01$. Additionally, an ANCOVA controlling for pretest levels of the number of body parts with which girls were content indicated that at posttest, girls in the intervention group, compared to those in the control group, were content with a significantly greater number of their body parts, $F(1, 28) = 6.61, p = .02$ —an effect that is of medium size ($d = .41$). When we controlled as well for BMI, this result remained significant, $F(1, 27) = 5.75, p = .02$.

Finally, we tested for group differences in drive for thinness. Results of a between-subjects ANCOVA indicated no evidence of a significant difference in the groups, $F(1, 28) = .15, p = .70 (d = -.05)$. Controlling as well for BMI, results remained nonsignificant: $F(1, 27) = .69, p = .41$.

Table 1
Descriptive statistics of the measured variables at each time point by condition.

Variable	Intervention condition ($n = 15$)		
	Pretest	Posttest	Follow-up
Maternal pressure to be thin	14.80 (3.30) 9–21	12.40 (2.61) 9–17	11.20 (1.97) 9–15
Body dissatisfaction (EDI)	34.53 (8.21) 20–50	31.40 (8.49) 14–45	31.07 (6.43) 18–44
Body parts dissatisfaction			
Number of parts wished smaller	3.40 (1.76) 0–6	1.87 (1.55) 0–5	1.93 (1.71) 0–5
Number of parts with which content	3.40 (1.96) 0–7	4.87 (1.64) 2–7	4.67 (1.68) 2–7
Drive for thinness (EDI)	21.00 (7.58) 11–42	19.00 (7.94) 8–37	16.73 (5.86) 9–32
Variable	Control condition ($n = 16$)		
	Pretest	Posttest	Follow-up
Maternal pressure to be thin	15.94 (6.56) 9–28	16.06 (5.57) 9–29	15.06 (5.90) 9–27
Body dissatisfaction (EDI)	31.31 (11.03) 14–53	30.56 (11.79) 13–54	32.81 (11.05) 16–53
Body parts dissatisfaction			
Number of parts wished smaller	2.44 (1.93) 0–6	2.69 (2.12) 0–6	2.25 (2.02) 0–6
Number of parts with which content	4.19 (2.07) 0–7	4.00 (2.48) 0–7	4.69 (2.06) 1–7
Drive for thinness (EDI)	20.13 (7.29) 10–31	19.38 (8.16) 7–34	19.88 (8.03) 8–34

Note. Presented first are means and SDs (in parentheses), followed by variable ranges. EDI = Eating Disorder Inventory subscale.

The second set of analyses was a test of group differences at follow-up, which occurred 3 months following the posttest. As with the previous analyses, in the first ANCOVA in each set, we controlled for pretest levels of the variable being tested, and in the second ANCOVA in each set, we additionally controlled for girls' BMIs. We first tested for group differences in girls' perceptions of the amount of pressure they felt from their mothers to be thin. Results indicated that girls of mothers who had been in the intervention group perceived significantly less pressure from their mothers to be thin than girls whose mothers had been in the control group, $F(1, 28) = 7.37, p = .01$ —an effect that is medium-size ($d = .72$). When we controlled also for BMI, results of the ANCOVA remained significant: $F(1, 27) = 11.58, p = .002$ —and the effect was large ($d = .87$).

Next we tested for group differences in body dissatisfaction as measured by the Body Dissatisfaction subscale of the EDI. Results indicated no significant group differences on this variable. In particular, an ANCOVA controlling only for pretest levels of body dissatisfaction yielded no evidence of statistically significant group difference, $F(1, 28) = 1.46, p = .23$ ($d = -.19$), and controlling as well for BMI had no discernable effect: $F(1, 27) = 1.05, p = .31$.

Analyses of the Body Parts Dissatisfaction Scale yielded somewhat different results with regard to body dissatisfaction. Specifically, results of an ANCOVA controlling for pretest levels of the number of body parts which girls wished were smaller remained fewer than the number of parts indicated by girls in the control group, but this difference was not statistically significant, $F(1, 28) = 2.34, p = .14$ ($d = .17$), and results were unchanged when BMI also was controlled, $F(1, 27) = 1.8, p = .19$. Additionally, an ANCOVA controlling for pretest levels of the number of body parts with which girls were content indicated that the number of parts with which girls in the intervention group were content remained greater than the number of parts indicated by girls in the control group but, again, this difference was not statistically significant, $F(1, 28) = .50, p = .48$ ($d = .01$) and results were unchanged when BMI also was controlled, $F(1, 27) = .49, p = .49$.

Finally, we tested for group differences in drive for thinness at follow-up. Results of a between-subjects ANCOVA indicated possible evidence of a significant difference in the groups, $F(1, 28) = 3.06, p = .09$, that, when re-conducted also controlling for BMI, evidenced itself clearly: $F(1, 27) = 4.87, p = .04$. This effect was of medium size ($d = .66$).

Discussion

The *Healthy Girls Project* is, to our knowledge, the first ecologically based, targeted program aimed specifically at preventing the development of body issues in middle-school girls. Several results are of note. First, after mothers participated in the workshop series, their daughters perceived significantly less pressure from them to be thin, compared to girls whose mothers had not participated in the workshop series. This effect held when controlling for both baseline levels of perceived pressure and the girls' BMIs. Furthermore, this effect still was apparent 3 months later, suggesting that mothers who enrolled in the intervention may have continued to demonstrate their newly learned attitudes and behaviors over at least this interval. Certainly, the content of the workshop, including its psychoeducational and behavioral components, were designed to be both easy to understand as well as transportable to the variety of contexts in which mothers and daughters might find themselves. For example, mothers were taught to recognize instances of the thin-ideal standard as portrayed by various media and encouraged to discuss instances with their daughters as they occur in the girls' environments (e.g., on billboards, in magazines, on television). The simplicity of this component likely rendered its information easy to remember and its exercise in various contexts simple.

Second, the program's efficacy in terms of intervening in the girls' body dissatisfaction trajectories was mixed and seemed to depend on the measurement tool used. On the one hand, according to scores on the Body Dissatisfaction subscale of the EDI, there were no significant differences across the intervention and control groups at either posttest or follow-up. On the other hand, according to responses on the Body Parts Dissatisfaction Scale, there were noticeable differences across the groups at both posttest and follow-up. Specifically, at posttest, the intervention group wished that significantly fewer of their body parts were smaller and they were content with significantly more of their body parts than was the control group. This general trend continued at follow-up 3 months later although it did not reach statistical significance. The difference in results—across the EDI's Body Dissatisfaction subscale and the subscales of the BPDS—may be related to how girls of this age perceive the wording of the measures and themselves in relation to the wording. The EDI's Body Dissatisfaction subscale (which has been used successfully with adolescents) asks about the respondent's frequency of various thoughts regarding four body parts (e.g., "I think that my stomach is too big") and about the frequency of one's satisfaction with one's overall shape. The BPDS lists seven body parts and leaves an option for the girl to write in any other body part under "other" and then, if she has a wish to change a body part, to indicate the direction of that change (either "smaller" or "bigger"). In this way, the BPDS may offer greater opportunity for more straightforward responding by this age group (e.g., by avoiding asking how frequently one thinks her, for example, thighs are too large) and also by allowing girls to indicate in what way they wish various body parts were different; the BPDS also provides a broader list of body parts than does the EDI's Body Dissatisfaction subscale. Clearly, however, it cannot be discerned from the results of just this study, whether the BPDS is any better suited for use with young adolescents than are other measures of body dissatisfaction, and further study, of course, is needed.

Finally, support for a time-delayed effect emerged with regard to intervention program girls' drive for thinness. 1 week after the workshop concluded, no significant difference between intervention and control groups was evident; however, at follow-up, a clear difference emerged when controlling for BMI, with girls whose mothers were in the workshop reporting a significantly lower drive for thinness than girls whose mothers were not. It may be that whereas intervention group girls immediately perceived a difference in pressure to be thin, correspondent changes in their behavior should not necessarily be expected to occur immediately.

Results of this study suggest that a brief intervention with mothers can influence girls' reports of eating disorder precursors, and these results have several implications for mothers of adolescent girls and those working with girls and their families. First, given the focus on body parts as objects of dissatisfaction within this age group, individuals living or working with adolescent girls likely would benefit from attending not just to girls' expressions of overall dissatisfaction (e.g., "I am way too fat to wear that."), but also to seemingly innocuous comments (e.g., "I wish my legs looked more like hers."), as these body part comments may be more sensitive indicators of body dissatisfaction. Second, results of this study underscore the importance of mothers as gatekeepers of the messages that shape their adolescent daughters' developing body image. Finally, psychologists working with families and providing outreach programs should be cognizant of the potential that mothers hold as agents of their daughters' health.

Some limitations of the present study provide direction for future efforts. First, despite a wide range of household incomes reported by mothers in our sample, it was predominated by

middle- and upper-middle-class European Americans and, thus, not representative of the general population. We encourage researchers to consider conducting multi-site intervention efforts to increase sample diversity. Second and related, despite the wide recruitment effort, our sample was relatively small. This small sample size—a common issue in prevention research—may have been due to parents' reluctance to identify themselves as the parents of adolescents with body image concerns. Indeed, the difficulty of engaging parents in eating disorder prevention programs has been noted frequently (e.g., Haines, Neumark-Sztainer, Perry, Hannan, & Levine, 2006; McVey, Tweed, & Blackmore, 2007; see also Levine & Smolak, 2009). The sample size, however, likely prevented existing effects from emerging more clearly. Indeed, a power analysis indicated that the study was slightly underpowered: Power to detect mean differences in the present design, with alpha set at .05, was calculated at .765. Because .80 is the conventional target, it can be inferred that the present study was slightly underpowered. Third, use of an assessment-only, waitlist control, instead of a minimal-intervention control, is not ideal, as it introduces the possibility of eliciting, and not being able to rule out, expectancy effects. Although results of Stice and Shaw's (2004) meta-analysis suggest that expectancy effects do not appear to produce artificial findings, we encourage use of minimal-intervention control conditions whenever possible to reduce this concern. Fourth, an additional follow-up assessment conducted, for example, 6 months or 1 year following the intervention would provide needed information regarding the potential long-term efficacy of this program. Finally, only mothers, rather than mother–daughter dyads, were included in the intervention. Drawing on the ecological perspective, we sought to focus on the body- and eating-related context that mothers create and maintain, and thus have the power to dismantle. We found that maternal behavior could be modified such that its alteration was discernable in daughters' reports, even with no intervention applied directly to daughters. Furthermore, although dyadic interventions might provide opportunities to address mother–daughter interaction regarding body issues, an effective mother-only intervention has the potential to facilitate positive change even when adolescents resist involvement in treatment.

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