Influences on Body Image and Disordered Eating Among Secondary School Students

William Thatcher and Deborah Rhea

ABSTRACT

This study examined whether behavioral differences (exercise, dieting, changing eating habits, taking pills, or vomiting/taking laxatives to lose weight) exist when identifying the major influencing factors (media, family, friends, teacher/coach, and doctor/nurse) among Black and White men's and women's self-perceptions of body weight. Respondents (N=3,957) to the 1999 South Carolina Youth Risk Behavior Survey were examined on six questions pertaining to body image influences and behavioral activities to manipulate body weight and/or body image. Chi-square and logistic regression analyses were used to show associations among the chosen variables. Body mass index scores for participants were generated and compared with concerns about weight. More than 40% of participants were concerned about their weight and participated in deleterious behaviors to manipulate their weight and self-perception of body. Mass media and family were the most influential factors in participant's self-perception of body. Exercise and dieting were the most prevalent ways to manipulate body weight. Significant differences were determined for each race and gender group with regard to types of activities intended to manipulate their body weight. Policy changes to media advertisements and innovative interventions should be developed that can influence adolescents to choose a healthy body size and to be comfortable with the varieties of body shapes.

Body image concerns are at the heart of adolescence for boys and girls. As children reach puberty and begin to develop secondary sex characteristics, numerous boys adopt strategies to increase muscle tone, and numerous girls adopt strategies to lose weight or retard physical growth (e.g., breasts, broader hips) (McCabe, Ricciardelli, & Banfield, 2001; McCabe, Ricciardelli, & Fenmore, 2002; Ricciardelli, 2001). Consequently, studies have shown that girls are generally more negative about their bodies, develop lower self-esteem, and are concerned more with having an ideal, thin shape than boys (Marcotte, Potvin, & Papillon, 2002; O'Dea, & Abraham, 2001; Rhea, 1999; Siegel, 2002). However, many boys of all ages report dissatisfaction with their bodies, often associated with reduced self-esteem to be bigger (Cohane & Pope, 2001) or enhance muscle tone (McCabe et al., 2002). Seeking effective dieting strategies (e.g., liquid diets, no-fat diets, no-carbohydrate diets) to create a perceived ideal body shape can compound this psychological battle (Overdorf & Gill, 1994; Petrie et al., 1996). These diets can lead to other abnormal practices such as the misuse of vomiting, laxatives, diuretics, and diet pills to enhance one's body image. Individuals with warped body images and the associated low self-esteem lay the groundwork for weight preoccupation and disordered eating (President's Council on Physical Fitness and Sports Report, 1997).

Research has shown that several factors can be influential in the development of poor body image especially for girls, including sociocultural pressures (media, peers), family pressures, and individual self-evaluation of what is acceptable. One of the most influential, mass media, is ubiquitously present in youths' lives via television, movies, magazines, and advertisements. Several recent studies have supported

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media influences on one's likelihood to develop a warped body image, engage in disordered eating and dieting methods, and to have lower self-esteem through reading beauty and fashion magazines for women and fitness magazines for men (Hofschire & Greenberg, 2002; Posavac, & Weigel, 2001; Stice, Spangler, & Agras, 2001; Thomsen, Weber, & Brown, 2002) and weight comparisons of model targets for men and women (Hofschire & Greenberg, 2002; Jones, 2001; Posavac & Weigel, 2001). Such an example is seen in Pipher's (1994, 1996) clinical work that scrutinizes how media advertisements set unrealistic expectations of women's physical appearance. Additionally, some research has indicated that mass media has been determined to be the major driving force in fostering body concerns in adolescent girls, more so than even the pressure exerted by the most popular peers, who were generally found to be thin, pretty, and idealized (Wertheim, Paxton, Schultz, & Muir, 1997). Media messages such as what to wear, how much to weigh, or how to sculpt muscles may contribute to the worries about physical appearance and self-evaluations experienced throughout adolescence. In past years, and even more so today, depicting ultra-thin women who are often the most successful and beautiful of the portrayed characters has become the norm for marketing campaigns.

Similar to media influences, a family's role also has been shown to impact a child's body image perception both positively and negatively. It has been noted that a sense of security with a parental figure seems to instill the positive self-image, which includes body image (Offer, Howard, Schonert, & Ostrov, 1991). Boys who reported receiving messages from mothers to eat less or lose weight, reported eating less to lose weight. Also, boys who reported receiving messages from fathers to exercise more reported engaging in more exercise for altering body shape and size of muscles. Similarly, both mothers and fathers were shown to act as positive and negative role models for girls in relation to body change methods (Ricciardelli, 2001; Ricciardelli, McCabe, & Banfield, 1999), although when asked about diet and weight discussions "at home," most girls did not mention their father at all (Wertheim et al., 1997). Familial relationships also play a role in the development of eating disorders, particularly the mother–daughter relationship (Hill & Franklin, 1998). Pike and Rodin (1991) found that mothers who were highly concerned with thinness and dieting appeared to be more likely to have daughters who were disordered in their eating. It has also been suggested that parents of anorexic girls do not differ in their own level of disordered eating, level of restraint, overvaluation of thinness, or related attitudes (Garfinkel et al., 1983). Such mothers are highly self-critical about their own weight and appearance and apply the same standards to their daughters to achieve ideals of thinness and attractiveness that would put them at risk for becoming eating disordered (Pike & Rodin, 1991).

Peer and family relationships have been associated with adolescent self-evaluation. Peer influences such as social acceptance, peer relationships (Moran & Eckenrode, 1991), and peer popularity (Lieberman, Gauvin, Bukowski, & White, 2001) contribute to adolescents' evaluation of the self. Current research suggests girls' dieting practices are due to social factors such as teasing (Lieberman et al., 2001), other girls' verbalized concerns, wanting to fit in or please others, friends' dieting (Wertheim et al., 1997), or being promoted as most popular for being thin and cute (Lieberman et al., 2001). Limited research in this area has generally involved small sample sizes and has not cross-examined all factors, which demonstrates a need for the current study.

Two major limitations of body image and disordered eating research have been the almost exclusive focus on White females and the influential pressures adults may exhibit with students (i.e., teachers, coaches, doctors, and nurses). Often the racial–ethnic background of participants as well as gender differences are excluded or not reported. Very few studies have examined the influences that teachers/coaches may have on adolescents to lose weight (Biesecker & Martz, 1999; Fender-Scarr, 1999; Griffin & Harris, 1996). Of these studies, Griffin and Harris (1996) showed that even though coaches did not recommend dangerous weight control techniques to their athletes, the coaches used these techniques themselves and often communicated their concerns with weight. The study suggested that athletes may interpret these concerns as an indirect communication to lose weight. Other studies have shown that coaches have a significant influence on athletes to lose weight and be concerned about body image because of their negative comments about appearance (Biesecker & Martz, 1999; Fender-Scarr, 1999). Of the few studies that examine ethnic differences (i.e., non-White female and male populations), controversy exists regarding the frequency of occurrence. For example, some studies have suggested Black females are less affected by sociocultural pressures to be thin and perceive their body size to be more appropriate than White females (DiGioacchino, Sargent, & Topping, 2001; Rhea, 1999; Thomas, James, & Bachmann, 2002). However, another study showed Black and White women equally at-risk for negative body image perceptions and higher eating disordered behaviors (Siegel, 2002). Research has shown that when compared with White adolescent girls, Black adolescent girls perceive their parents and both male and female friends would choose a significantly heavier female body size as ideal (Parnell, Sargent, Thompson, Duhe, Valois, & Kemper, 1996). Additionally, when compared with White girls, Black girls' body size preference was significantly more influenced by family members (Thompson, Sargent, & Kemper, 1996). This sociocultural factor may possibly contribute to the higher percentage of obesity found in the Black female population. Within the Black culture, the acceptance of increased body weight is not viewed in a negative context by adolescents and, in fact, may serve as a source of reinforcement (Kemper et al., 1994). On the basis of limited and at times contradictory research on diverse populations, body image issues and

eating disordered behaviors appear to be an emerging health issue for not only White adolescent girls, but boys and girls of varying racial and ethnic backgrounds. Therefore, the purpose of this study was to examine what behavioral differences (exercise, diet, pills or laxatives taken to lose weight, or vomiting to lose weight) exist when identifying the major influencing factors (media, family, friends, teacher/coach, and doctor/nurse) among Black and White boys' and girls' self-perception of body weight.

METHOD

Sampling

A total of 71 of 241 public high schools in South Carolina were selected systematically using a random start within each stratum, proportional to the minority enrollment. Seventy-one schools were randomly selected to obtain a 6,500-student sampling. The survey was administered to 58 of the sampling frame's 71 schools (81.7%), totaling 5,562 of the proposed 6,500 public high school students. Of these 5,562 students, a total of 4,353 students completed questionnaires for a student response rate of 78.3%. The overall response rate (81.7% x 78.3%) was 63.9%. These data were determined weighted by the Centers for Disease Control and Prevention (CDC) and are generalizable to all regular public high school students in South Carolina.

Study protocol required passive-consent, parental notification forms to be distributed. Less than 1% of the study population (n=69) did not participate in the study due to parental decline. The survey was administered anonymously, and students were informed participation was voluntary. Completed answer sheets were placed by the student in an envelope and sealed before the administrator left the survey area. The university's institutional review board approved these methods.

Instrumentation

A modified version of CDC's 1999 Youth Risk Behavior Survey was used for this study. This version contained the CDC's 84 core questions measuring demographics and the original six risk-taking behavior categories—intentional and unintentional injuries; tobacco use; alcohol and other drug use; sexual activity; physical activity; and nutritional habits—and added 15 additional questions within these categories and one new construct regarding preventive health care. Additionally, body mass index (BMI) was calculated for each participant using self-report height and weight questions placed within the demographics section of the questionnaire.

For the purpose of this study the following six questions were examined and students were instructed to select only one response per item.

(1) Who or what influences you the Most to be concerned about your weight?

(2) During the past 30 days did you exercise to lose weight or to keep from gaining weight?

(3) During the past 30 days did you eat less food, fewer calories, or foods low in fat to lose weight or to keep from gaining weight?

(4) During the past 30 days did you go without eating for 24 hours or more (also called fasting) to lose weight or to keep from gaining weight?

(5) During the past 30 days did you take any diet pills, powders, or liquids without a doctor's advice to lose weight or to keep from gaining weight? (Do not include meal replacement products such as Slim Fast)

(6) During the past 30 days did you vomit or take laxatives to lose weight or to keep from gaining weight?

From this point on, these variables will be referred to as: Influence, Exercise, Dieting, Fasting, Pills, and Laxatives, respectively.

Each question had a dichotomous yes/no format, with the exception of the question pertaining to influence, which offered the following response options.

(1) I am not concerned about my weight

(2) The media (TV, movies, magazines)

(3) Someone in my family who is concerned about my weight

(4) My friends who express concern about my weight

(5) Teacher or coach who is concerned about my weight

(6) Doctor or nurse who is concerned about my weight

Data Analysis

The statistical methods used in this study consisted of three procedures: item analysis, cross-tabulations and their respective chi-squares, and logistic regression. To obtain meaningful measures of association, especially using logistic re-gression, five dichotomies were created: Media, Family, Friends, Teacher or Coach, and Doctor or Nurse, each compared with All Other.

The predictor or regression variables chosen for this study are as follows. During the past 30 days did you …

- Exercise to lose weight or to keep from gaining weight?
- Eat less food, fewer calories or foods low in fat to lose weight or to keep from gaining weight?
- Go without eating for 24 hours or more (also called fasting) to lose weight or keep from gaining weight?
- Take any diet pills, powers or liquids without a doctor's advice to lose weight?
- Vomit or take laxatives to lose weight or to keep from gaining weight?

Each of these questions offered only two choices: yes or no.

Cross-tabulations of each of the five dichotomies of influence and the five predictors—Exercise, Dieting, Fasting, Pills, and Laxatives—were carried out complete with odds ratios and respective p-values from chi-squares and confidence limits on the odds ratios. The results of these two-by-two contingency tables provided measures of associations when ignoring the other four predictor variables.

Twenty logistic regressions were performed on each race and gender group, using the five dichotomies of influence as the response variables, and Exercise, Dieting, Fasting, Pills, and Laxatives as the set of predictor variables. Because all of the predictors are themselves dichotomies, logistic regression is exactly equivalent to analyzing the data using log-linear models.

RESULTS

The 4,353 respondents were comprised of 2,341 girls (53.8%) and 2,012 boys (46.2%). The grade level breakdown was 1,369 ninth graders (31.4%), 1,020 tenth graders (23.4%), 1,008 eleventh graders (23.2%), 939 twelfth graders (21.6%), and 17 students reported being ungraded (0.4%). Black students numbered 1,831 (42.1%) compared with 2,179 White students (50.1%), and 343 students identified themselves as either Hispanic or "Other" (7.9%). Due to the small number of students indicating Hispanic and Other, these students have been removed from analysis and will not be mentioned further. With these students removed, the total sample collected for this study was 4,010. Further, 3 Black students and 50 White students were removed from the analysis due to missing variables of interest or unreadable answer sheets, leaving 3,957 subjects for this study.

Of the 3,957 student participants, 981 were Black girls, 1,114 were White girls, 847 were Black boys, and 1,015 were White boys. Means and standard deviations by race and gender for body weight, height, and BMI are included in Table 1. Participant responses by race and gender to sources of influence—Media, Family, Friends, Teacher or Coach, and Doctor or Nurse—are presented in Table 2. Participant responses by race and gender to predictor variables—Exercise, Dieting, Fasting, Pills, and Laxatives—are presented in Table 3.

Initial logistic regressions were completed for each race/gender group on the predictor variables of interest to each category of influence: Media, Family, Friends, Teacher or Coach, and Doctor or Nurse. After removing the nonsignificant predictor variables from the logistic regression models, we were left with those variables that held significance for each category of influence: Media, Family, Friends, Teacher or Coach, and Doctor or Nurse. Final logistic regressions for each race/gender group by category of influence and their respective predictor variables that held at the studies set p-value ($p<.01$) are located in Table 4.

Table 1. Height, Weight and BMI Distributions for Sample Participants

Group	Height M (SD)	Weight M (SD)	BMI M (SD)	BMI Range
Black females (n=981)	1.64 (.078)	63.65 (13.62)	23.64 (4.83)	14.00-47.12
White females (n=1114)	1.65 (.067)	58.85 (11.18)	21.45 (3.70)	14.89–47.11
Black males (n=847)	1.77 (.094)	74.10 (16.54)	23.76 (4.89)	11.41-60.23
White males (n=1015)	1.77 (.080)	72.45 (16.05)	22.97 (4.43)	14.70-48.80

Table 2. Race/Gender Distribution of Response to "Who or what influences you the Most to be concerned about your weight?"

Group	Black Female N %	White Female N %	Black Male N %	White Male N %
No Influence	527 (51.82)	520 (44.98)	520 (63.88)	734 (71.75)
Media	184 (18.09)	418 (36.16)	84 (10.32)	76 (7.43)
Family	179 (17.60)	147 (12.72)	89 (10.93)	87 (8.50)
Friends	67 (6.59)	41 (3.55)	40 (4.91)	55 (5.38)
Teacher/Coach	8 (0.79)	9 (0.78)	64 (7.86)	55 (5.38)
Doctor/Nurse	52 (5.11)	21 (1.82)	17 (2.09)	16 (1.56)

The current investigation identified the media as having the strongest association among influence and the predictor variables in each of the studied groups. Of the five dichotomies of influence the media was the most influential factor in eliciting one or more of the predictor variables, namely, exercising, dieting, fasting, or all. Of particular interest was the significant affect the media had on White boys and both groups of girls and the specific behaviors to lose weight. The results showed that the media was approximately two and a half times more likely to influence Black and White girls considered to be dieting to lose weight (odds ratio [OR]=2.51; $p<.0001$ and OR=2.67; $p<.0001$, respectively). Interestingly, the media was almost six times more likely to influence White boys considered to be dieting to lose weight (OR=5.71; $p<.0001$). The results also revealed that the media had a stronger impact on girls' behavior to lose weight compared with boys, with Black and White girls exhibiting multiple behaviors, that is, exercising and dieting as a consequence of media exposure. White girls were also one and a half times more likely to fast due to this association. Also of interest, boys were influenced by only one predictor variable each, and that variable was not consistent for the two groups. Media had a stronger impact on Black boys to exercise to lose weight (OR=2.39; $p<.0004$), whereas media was more influential with White boys to diet to lose weight (OR=5.71; $p<.0001$).

The second most influential factor in eliciting one or more of the predictor variables was the family. The results revealed that family influenced Black girls to lose weight

Table 3. Race/Gender Distribution of Responses to Predictor Variables: Use of Exercise, Dieting, Fasting, Pills, and Laxatives to lose weight.

Group	Black Female N %	White Female N %	Black Male N %	White Male N %
Exercise	533 (52.41)	798 (69.03)	389 (47.79)	473 (46.24)
No Exercise	484 (47.59)	358 (30.97)	425 (52.21)	550 (53.76)
Dieting	390 (38.35)	668 (57.79)	187 (22.97)	237 (23.17)
No Diet	627 (61.65)	488 (42.41)	627 (77.03)	786 (76.83)
Fasting	144 (14.16)	216 (18.69)	89 (10.93)	66 (6.45)
No Fasting	873 (85.84)	940 (81.31)	725 (89.07)	957 (93.55)
Pills	62 (6.10)	121 (10.47)	45 (5.53)	42 (4.11)
No Pills	955 (93.90)	1035 (89.53)	769 (94.47)	981 (95. 89)
Laxatives	62 (6.10)	85 (7.35)	46 (5.65)	21 (2.05)
No Laxatives	955 (93.90)	1071 (92.65)	768 (94.35)	1002 (97.95)

with more than one of the predictor variables (i.e., exercise and fasting); whereas the boys and the White girls were only influenced by the family to use one method of losing weight (e.g., dieting or exercising). White girls were almost six times more likely than Black girls to report dieting due to the influence of parents or family members (OR=5.75; $p<.0001$). Similarly, the family was found to be influential among White boys, who were almost four times more likely than Black boys to report dieting due to family concerns about their weight (OR=3.73; $p<.0001$). Among Black boys and girls, the family was shown to be influential in increasing the likelihood that these subjects would use exercise as a means to lose/control weight. The Black adolescents from this study were more than twice as likely as White adolescents to exercise to lose weight due to familial influence (OR=2.79; $p<.0001$ and OR=2.20; $p<.0001$ for boys and girls, respectively).

Findings from this study indicate that friends were also influential in adolescent behaviors related to body change. White girls were more likely than Black girls to exercise to lose weight due to friends' concern about their weight (OR=0.34; $p<.0007$), although this effect was not as pronounced as the media's influence on this group to exercise. As a result of peer influence, White boys were five and a half times more likely than Black boys (OR=5.56; $p<.0001$) to report consuming pills to lose weight. White boys were the only group to exhibit this particular behavior.

The present study showed Black boys to be strongly influenced by doctors/nurses in their self-perception of body image. Black boys were five times more likely than White boys to report dieting due to advice about their weight from doctors/nurses (OR=5.00; $p<.0013$) and were the only group to be significantly influenced by these professionals. The reason why this response variable impacted this group so significantly is unknown, although the BMI scores identified in this sample were highest for Black boys (BMI=23.76). Further research is needed to explore this association and the lack of association among the other three-race/gender groups.

The influence of teachers/coaches on body image perceptions was significant only among White boys. These adolescents were more than twice as likely as Black boys to report dieting as a result of advice expressed by teachers/coaches (OR=2.12; $p<.0091$). Again, additional research is needed to explore this association and the lack of association among the other three-race/gender groups.

DISCUSSION

When researchers try to explain why associations occur, they are often left only with more questions. Using survey research to draw conclusions on nearly 4,000 students' decisions to participate in a particular behavior is very difficult, if not impossible. The data from this study was not intended to show a cause-and-effect relationship; rather, it was intended to demonstrate that an individual's self-perception of body weight is influenced by a myriad of outside sources, and the resulting behaviors to manipulate those perceptions are varied. This research can, and should, be used as a stepping-stone to address more focused questions such as "why are individuals in specific race/gender groups affected more by the media as a means of developing their self-perception of body weight?" or "why do White students indicate that friends have an impact on their self-perception of body weight, whereas Black students do not?"

Additionally, this research may prove to be a beneficial assessment for programming efforts to address the different behaviors used to manipulate body weight. The differences in this study suggest that these behaviors do indeed vary among the race/gender groups, and individual programming efforts may be warranted. One limitation of this study that must be noted is the recognition that these behaviors may not be unhealthy or detrimental to the student. For example, dieting and exercising to lose weight in this age of overweight adolescents may not be an unwanted behavior and may just need to be monitored to assure that students understand the ramifications

Table 4. Summary of Statistically Significant Logistic Regressions for Response Variable: Influence and Predictor Variables: Exercise, Dieting, Fasting, Pills, and Laxatives.

Race and Gender	OR	99% CI	p
Black Female			
Media			
Exercise	1.87	1.26-2.76	.0017
Dieting	2.51	1.74-3.62	< .0001
Family			
Exercise	2.20	1.54-3.13	< .0001
Fasting	2.09	1.39-3.13	.0004
White Female			
Media			
Exercise	2.33	1.65-3.28	< .0001
Dieting	2.67	1.96-3.64	< .0001
Fasting	1.66	1.20-2.29	.0019
Family			
Dieting	5.75	3.44-9.62	< .0001
Friends			
Exercise	0.34	0.18-0.63	.0007
Black Male			
Media			
Exercise	2.39	1.48-3.85	.0004
Family			
Exercise	2.79	1.74-4.48	< .0001
Doctor/Nurse			
Dieting	5.00	1.88-13.33	.0013
White Male			
Media			
Dieting	5.71	3.52-9.26	< .0001
Family			
Dieting	3.73	2.39-5.85	< .0001
Friends			
Pills	5.56	2.51-12.20	< .0001
Teacher/Coach			
Exercise	2.12	1.20-3.72	.0091

of excess. Additionally, we did not compare subjects with BMI >25 with those with BMI <25 to see which of these groups had a higher incidence of dieting or other behavior that might indicate potential eating disorders. Again, this study, although not intended to address such issues, may be used as a beginning to determine such future efforts.

The media was the most frequently reported of all the influencing factors within this study. Additionally, the media was found to be a statistically significant influencing factor in each of the four groups being concerned about their weight. The resulting behaviors associated with the media as an influencing factor may be interpreted positively or negatively. Exercising to lose weight may indeed be an appropriate behavior for losing weight among this population, and perhaps the media's influence in this area should be looked on as positive. The lack of association between media and exercise among the White male population however, may suggest certain media-based efforts are ineffective and therefore need to be tailored to specific groups. The media as an influencing factor on dieting may be a negative issue due to fad diets and quick fixes often exacerbated in the media and advertising. Further research on this issue may shed light on the type(s) of dieting versus the adolescents' knowledge and subsequent practice of healthy eating habits.

The findings examining the family's influence on White adolescents' self-perception of body image, again, can be interpreted positively or negatively. The fact that they are dieting may be problematic, because dieting is a short-term fix for a long-term problem. On the other hand, the BMI scores reflected in this population of White boys and girls, as a whole, did not indicate overweight (BMI=22.97 and 21.45, respectively). The lack of association between Black adolescents' families and dieting may be attributed to Black adolescents, particularly girls, perceiving their parents would choose as ideal a significantly heavier female body size (Parnell et al., 1996). Black girls were influenced the most by the family to lose weight by fasting in addition to exercise. This group was the only group to show more than one behavior to lose weight due to familial influences, which is contradictory to other research related to this racial group (Thompson et al., 1996). Due to the fasting and exercise techniques reported, concern should be given to whether these girls are at a greater risk for an eating disorder.

A significant association was determined for friends being influential on White boys' reported use of diet pills. This association is consistent with previous research, which reported White adolescent boys used diet pills as a means to control weight (Story, Neumark-Sztainer, & Sherwood, 1998). This impact of friends on subsequent behavior (pills for boys and exercise for girls) is found exclusively among White adolescents and supports the current literature

that suggests White subjects are more influenced by peer groups compared to their Black counterparts.

It is reasonable to conclude from this study that adolescents are concerned about their self-perception of body weight and how they are influenced to change it. For the most part the four race/gender groups were influenced by the media to either diet or exercise. Again, the fact that media has an impact on exercise patterns may be a positive position, although the media is a force that adolescents pay close attention to on a daily basis. The media should become more sensitive to how body shapes and sizes are extolled and admired at the expense of other qualities for adolescents. Future research should examine innovative interventions that may influence adolescents to choose a healthy body size and to be comfortable with the variety of body shapes as long as body fat is in check.

As noticed in this study's findings, promoting a healthy body image is difficult to accomplish when recognizing the strength of the media and family's influence. This study provides a rationale for developing health education programs to account for the myriad of activities and influencing agents young people use as a means to manipulate body weight and their own body image. Further, this study provides a preliminary look at the role race and gender may play in the development of such programs.

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