

RESEARCH ARTICLE

# Weight Control Beliefs, Body Shape Attitudes, and Physical Activity Among Adolescents

SCOTT B. MARTIN, PhD<sup>a</sup> DEBORAH J. RHEA, PhD<sup>b</sup> CHRISTY A. GREENLEAF, PhD<sup>c</sup> DORYCE E. JUDD, MS<sup>d</sup> HEATHER O. CHAMBLISS, PhD<sup>e</sup>

## ABSTRACT

**BACKGROUND:** Relatively little is known about how perceived weight controllability influences important psychological health factors among adolescents. Thus, the purpose of this study is to explore adolescents' weight controllability beliefs and how those beliefs influence weight-related attitudes and behaviors.

**METHODS:** Adolescents (N = 369, mean age = 13.14, SD = 0.95) enrolled in physical education completed a survey packet, which included demographic questions and items targeting obesity, body shape, and weight controllability beliefs.

**RESULTS:** Participants believed that fat children have weight problems because they consume too many calories, are lazy, have access to junk food, and lack self-control. Those who endorsed high weight controllability beliefs were more likely to indicate that a thin person, as compared to a fat person, would enjoy physical activity and be coordinated, have higher levels of personal weight and body shape satisfaction, and engage in vigorous physical activity more days per week.

**CONCLUSIONS:** Perceived weight controllability may be an important construct to study further, particularly in relationship to health- and weight-related attitudes and behaviors.

**Keywords:** adolescents health; weight controllability; weight stigma; overweight; body shape; physical activity.

**Citation:** Martin SB, Rhea DJ, Greenleaf CA, Judd DE, Chambliss HO. Weight control beliefs, body shape attitudes, and physical activity among adolescents. *J Sch Health*. 2011; 81: 244-250.

Received on November 9, 2009

Accepted on July 13, 2010

The physical health risks of youth obesity have gained national attention in recent years.<sup>1</sup> Overweight and obese youth are at increased risk of developing diseases typically seen in adults including heart disease, high blood pressure, insulin resistance, diabetes, cancer, and other conditions.<sup>2,3</sup> It is estimated that about one fourth (22%) of children and adolescents in the United States are overweight or obese<sup>4</sup> and future obesity prevalence rates are expected to rise to 40% by 2020.<sup>5</sup> Clearly, there is good reason for concern regarding the physical health risks associated with overweight and obesity among youth. However, the potential negative psychosocial aspects of obesity, such as poor body image (BI), social isolation, and stigmatization, are also relevant in the lives of youth.

Youth perceived as fat are often considered ugly, lazy, and unhealthy.<sup>6-8</sup> Overweight and obese youth are likely to face social stigma and rejection from their peers<sup>9,10</sup> because they are assumed to have negative personal and social characteristics, such as not having many friends and being unhappy, as well as negative physical and health characteristics, such as being unattractive and unhealthy.<sup>11</sup> Experiences of weight-based social stigma are associated with increased levels of depressive symptoms and decreases in self-esteem.<sup>12</sup>

Weight bias toward overweight and obese youth is likely due, in part, to the widespread belief that weight is controllable.<sup>13</sup> For example, Tiggemann and Anesbury<sup>14</sup> found that the majority of 4th through 6th graders in their sample believed that fat children were in control of their weight, eat too much, and

<sup>a</sup>Professor, (Scott.Martin@unt.edu), Department of Kinesiology, Health Promotion, and Recreation, University of North Texas, 1155 Union Circle #310769, Denton, TX 76203-5017.

<sup>b</sup>Professor, (D.Rhea@tcu.edu), Department of Kinesiology, Texas Christian University, TCU Box 297730, Fort Worth, TX 76129.

<sup>c</sup>Associate Professor, (Christy.Greenleaf@unt.edu), Department of Kinesiology, Health Promotion, and Recreation, University of North Texas, 1155 Union Circle #310769, Denton, TX 76203-5017.

<sup>d</sup>Lecturer, (Doryce.Judd@unt.edu), Department of Kinesiology, Health Promotion, and Recreation, University of North Texas, 1155 Union Circle #310769, Denton, TX 76203-5017

<sup>e</sup>Instructor, (Heather.chambliss@memphis.edu), Department of Health and Sport Sciences, University of Memphis, Field House 106, Memphis, TN 38152.

Address correspondence to: Scott B. Martin, Professor, (Scott.Martin@unt.edu), Department of Kinesiology, Health Promotion, and Recreation, University of North Texas, 1155 Union Circle #310769, Denton, TX 76203-5017.

could become thin if they tried exercising and eating less. In addition, over one third of the sample indicated that fat children do not use their willpower, cannot resist food, and do not exercise. Perceptions of weight controllability are important for a number of reasons, including the potential influence on social judgments of overweight and obese peers as well as influencing an individual's own self-evaluations.

Perceived weight controllability influences children's and adolescents' attitudes toward overweight peers.<sup>14-16</sup> Youth who perceive that a person's weight is within his or her control are likely to assign negative personal and social attributes to and have negative perceptions of overweight peers. To build upon this previous research,<sup>14-16</sup> we investigated the associations between adolescents' weight controllability beliefs and their perceptions of personal and social characteristics and physical health, as well as fitness characteristics of peers of varying body shapes.

Weight controllability beliefs and weight bias may also be associated with adolescents' own body attitudes and health behaviors, yet relatively little is known about how perceived weight controllability influences important psychological health factors (eg, body satisfaction) and health behaviors (eg, physical activity) among youth. Research among adults indicates that perceptions of weight controllability via exercise are positively associated with weekly exercise.<sup>17</sup> Although research on adolescents exists that indicates they are likely to endorse physical activity as a strategy to lose weight<sup>18</sup> and are likely to believe that fat children are in control of their weight,<sup>14</sup> less is known about how their weight controllability perceptions influence their BI and physical activity behavior. Thus, we also examined if and how adolescents' weight control beliefs were associated with BI and physical activity behavior.

## METHODS

### Participants

Participants were 369 (193 males, 154 females, 22 unreported) middle school physical education students in a major metropolitan public school district located in the southern United States. Students age ranged from 11 to 16 years (mean = 13.14, SD = 0.95) and were in grades 6 (16.1%), 7 (42.9%), and 8 (41.0%). More than half of the students (n = 246, 67.6%) identified themselves as non-White, whereas 32.4% (n = 117) identified themselves as White. Five participants did not report their race or ethnicity. These race/ethnicity percentages were representative of the school district.

### Instruments

Participants completed a demographic and background questionnaire, the Beliefs about Obesity

Scale,<sup>19</sup> the Body Shape Attitudes Visual Analog Scale (BSAVAS) (adapted from Hill and Silver<sup>20</sup>), and a single-item measure about general weight controllability beliefs (ie, How much control does someone have over his or her weight?).

The demographic and background section included 27 items. Participants reported their age, gender, race, current grade, grades in school, height, and current weight. Included in the demographic and background questionnaire were several items from the Youth Risk Behavioral Surveillance System (YRBSS),<sup>21</sup> 6 self-report physical activity and sedentary behavior (PASB) items, 4 BI items, and 6 weight management (WM) items. For the PASB items, participants reported the following: number of days they engaged in moderate, vigorous, and strengthening physical activities; number of sport teams they competed on during the last year; hours of TV viewed per day, and hours of computer or video game use per day. For the BI items, participants were asked to report how they would describe their weight (*very underweight, slightly underweight, about the right weight, slightly overweight, or very overweight*), their weight satisfaction (*very dissatisfied, sort of dissatisfied, sort of satisfied, very satisfied*), their body appearance satisfaction (*very dissatisfied, sort of dissatisfied, sort of satisfied, very satisfied*), and their ideal weight (in lbs). For the WM items, participants were asked what they are trying to do about their weight (*lose weight, stay the same weight, gain weight, not doing anything*) and if they had engaged in any activities, including exercising, food restricting, fasting, taking diet pills/powders/liquids, and vomiting or taking laxatives (*yes, no*), to control their weight.

The Beliefs about Obesity Scale<sup>19</sup> consists of 13 items related to beliefs about factors that contribute to obesity. Participants rated their agreement (1 = *really disagree* to 4 = *really agree*) with each statement following the stem "Children who are fat or obese have weight problems because . . ." Beliefs about obesity included personal choice factors (eg, they have poor eating behaviors and they are lazy couch potatoes), parental and family factors (eg, their parents let them eat junk food), medical factors (eg, they have a hormone problem), and psychosocial factors (eg, they have a low self-esteem). The internal consistency for the present sample was .75.

A visual analog scale was developed from Hill and Silver's<sup>20</sup> body shape attitudes visual analog measure to assess participants' endorsement of weight biased beliefs and body shape attitudes. The BSAVAS consisted of 19 items. Participants completed this measure 2 times, once in reference to a "fat" target (eg, an image of a heavy figure at the top of the survey page) and once in reference to a "thin" target (eg, an image of a slim figure at the top of the survey page). Participants were presented with same sex figures. Each item included 2 anchors (eg, Is very healthy—Is not at all

healthy, Is very good at sports—Is not at all good at sports) and a 100-mm line. Participants placed a mark on the line to represent their attitude for each item. A zero was placed at the midway point and distances between zero and the marked response were then measured and recorded. Marks to the left of the zero were negatively scored and those to the right were positively scored. Hence, the greater the mean response the more positive their perception of the target figure. Ten of the items were health-, fitness-, and sport-related, whereas 9 of the items were related to personal attributes and characteristics. The internal consistency for the “fat” figure was .90 and for the “thin” figure was .94. The 2-week test-retest reliability for the “fat” figure was .63 and for the “thin” figure was .64.

A single-item, “How much control does someone have over his or her weight,” was used to assess participants’ view regarding the controllability of weight. Participants rated their belief by selecting a response on a scale from 1 (*no control*) to 4 (*complete control*).

### Procedures

Active informed consent was received from a parent or legal guardian prior to the students giving assent to complete the study. Students completed the questionnaire during physical education classes in the presence of one of the researchers. This researcher was present for all data collection sessions. Prior to participating, the researcher informed all students (in squad lines where they begin class) on the voluntary, anonymous, and confidential nature of the study as well as on its general purpose. The students were told that the purpose of the study was to identify BI attitude differences in youth. Less than 1% of the students ( $n = 6$ ) were excluded from the study due to lack of parental consent or disinterest. Any student who did not have parental consent or did not want to participate in the study was sent with a different teacher to work in the computer lab while the rest of the class answered the questionnaire. For those who read slow or struggled with reading, the researcher or teacher read the questions and responses to them. After the instructions, the researcher distributed the questionnaires and pencils to the approved students to complete. The researcher did emphasize that the students should not write their names on the questionnaires. The questionnaires were returned to the researcher by the end of the class period (approximately 45 minutes) and placed in an envelope for privacy of student responses.

### Data Analysis

Initially, descriptive statistics were examined to better understand the participants’ body mass index (BMI), weight and body satisfaction, and WM behaviors. The participants who indicated that people had “no control” or “a little control” over weight

were grouped together and those who thought people had “a lot of control” or “complete control” were grouped together. Thus, they were categorized into 2 groups: (a) *no or little control* and (b) *a lot of or complete control*. Next, 2 separate repeated measures multivariate analysis of covariance (MANCOVA) were conducted with BMI, gender, and race as covariates, weight controllability beliefs group as an independent variable, and BSAVAS items as dependent variables. A repeated measures MANCOVA was used to analyze fat and thin figure responses on the BSAVAS jointly (ie, fat-thin combination is the repeated measure), because these responses are not independent of one another and are considered to be a correlated factor.<sup>22</sup> Thus, the fat/thin pair was the within-subject factor and gender and perceived weight controllability were the between-subject factors.

### RESULTS

Participants with missing height and/or weight data and missing gender ( $n = 62$ ) were removed from the data set, which left 307 participants in the data analyses. Self-reported height and weights were used to calculate the students’ BMI (mean = 21.55, SD = 4.77). This revealed that the majority (72%) of participants were normal weight for their gender and age. Of the remaining students, 17.9% were considered overweight or obese and 10.1% were considered underweight. On the basis of their self-evaluations of their weight from YRBSS’s<sup>21</sup> weight items and parallel body shape items, only 49.2% thought they were about the right weight, 33.2% thought they were overweight, and 17.7% thought they were underweight. The vast majority of participants indicated being satisfied with their weight (70.7%) and body shape (64.1%). About half of the participants (49.3%) were trying to lose weight, 14.1% were trying to gain weight, and 36.3% were trying to stay the same weight or not trying to do anything about their weight. Exercising more (83.1%) and eating less (47.1%) were the most common WM behaviors; few participants reported fasting (10.3%), taking diet pills (2.6%), or vomiting or taking laxatives (3.3%).

Most participants reported that people have “a lot of control” (38.4%) or “complete control” (34.4%) over their weight. On the other hand, 23.6% indicated that people have “a little control” and 3.6% indicated that people have “no control” over their weight. Obesity was primarily attributed to controllable factors (top 5 factors endorsed as contributing to obesity on the Beliefs about Obesity Scale;<sup>19</sup> rated from 1 *really disagree* to 4 *really agree*). Participants believed that children who are fat have weight problems because (a) they eat too many calories (mean = 3.02, SD = 0.92), (b) their parents let them eat junk food (mean = 2.89, SD = 1.00), (c) they are lazy (mean =

2.83, SD = 1.06), (d) they have access to junk food machines (mean = 2.75, SD = 1.04), and (e) they lack self-control (mean = 2.62, SD = 1.01).

Results of a MANCOVA, which included all BSAVAS health status items as dependent variables, indicated a significant multivariate interaction for fat-thin health status items and weight controllability beliefs group (Wilks' lambda = .93,  $F(10, 256) = 1.97$ ,  $p = .037$ ,  $\eta^2 = .071$ ). A follow-up univariate test indicated significant effects for both "likes physical activity" ( $p = .001$ ) and "is coordinated" ( $p = .020$ ). Those who endorsed weight controllability beliefs, as compared to those who did not, were more likely to perceive that the fat figure would not enjoy physical activity, and conversely, they believed that the thin figure would enjoy physical activity (Table 1). They were also more likely to perceive that the fat figure would not be physically coordinated and that the thin figure would be physically coordinated.

Although the results of a MANCOVA, which included only the social relationship items as dependent variables, did not show a multivariate interaction between social relationship and weight controllability beliefs, there was a significant effect for fat-thin social relationship (Wilks' lambda = .91,  $F(9, 265) = 3.026$ ,  $p = .002$ ,  $\eta^2 = .093$ ). Follow-up univariate test indicated significant effects for number of friends ( $p = .005$ ), relationship with parents ( $p = .002$ ), happy with looks ( $p = .002$ ), good grades ( $p = .002$ ), relationship

with teachers ( $p = .007$ ), and confidence ( $p = .002$ ). In all cases, the thin figures were viewed more positively than the fat figures (Table 2).

A MANCOVA with BMI, gender, and race as covariates, weight controllability beliefs group as an independent variable, and weight and body shape satisfaction as dependent variables indicated a significant multivariate effect (Wilks' lambda = .97,  $F(2, 294) = 4.32$ ,  $p = .014$ ,  $\eta^2 = .029$ ). Follow-up univariate test indicated significant effects for both weight ( $p = .007$ ) and body shape ( $p = .011$ ) satisfaction. Participants who endorsed weight controllability beliefs had higher levels of satisfaction with weight (mean = 2.92, SD = 0.96) and body shape (mean = 2.99, SD = 0.85) than participants who felt that weight was not controllable (weight satisfaction mean = 2.63, SD = 1.00; body shape satisfaction mean = 2.74, SD = 0.98).

A MANCOVA with BMI, gender, and race as covariates, weight controllability beliefs group as an independent variable, and PASB items as dependent variables indicated a significant multivariate effect (Wilks' lambda = .946,  $F(6, 280) = 2.68$ ,  $p = .015$ ,  $\eta^2 = .05$ ). Follow-up univariate analyses indicated significant effects for vigorous physical activity ( $p < .001$ ). Participants who endorsed weight controllability beliefs engaged in vigorous physical activity more days per week (mean = 4.49, SD = 2.00) than participants who did not endorse weight controllability beliefs (mean = 3.43, SD = 2.20).

Table 1. Descriptive Statistics for the Thin and Fat Figures on Physical, Health, and Fitness Attributes\*

Items	Figure	No or Limited Control		A Lot or Complete Control	
		(n = 70)		(n = 200)	
		Mean	SD	Mean	SD
Physical strength	Thin	13.60	23.68	13.85	24.45
	Fat	-3.51	26.21	-7.81	27.61
General health	Thin	19.07	22.41	23.27	21.41
	Fat	-12.00	25.31	-14.77	25.08
Sports participation	Thin	21.49	20.33	21.59	23.38
	Fat	-11.89	26.39	-15.96	24.61
Fitness level	Thin	22.74	22.30	22.59	22.74
	Fat	-12.57	29.00	-21.25	23.41
Sports ability	Thin	18.10	22.95	21.21	22.10
	Fat	-7.24	25.21	-14.53	25.83
Flexibility	Thin	21.07	25.28	22.93	22.77
	Fat	-20.80	24.55	-22.48	22.42
Physical activity	Thin	14.11	26.65	23.12	21.55
	Fat	-4.97	27.05	-15.46	25.94
Running distance	Thin	15.21	28.00	22.30	22.67
	Fat	-21.46	24.86	-22.31	25.06
Fruits and vegetables	Thin	15.93	24.34	15.19	23.40
	Fat	-2.63	29.59	-11.27	26.81
Coordination	Thin	14.27	22.54	20.36	21.35
	Fat	-7.34	22.41	-13.80	22.83

\*The greater the mean response the more positive the perception is of the target figure.

Table 2. Descriptive Statistics for the Thin and Fat Figures on Personal and Social Characteristics\*

Items	Figure	No or Limited Control		A Lot or Complete Control	
		(n = 73)		(n = 205)	
		Mean	SD	Mean	SD
Friendships	Thin	19.04	21.01	19.24	22.83
	Fat	-3.38	22.35	-5.53	25.88
Parent relations	Thin	25.79	22.97	24.30	23.17
	Fat	16.48	27.48	16.51	27.37
Personal looks	Thin	22.73	22.76	23.37	23.48
	Fat	-16.49	26.13	-15.51	27.78
Academic grades	Thin	7.99	23.59	12.50	21.91
	Fat	11.86	22.98	11.77	21.29
Relation with teacher	Thin	11.82	22.21	12.62	24.12
	Fat	10.37	21.69	8.82	23.54
Confidence	Thin	20.11	23.65	21.49	23.67
	Fat	-3.40	29.43	-12.77	26.81
Academic trouble	Thin	0.11	26.56	-3.30	25.14
	Fat	-4.08	23.82	-7.94	25.24
School involvement	Thin	17.89	24.07	19.40	23.24
	Fat	-3.15	27.13	-8.31	26.46
Weight change	Thin	1.90	23.86	-2.53	24.66
	Fat	31.10	24.08	24.44	25.36

\*The greater the mean response the more positive the perception is of the target figure.

## DISCUSSION

In this study, we examined the associations between adolescents' weight controllability beliefs and their perceptions of personal and social characteristics and physical, health, and fitness characteristics of peers of varying body shapes. We also assessed if and how adolescents' weight controllability beliefs and weight biases are associated with BI and physical activity behavior. Our findings indicated some interesting contradictions in the adolescents' personal weight and body perceptions. For example, although the majority of participants were classified as being within a normal BMI range and indicated that they were satisfied with their body weight and shape, about half reported wanting to lose weight and about one third classified themselves as overweight or obese. The ubiquitous pressure to have a socially ideal body,<sup>23-25</sup> particularly for girls, may play a role in adolescents' perceptions and judgments of their own bodies. Moreover, those who endorsed weight controllability beliefs were more likely to be satisfied with their own weight and body shape. Weight controllability beliefs may contribute to adolescents' feelings of satisfaction with their bodies because of internalized notions that they have control over their body shape and weight, which may be associated with perceived abilities to attain their ideal body resulting in actions toward that goal through dieting, exercising, or some other means.

As seen in previous reports regarding weight and body shape status,<sup>26,27</sup> the health-related characteristics and the personal and social characteristics were typically viewed more positively for the thin target figures than for the fat target figures. Specifically, all of the health-related characteristics associated with the thin target figures were viewed in the positive direction, whereas all of the health-related characteristics associated with the fat target figures were viewed in the negative direction. These results are consistent with social perceptions that a thin body is a healthy body, whereas a fat body is an unhealthy body.<sup>28,29</sup> Among the personal and social characteristics evaluated, participants viewed the thin target figures more positively than the fat target figures. In particular, the thin target figures were viewed more positively for number of friends, relationships with parents, personal looks, confidence levels, and school involvement. Thus, not only are thin peers judged to be healthy but they are also thought to be more socially and personally competent.<sup>30,31</sup>

As an extension of previous research examining weight perceptions, we explored the role of weight controllability beliefs in adolescents' evaluation of thin and fat peers, as well as in adolescents' own physical activity behaviors. In line with previous research,<sup>14</sup> most of the adolescents in our sample (73%) endorsed weight controllability beliefs, believing that individuals had a lot or complete control of their weight. Further, those who endorsed weight controllability beliefs had different perceptions about the thin and fat target

figures regarding physical activity and competence. Specifically, they were more likely to perceive that the thin figure would enjoy physical activity and be coordinated and that the fat figure would not enjoy physical activity and not be coordinated. Although not widely examined, these findings are consistent with previous work.<sup>14,16</sup> Adolescents who perceive that weight is personally controllable may make negative judgments of fat peers' enjoyment of physical activity and ability, because they assume that if a fat peer enjoyed being active and was competent, then he/she would be thin.

A unique finding of this study was the association between weight controllability beliefs and the personal weight-related attitudes and physical activity of participants. Higher weight controllability beliefs were associated with higher levels of body and weight satisfaction and higher levels of vigorous physical activity. It may be that those who perceived their weight as within their control see physical activity as a WM strategy.<sup>18</sup> Indeed, exercise was the most popular method of WM cited by the adolescents in this study. These results are somewhat paradoxical. On the one hand, feeling that individuals have some level of control over their own weight seems to be associated with physical activity, which is good for their health and well-being; on the other hand, there is evidence that body and weight dissatisfaction, also associated with weight controllability beliefs, can have negative psychological consequences and contribute to disordered eating and WM. Future research will need to tease out these complex relationships.

### Limitations

The findings of this study which are derived from a representative sample of adolescents in Texas cannot be generalized to other adolescent populations in other states. Another potential limitation of this study is that self-reported weight and height information was used to calculate BMI status. Although self-reports of height and weight have been found to be highly correlated with actual measures,<sup>32</sup> some researchers have suggested that using this data from adolescent populations, especially girls, may be somewhat problematic because a few among this group may have underestimated weight and overestimated height<sup>33</sup> and underreported food intake and overreported physical activity levels.<sup>34</sup> Likewise, although the reliability and validity of sections of this instrument have been examined, future research needs to determine the entire instruments utility. Moreover, because of the correlational nature of this study, additional research examining the quality of the associations between weight controllability beliefs and health judgments of others is needed to determine if weight controllability beliefs lead to negative perceptions of others or if negative perceptions of peers lead to

increased beliefs that weight is controllable. Determining the nature and direction of this relationship may be useful for the development of educational interventions geared toward reducing weight stigma and prejudice.

### IMPLICATIONS FOR SCHOOL HEALTH

The perceived controllability of weight may be an important construct to study further, particularly in relationship to personal health- and weight-related attitudes and behaviors. Weight loss is directly linked to beliefs regarding personal control over weight, problems with losing weight, medical problems as a factor of weight gain, family problems, and the willingness of family members to diet.<sup>35</sup> Therefore, the research that examines how beliefs and attitudes influence weight gain and loss is necessary for the development of school-based health interventions and treatments.

National and state health, physical education, recreation, and dance professionals, the Centers for Disease Control and Prevention, the American Heart Association, and many other associations have been very critical about the rising obesity rates of children, especially boys.<sup>36,37</sup> Obesity has grown from 5% to 18% in 12- to 19-year-olds in the United States from 2000 to 2008<sup>38,39</sup> and males, aged 6 to 19 years, have continued to increase their weight levels above already historic highs.<sup>36</sup> These messages are creating even more awareness in middle school children, as seen in the results of this study. The data from this study show that middle school children are concerned about weight and exercise, but continue to get bigger and exercise less. Unfortunately, adolescents often believe that overweight children are unhealthy and that thin children are healthy; and believe children who are fat are that way because of "easily" controllable factors such as parents allowing them to eat junk food and access junk food machines in schools.

The findings of this study also provide support for the promotion of physical activity for students of all shapes and sizes. Health and physical education teachers and school administrators need to be aware of the social stereotyping of overweight and obese youth, which is often common within health and physical activity settings, and strategically create physical and psychosocial environments that are supportive and encouraging. Health and physical education classes may be ideal educational settings for teachers to discuss (a) physical activity in a positive manner, (b) factors that contribute to weight and healthy approaches for WM, (c) common weight and body stereotypes, and (d) the idea that healthy bodies can come in a variety of sizes and shapes.

## Human Subjects Approval Statement

This study was approved by the University of North Texas Institutional Review Board and the Fort Worth Independent School District.

## REFERENCES

1. Lobstein T, Baur L, Uauy R. Obesity in children and young people: a crisis in public health. *Obes Rev.* 2004;5:4-85.
2. Freedman DS, Khan LK, Dietz WH, et al. Relationship of childhood obesity to coronary heart disease risk factors in adulthood: the Bogalusa Heart Study. *Pediatrics.* 2001;108:712-718.
3. Stern M., Mazzeo SE, Porter J, et al. Self-esteem, teasing and quality of life: African American adolescent girls participating in a family based pediatric overweight intervention. *J Clin Psychol Med Settings.* 2006;13:217-228.
4. Fulkerson JA, Strauss J, Neumark-Sztainer D, et al. Correlates of psychosocial well-being among overweight adolescents: the role of the family. *J Consult Clin Psychol.* 2007;75: 181-186.
5. Ruhm C. Current and future prevalence of obesity and severe obesity in the United States. *Forum Health Econ Policy.* 2007;10:1-26.
6. Puhl RM, Brownell KD. Bias, discrimination, and obesity. *Obes Res.* 2001;9:788-805.
7. Puhl RM, Brownell KD. Psychosocial origins of obesity stigma: toward changing a powerful and pervasive bias. *Obes Rev.* 2003;4:213-227.
8. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol Bull.* 2007;133:557-580.
9. Crosnoe R, Frank K, Strassmann-Mueller A. Gender, body size and social relations in American high schools. *Social Forces.* 2008;86:1189-1216.
10. Zeller M, Reiter-Purtill J, Ramey C. Negative peer perceptions of obese children in the classroom environment. *Obesity.* 2008;16:755-762.
11. Greenleaf C, Chambliss H, Rhea DJ., et al. Weight stereotypes and behavioral intentions toward thin and fat peers among White and Hispanic adolescents. *J Adolesc Health.* 2006;39: 546-552.
12. Eisenberg M, Neumark-Sztainer D, Story M. Associations of weight-based teasing and emotional well-being among adolescents. *Arch Pediatr Adolesc Med.* 2003;157:733-738.
13. Crandall CS. Prejudice against fat people: ideology and self-interest. *J Pers Soc Psychol.* 1994;66:882-894.
14. Tiggemann M, Anesbury T. Negative stereotyping of obesity in children: the role of controllability beliefs. *J Appl Soc Psychol.* 2000;30:1977-1993.
15. Iobst E, Ritchey P, Nabors L, et al. Children's acceptance of a peer who is overweight: relations among gender, age and blame for weight status. *Inter J Obes.* 2009;33:736-742.
16. Musher-Eizenman DR, Holub SC, Miller AB, et al. Body size stigmatization in preschool children: the role of control attributions. *J Pediatr Psychol.* 2004;29:613-620.
17. Vartanian L, Herman C. Beliefs about the determinants of body weight predict dieting and exercise behavior. *Eating Behav.* 2005;7:176-179.
18. Boutelle KN, Libbey H, Neumark-Sztainer D, Story M. Weight control strategies of overweight adolescents who successfully loss weight. *J Am Diet Assoc.* 2009;109:2029-2035.
19. Price JH, Desmond S, Ruppert E. Elementary physical education teachers' perceptions of childhood obesity. *Health Educ.* 1990;21:26-32.
20. Hill A, Silver E. Fat, friendless and unhealthy: 9-year old children's perception of body shape stereotypes. *Inter J Obes.* 1995;19:423-430.
21. Grunbaum J, Kann L, Kinchen S, et al. Youth risk behavior surveillance—United States, 2001. *Surveill Summ.* 2002;51 (SS04):1-64.
22. Schutz RW, Gessaroli ME. The analysis of repeated measures designs involving multiple dependent measures. *Res Q Exerc Sport.* 1987;58:132-149.
23. McCabe MP, Ricciardelli LA. A prospective study of pressures from parents, peers, and the media on extreme weight change behaviors among adolescent boys and girls. *Behav Res Ther.* 2005;43:653-668.
24. Mack DE, Strong HA, Kowalski KC, et al. Does friendship matter? An examination of social physique anxiety in adolescence. *J Appl Soc Psychol.* 2005;37:1248-1264.
25. Mackey ER, LaGreca AM. Does this make me look fat? Peer crowd and peer contributions to adolescent girls' weight control behaviors. *J Youth Adolesc.* 2008;37:1097-1110.
26. Latner JD, Simmonds MB, Rosewall J, et al. Assessment of obesity stigmatization in children and adolescents: modernizing a standard measure. *Obesity.* 2007;15:3078-3085.
27. Latner JD, Stunkard AJ. Getting worse: the stigmatization of obese children. *Obes Res.* 2003;11:452-456.
28. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity.* 2009;17:940-964.
29. Smith C, Schmoll K, Konik J, et al. Carrying weight for the world: influence of descriptors on judgments of large-sized women. *J Appl Soc Psychol.* 2007;37:989-1006.
30. Bell SK, Morgan SB. Children's attitudes and behavioral intentions toward a peer presented as obese: does a medical explanation for the obesity make a difference? *J Pediatr Psychol.* 2000;25:137-145.
31. Kraig KA, Keel PK. Weight-based stigmatization in children. *Inter J Obes.* 2001;25:1661-1666.
32. Spencer EA, Appleby PN, Davey GK, Key TJ. Validity of self-reported height and weight in 4808 EPIC-Oxford participants. *Pub Health Nutr.* 2002;5:561-565.
33. Farre Rovira R, Frasquet Pons I, Martinez Martinez MI, Roma Sanchez R. Self-reported versus measured height, weight and body mass index in Spanish Mediterranean teenagers: effects of gender, age and weight on perceptual measures of body image. *Ann Nutr Metab.* 2002;46:68-72.
34. Rennie KL, Jebb SA, Wright A, Coward WA. Secular trends in underreporting in young people. *Br J Nutr.* 2005;93:241-247.
35. Uzark K, Becker M, Dielman T, et al. Perceptions held by obese children and their parents: implications for weight control intervention. *Health Educ Behav.* 1988;15:185-198.
36. Ogden CL, Carroll MD, Curtin LR, Lamb MM, Flegal KM. Prevalence of high body mass index in US children and adolescents, 2007-2008. *JAMA.* 2010;303:242-249.
37. Centers for Disease Control and Prevention. Overweight and obesity: data and statistics. Retrieved from: <http://www.cdc.gov/obesity/data/index.html>. 2009. Accessed December 7, 2009.
38. Ogden CL, Carroll MD, Flegal KM. High body mass index for age among US children and adolescents, 2003-2006. *JAMA.* 2008;299:2401-2405.
39. Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999-2004. *JAMA.* 2006;295:1549-1555.