

Stigma, Obesity, and the Health of the Nation's Children

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Preventing childhood obesity has become a top priority in efforts to improve our nation's public health. Although much research is needed to address this health crisis, it is important to approach childhood obesity with an understanding of the social stigma that obese youths face, which is pervasive and can have serious consequences for emotional and physical health. This report reviews existing research on weight stigma in children and adolescents, with attention to the nature and extent of weight bias toward obese youths and to the primary sources of stigma in their lives, including peers, educators, and parents. The authors also examine the literature on psychosocial and physical health consequences of childhood obesity to illustrate the role that weight stigma may play in mediating negative health outcomes. The authors then review stigma-reduction efforts that have been tested to improve attitudes toward obese children, and they highlight complex questions about the role of weight bias in childhood obesity prevention. With these literatures assembled, areas of research are outlined to guide efforts on weight stigma in youths, with an emphasis on the importance of studying the effect of weight stigma on physical health outcomes and identifying effective interventions to improve attitudes.

Keywords: stigmatization, stereotype, obesity, children, adolescents

The epidemic of obesity in youths is spreading at alarming rates. The percentage of youths who are at risk for becoming overweight continues to increase (Eaton et al., 2006), and by 2010, it is expected that the number of overweight children will increase significantly worldwide, with almost 50% of children in North America and 38% of children in the European Union becoming overweight (Y. Wang & Lobstein, 2006). This dramatic trend of increasing childhood obesity will have substantial long-term consequences for public health and economics (Raymond, Leeder, & Greenberg, 2006; Tucker, Palmer, Valentine, Roze, & Ray, 2006; Wyatt, Winters, & Dubbert, 2006; Yach, Stuckler, & Brownell, 2006). There is also considerable reason to be concerned about the vulnerability of so many children to the negative social and emotional consequences of obesity. These consequences may have immediate and potentially lasting effects on their well-being in addition to adverse medical outcomes.

Social marginalization and stigmatization of obesity in adults have been extensively documented, with evidence that overweight and obese individuals face social disadvantages in multiple domains of living, including employment, education, healthcare, and interpersonal relationships (Brownell, Puhl, Schwartz, & Rudd, 2005; Puhl & Brownell, 2001). There is also a growing literature demonstrating that overweight and obese children and adolescents are targets of societal stigmatization. Research suggests that overweight and obese youths are victims of bias and stereotyping by

peers (Brylinsky & Moore, 1994; Kraig & Keel, 2001; Latner & Stunkard, 2003; Neumark-Sztainer et al., 2002; Neumark-Sztainer, Story, & Faibisch, 1998), educators (Bauer, Yang, & Austin, 2004; Canning & Mayer, 1966; Neumark-Sztainer, Story, & Harris, 1999), and even parents (Adams, Hicken, & Salehi, 1988; Crandall, 1991, 1995; Davison & Birch, 2004). This is particularly concerning during childhood and adolescence when the formation of social relationships is salient; children may be especially vulnerable and sensitive to weight stigmatization and its consequences. These experiences could hinder their social, emotional, and academic development and could exacerbate adverse medical outcomes that they already face, such as impaired glucose tolerance, insulin resistance, hypertension, dyslipidemia, and long-term consequences for cardiovascular and liver morbidity (Daniels, 2006; Weiss & Caprio, 2005). Thus, as attention continues to focus on ways to reduce childhood obesity, it is equally critical to understand the nature of weight stigma and its effects on youths.

This article reviews existing literature on weight stigma in children and adolescents, with attention to the assessment, nature, and extent of weight bias toward youths and the primary sources of stigma in their lives. Given the accumulation of research that has focused on the psychosocial and physical health consequences of childhood obesity, we also examine the role of weight stigma and whether it may be mediating negative health outcomes. We then review stigma-reduction efforts that have been tested to improve attitudes toward obese children and highlight complex questions about the role of weight bias in childhood obesity prevention. With these literatures assembled, we outline areas of research to guide efforts to better understand weight stigma in youths and ways to reduce bias. Studies were located for this review with comprehensive computer-based literature searches of psychological, medical, social science, and educational databases (such as PsycINFO, PubMed, MEDLINE, ERIC), as well as from references located throughout the articles themselves and from searches of published

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articles and chapters in edited volumes and books. We excluded unpublished dissertations from this review.

A stigmatized child possesses an attribute or characteristic that is linked to a devalued social identity (Crocker, Major, & Steele, 1998; Goffman, 1963) and is ascribed stereotypes or other deviant labels that increase vulnerability to status loss, unfair treatment, prejudice, and discrimination (Link & Phelan, 2001). When referring to weight stigma in this article, we are referring to negative weight-related attitudes and beliefs that are manifested by stereotypes, bias, rejection, and prejudice toward children and adolescents because they are overweight or obese. Stigma encountered by overweight and obese youths can include verbal teasing (e.g., name calling, derogatory remarks, being made fun of), physical bullying (e.g., hitting, kicking, pushing, shoving), and relational victimization (e.g., social exclusion, being ignored or avoided, the target of rumors). Thus, stigma can emerge in subtle forms, and it can be expressed overtly.

Children are typically described as being “at risk for overweight” if their body mass index (BMI) is within the range of 85th–94.99th percentile (adjusted for sex and age), and “overweight” if their BMI is at the 95th percentile or higher (Kuczmarski et al., 2002; Mei et al., 2002; Ogden et al., 2006). Although BMI categories of weight are important for identifying health risks among children, it is not clear from existing research to what extent BMI cutoffs are meaningful for understanding weight stigma in youths. Some work has examined the relationship between degree of obesity and exposure to stigma among children, which we will examine in this review. However, because of the limited data in this area and because studies on this topic do not universally distinguish between *overweight* or *obese* or use additional descriptors to describe weight (e.g., *fat* or *heavy*), we use the terms *obesity* and *overweight* interchangeably to describe the condition of excess weight. The following section examines the different research designs used to investigate weight stigma and the conceptual issues that need to be considered in interpreting each of these designs.

Research Designs and the Assessment of Weight Stigma

Determining Attitudes About Obesity

Survey methods. Different studies have used diverse measures to study attitudes toward obese children. A common method is collecting information about stereotypes or negative attitudes through questionnaires. These questionnaires have often asked respondents to either evaluate (e.g., N. Goodman, Dornbusch, Richardson, & Hastorf, 1963; Maddox, Back, & Liederman, 1968; S. A. Richardson, Goodman, Hastorf, & Dornbusch, 1961; S. A. Richardson & Royce, 1968) or assign adjectives to (e.g., Kraig & Keel, 2001; Lerner & Gellert, 1969; Staffieri, 1967, 1972) a set of figures with different physical features, including obesity. Assessing weight bias toward children among adult respondents allows a greater level of complexity in questionnaires, such as the detailed measurement of beliefs about overweight children (e.g., Neumark-Sztainer et al., 1999) or measures of implicit attitudes (e.g., O'Brien, Hunter, & Banks, in press) that may overcome some concerns about social desirability in adults. However, the differences between measures used in many studies make it difficult to draw comparisons between studies.

Experimental methods. Several investigations have used experimental procedures to examine the effect of obesity on stigmatizing attitudes toward youths, with other physical and interpersonal factors held constant. Some innovative experimental research designs have included as their dependent variables children's ratings of peers wearing or not wearing “fat suits” (Bell & Morgan, 2000), children's positioning of thin or overweight cardboard cutouts (Lerner, Karabenick, & Meisels, 1975a), and coded stories about thin or overweight characters that parents created and told to their children (Adams et al., 1988). Experimental research designs have the advantage of permitting inferences of causality.

Determining the Consequences of Weight Stigma

Cross-sectional surveys. The most common design used to study the consequences of weight bias involves examining the association between psychosocial consequences and different forms of weight-related victimization. This research design is able to establish statistically significant relationships between variables. On the basis of correlational findings, it is still not possible to establish causality or temporal relationships (i.e., which variable came first). For example, it may be that experiences of victimization could follow from (rather than lead to) low self-esteem, psychological problems, or other personal characteristics that may possibly “invite” bullying (Rigby, 2003). It is also possible that obesity itself, or factors other than victimization that are associated with obesity, may lead to negative consequences. It is even plausible that a third factor, such as temperament or biological variables, could account for the occurrence of both weight-based victimization and psychological or health problems.

Techniques such as controlling for the degree of obesity and examining the correlates of weight bias across groups of both overweight and nonoverweight children can help clarify whether negative consequences are linked specifically to weight bias. Such analytical procedures can indicate a reduced likelihood that other factors account for the relationship between weight stigma and negative consequences. Correlational studies that have examined only the link between obesity and psychosocial impairment are the least specific in this regard. Studies that examine the link between experiences of weight bias and psychosocial difficulties have permitted more specific conclusions to be drawn. Studies that link weight bias and psychosocial problems that can also control for obesity (or other relevant variables), or that investigate the relationship between bias and psychosocial difficulties across different weight categories, are most capable of determining whether a true association exists. In addition, comparing the psychosocial functioning of overweight children who are victimized with the functioning of those who are not victimized can help to determine whether psychosocial and health outcomes systematically differ on the basis of weight bias.

Case studies and qualitative reports. Qualitative methods and case studies can generate findings that were previously unknown and unexpected. Thus, the study of individuals' experiences with weight bias can be a useful method for the initial development of hypotheses. For example, open-ended, qualitative approaches have generated interesting hypotheses concerning the relative effects of weight bias and racial prejudice on adolescent girls (Neumark-Sztainer et al., 1998) and concerning relatively unexplored potential sources of weight bias, such as healthcare providers (Edmunds,

2005). Dramatic case studies, such as that of Gina Score, a 14-year-old overweight girl who died following forced physical exertion and amidst taunting by drill instructors at a juvenile detention camp (Puhl & Brownell, 2001), can bring the issue of weight bias to the public's attention and stimulate research and public action. These studies cannot establish either correlational or causal relationships, especially as most negative and psychological and health consequences are multiply determined.

Retrospective studies. This research design can determine the temporal sequence of variables related to weight bias. Establishing temporal sequence cannot confirm causality, as behaviors are multiply determined, but it can rule out the possibility that later behaviors caused earlier ones. If weight-related teasing or comments in childhood preceded eating disturbances in adulthood (e.g., Fairburn et al., 1998), it is plausible that the teasing may have contributed to the development of eating disturbances. However, a major problem with assessing these hypothesized relationships retrospectively in adulthood is the likelihood that participants' recollection is systematically influenced by their current level of functioning. Individuals with greater psychosocial problems in adulthood may be more likely to recall being stigmatized as children, even if they were not actually more stigmatized at the time.

Prospective longitudinal studies. Prospective studies, examining putative risk factors such as weight-related teasing in childhood and assessing the development of psychosocial problems over time, address many of the problems of cross-sectional and retrospective research. They can establish temporal sequence and are not subject to problems with potentially biased recollection. Short of experimental research exposing certain children to repeated weight bias (which would clearly be unethical), longitudinal research helps clarify causal relationships between variables. For example, recent prospective data showing that bullying follows the development of overweight status in children (Griffiths, Wolke, Page, & Horwood, 2006) may help to rule out certain alternative hypotheses to explain cross-sectional research linking obesity to victimization (e.g., that victimization leads to obesity). Of course, the conclusions of a research study are limited by the measures the study includes. Although several prospective studies have examined obesity as a predictor of psychosocial problems, few have included weight bias as a possible mediator of this effect. Notable exceptions have found that experiences of weight bias may mediate the relationship between overweight and psychological difficulties (Cattarin & Thompson, 1994; Davison & Birch, 2002) and that weight bias may predict difficulties even when controlling for other variables (Haines, Neumark-Sztainer, Eisenberg, & Hannan, 2006).

Nature and Extent of Weight Stigma in Youths

Weight-based stigmatization toward overweight children has been documented in the literature for over 40 years. The majority of research on weight stigma in children has examined biased attitudes, stereotypes, and behavioral intentions, rather than direct forms of discrimination. As highlighted above, weight stigma has been assessed in children and adolescents with a variety of different methods, including experimental laboratory studies, self-reported playmate preferences, ratings of line-drawing silhouettes and target figures, semantic differential ratings of target figures,

peer and friendship nominations, qualitative interviews, and adjective attribution tasks that ask children to ascribe a variety of positive and negative characteristics to pictures or photographs of targets with different body sizes (Bell & Morgan, 2000; Counts, Jones, Frame, Jarvie, & Strauss, 1986; Jarvie, Lahey, Graziano, & Framer, 1983; S. A. Richardson et al., 1961; Staffieri, 1967; Tiggemann & Wilson-Barrett, 1998; Wardle, Volz, & Golding, 1995). However, for studying stigma among very young children, additional approaches have been implemented such as storytelling methods that involve describing stimuli in the context of a story and then asking children to identify pictures of children with various body sizes who represent the characters that were narrated to them (Cramer & Steinwert, 1998).

One of the first classic studies in this area was conducted in 1961, by Richardson and colleagues, who instructed 640 school children ages 10–11 years old to view six pictures of children and rank them in order of whom they would most prefer to be friends with (S. A. Richardson et al., 1961). Four of the pictures depicted children with various disabilities such as a child in a wheelchair, on crutches, with an amputated hand, and with a facial disfigurement; one picture depicted an overweight child; and another showed an average-weight child with no disabilities. The overweight child was ranked last of the six pictures and was rated as being least likeable.

Other studies from this time period using similar assessment methods of attitudes among adults and children paralleled this finding and showed that bias toward overweight and obese children were apparent across a range of samples, including adults who worked with disabled children and elderly persons (N. Goodman et al., 1963; Maddox et al., 1968; S. A. Richardson & Royce, 1968).

Since the publication of these studies, the prevalence of obesity in children has increased dramatically (Ogden et al., 2006), and a recent replication of the S. A. Richardson et al. (1961) study suggested that weight stigma toward children also worsened during this time. Latner and Stunkard (2003) used the same pictures from the original 1961 study and asked 458 children (in Grades 5 and 6) to rank order each picture according to the child's likeability. The overweight child was again ranked to be the least liked and was also ranked lower than was the overweight child in 1961. Furthermore, the distance between the average rankings of the highest and lowest ranked pictures had increased by over 40% since the 1961 study.

Existing studies on weight stigma suggest that this is indeed a common experience for overweight and obese youths. However, determining specific prevalence rates of bias is difficult because different types of stigmatizing encounters and biased attitudes have been examined in the literature with a variety of assessment methods. For example, Neumark-Sztainer and colleagues (2002) examined the prevalence of weight-based teasing among middle and high school students ($N = 4,746$) and found that 30% of girls and 24% of boys reported weight-based teasing from peers. However, among students with the highest BMI (at or above the 95th percentile), prevalence rates of teasing jumped to 63% of girls and 58% of boys. More recent prospective research assessing 8,210 children documented that 36% of obese boys and 34% of obese girls reported being victims of weight-based teasing and various forms of bullying (Griffiths et al., 2006). Qualitative work using in-depth interviews with 50 overweight female adolescents dem-

onstrated that 96% of girls reported being targets of different types of weight bias, including hurtful comments, social rejection, and differential treatment due to their weight (Neumark-Sztainer et al., 1998). Prevalence rates may also be different when parents are the sources of teasing compared with when the sources are peers (Eisenberg, Neumark-Sztainer, & Story, 2003; Neumark-Sztainer et al., 2002). These few studies highlight the complexities of determining the prevalence of weight bias in children, indicating the importance of examining potential differences in perceived weight stigma across variables like sex, weight, age, and ethnicity. These variables are discussed below.

Sex Differences

Research has documented mixed findings regarding whether male adolescents and female adolescents express different levels of weight bias and whether one sex is more vulnerable to stigma than is the other. Some studies assessing attitudes of children have demonstrated consistent stereotyping of obese targets in both girls and boys, with no differences in attitudes between girls and boys (Cramer & Steinwert, 1998; Hill & Silver, 1995; Tiggemann & Anesbury, 2000; Tiggemann & Wilson-Barrett, 1998; Wardle et al., 1995).

Other work has challenged this conclusion, as S. A. Richardson et al. (1961) found that although both boys and girls rated an obese peer negatively, girls reported disliking the obese peers more than boys did. By using attitude ratings of line-drawing silhouettes, Kraig and Keel (2001) found distinct sex differences in ratings across weight categories in a sample of 34 children. Girls rated both overweight and average-weight targets more negatively than they rated a thin child, but among boys, overweight targets were rated more negatively than were average-weight and thin targets. Thus, for girls the salient category was thinness, and for boys it was overweight, suggesting that ideals of thinness are so prevalent for girls that even being average weight is undesirable.

Additional research suggests that sex differences may exist in vulnerability to weight stigma in youths. Some work has demonstrated that in children as young as 4 years old overweight girls were ascribed more negative characteristics than were boys (Turnbull, Heaslip, & McLeod, 2000), and larger scale studies have indicated that weight-based teasing and victimization among overweight adolescents are reported by more girls than boys (Eisenberg et al., 2003; Neumark-Sztainer et al., 2002). However, other work has found no sex differences in vulnerability to weight-based stigmatization (Kraig & Keel, 2001). It may be that sex differences in weight-based victimization are more related to the type, rather than amount, of stigma. For instance, a study of 416 adolescents found that obese boys reported more overt forms of weight-based victimization, such as teasing and bullying, and obese girls reported more relational forms of victimization, such as exclusionary and hurtful treatment, than did average-weight peers (Pearce, Boergers, & Prinstein, 2002). Longitudinal work is needed to examine girls' and boys' experiences of weight stigma throughout childhood and transitions into adolescence.

Age

Several studies have demonstrated that weight bias begins early in childhood and becomes worse as children get older. Biased

attitudes toward overweight peers have been demonstrated in preschool children as young as age 3, and by age 4 children can identify a target's excess body weight as the reason for their attitudes (Cramer & Steinwert, 1998). Stigmatizing attitudes appear to increase throughout preschool years (Cramer & Steinwert, 1998) and from age 4 through age 11 (Wardle et al., 1995). Among boys, research has documented increases in negative stereotypes about obese peers in Grades 2, 4, and 6 (Lawson, 1980) and across ages of 4–5, 14–15, and 19–20 years (Lerner & Korn, 1972). Other studies suggest that that bias establishes in children during early elementary school grades (Brylinsky & Moore, 1994; Sigelman, Miller, & Whitworth, 1986). In contrast, some work has not found an effect of age on negative stereotyping among children (Tiggemann & Wilson-Barrett, 1998).

It is possible that over time, attitudes among youths may become more tolerant of obesity in adulthood. In one study, older adolescents rated larger sized figures as more acceptable compared with elementary school children (Rand & Wright, 2000). Recent work also demonstrated that college students ranked drawings of overweight peers more favorably than did elementary school-age children (Latner, Stunkard, & Wilson, 2005). Some have suggested that the initial increase in biased attitudes during childhood may coincide with awareness and internalization of cultural norms about weight, followed by a leveling off of negative attitudes and potential decrease during adulthood (Latner & Schwartz, 2005). The cross-sectional nature of existing studies limits the ability to determine the degree that anti-fat attitudes change throughout childhood and adolescence and to determine what reasons there are for potential developmental shifts. Additional prospective research is needed to address these questions.

Race/Ethnicity

Few studies have examined whether children with different ethnic and cultural backgrounds are more or less likely to endorse biased attitudes or have increased vulnerability to weight stigmatization. Some work suggests that ethnic and cultural differences may exist in expressions of weight bias among youths. In a recent replication of S. A. Richardson et al.'s (1961) early work with a sample of 356 college students, African American female students demonstrated more positive attitudes toward obese peers than did African American male students or Caucasian female and male students (Latner et al., 2005). A cross-cultural examination comparing weight stigma among 450 Japanese and American children showed that 5th-grade Japanese students expressed more positive attitudes toward an obese target than did their American peers (Crystal, Watanabe, & Chen, 2000). However, by the 11th-grade, Japanese students held more negative attitudes toward obesity, similar to American students of the same age.

Lerner and colleagues conducted a series of studies that examined proximal behavior in response to obese stimulus figures (Iwawaki, Lerner, & Chihara, 1977; Lerner, 1973; Lerner, Karabenick, & Meisels, 1975a, 1975b). American and Japanese children (kindergarten through 6th grade) were instructed to place a cardboard figure (representing themselves) along a calibrated board at a comfortable distance from silhouettes varying in body size. The authors then measured the personal space between the figures. Results showed that children placed themselves at a greater distance from the heaviest silhouette compared with that

from the thinner silhouettes, and these findings held across gender, age, and culture. The projective nature of this measure and the reliance on certain levels of cognitive abilities in children are clear limitations, but more studies using behavioral measurement of attitudes are needed.

A recent investigation examined weight bias among Caucasian ($n = 111$) and Hispanic ($n = 157$) middle school students and found that regardless of participants' ethnicity or gender, overweight peers were stigmatized (Greenleaf, Chambliss, Rhea, Martin, & Morrow, 2006). In addition, students with strong weight-based stereotypes reported less willingness to engage in social, academic, or recreational activities with overweight peers compared with thin peers. These behavioral intentions were unaffected by ethnicity.

The influence of ethnicity on children's vulnerability to weight stigma is unclear. One study assessed weight-based victimization among 117 African American 5–10 year olds and reported that body weight was positively related to peer teasing and that weight-based victimization was the only significant contributor predicting low self-esteem among a range of other psychosocial variables (Young-Hyman, Schlundt, Herman-Wenderoth, & Bozylinski, 2003). Furthermore, 40% of obese children and 48% of very obese children (defined by BMI z scores that were more than 5 standard deviations above gender- and age-specific means) reported fighting with other children because of their weight. Qualitative research with 50 female adolescents showed that African American students reported being stigmatized because of their race and weight (Neumark-Sztainer et al., 1998). Of those girls who reported both forms of bias, they stated that weight-based stigma was experienced as more personal and hurtful than was racial bias. Although there was no difference in the amount of perceived exposure to weight stigma among African American and Caucasian adolescents, African Americans reported being stigmatized by strangers more than did Caucasians.

Other work examining victimization in overweight youths found ethnic differences among boys, of which overweight Native American and Asian American boys were more likely to be teased about their weight by family members than were Caucasian boys (Brylinsky & Moore, 1994). A study in Mexico of 403 girls and boys ages 12–17 years (Castellon, Bacardi-Gascon, & Jimenez-Cruz, 2004) used methods similar to previous studies asking respondents to rank drawings of 6 peers in order of liking (Latner & Stunkard, 2003; S. A. Richardson et al., 1961). Obesity was less stigmatized among Mexican children than among children in the United States: Mean rankings of the obese figure were 3.53 in Castellon et al. (2004) and 4.97 in Latner and Stunkard (2003). Additional research in Mexico showed no differences in liking of an obese child between Indian and non-Indian children. The obese child was liked the least by both groups (Leon-Reyes, Bacardi-Gascón, & Jimenez-Cruz, 2006).

Other work has found no effect of ethnicity on attitudes toward obesity in children. S. A. Richardson and Royce (1968) replicated S. A. Richardson et al.'s classic (1961) study (described above) but added a second stimulus set of pictures depicting African American children in addition to the Caucasian children who were depicted in the original line drawings. Participants' rankings were unaffected by skin color, showing that the obese child was again ranked last, regardless of skin color, and across racial groups of participants.

A limitation of most existing studies is the overrepresentation of Caucasian youths in samples compared with smaller proportions of children and adolescents from different ethnic backgrounds. In general, the lack of research examining the relationship between ethnicity and weight stigma in children makes it difficult to conclude whether meaningful differences exist. To clarify ethnic differences in the stigmatization of obesity, stratified sampling methods are needed to compare the influence of ethnicity across sex, age, and various weight categories.

Body Weight

As more children become overweight, it is critical to determine whether children at higher levels of obesity experience more frequent or severe forms of weight stigmatization than do children at lesser degrees of overweight and to learn how their own body weight influences their attitudes about obesity. Research on weight-based victimization suggests that vulnerability to weight bias may be greater among children at the higher levels of obesity. A recent longitudinal study of weight-based teasing in 8,210 youths identified potential pathways for obesity and victimization and found that weight category significantly predicted future victimization (Griffiths et al., 2006). Specifically, obese boys and girls (over the 95th percentile) were more likely to be victims of overt bullying 1 year later, but this was not the case for overweight girls and boys (between the 85th and 95th percentile). These findings support other research documenting that obese adolescents report more overt victimization than do overweight adolescents (Pearce et al., 2002). A study of 10–14 year olds ($N = 156$) found that weight-based teasing was more severe, frequent, and upsetting among overweight children compared with nonoverweight children (Hayden-Wade et al., 2005). In addition, the degree of teasing was positively related to weight concerns, loneliness, lower confidence in physical appearance, and higher preference for isolative activities, independent of the sex and weight status of children. The preference for active and social activities was lowest among children who were heaviest and reported a high degree of teasing.

In addition, a Canadian study examined 5,749 youths ages 11–16 years, illustrating that overweight and obese adolescents in all age groups (with the exception of 15–16-year-old boys) were more likely to be victims of bullying behaviors than were average-weight peers (Janssen, Craig, Boyce, & Pickett, 2004). With increasing BMI, there was a greater likelihood of verbal, physical, and relational peer victimization. Among 15–16-year-old boys, BMI was also positively associated with being the perpetrator of bullying behaviors compared with BMI among average-weight peers. Among girls of the same age group, there was an increased likelihood of both being victimized and being a perpetrator of bullying. Similarly, a British study of 2,127 middle school students showed that being overweight was positively related to victimization and that becoming obese between ages 11 and 15 years was preceded by higher victimization and lower self-esteem (Sweeting, Wright, & Minnis, 2005).

A number of studies have reported that overweight and obese children are just as likely to endorse negative attitudes and stereotypes about obesity as average-weight children across a range of ages. Among 113 preschool children, Cramer and Steinwert (1998) found that negative stereotypes persisted regardless of children's

own body weight and that on some assessment tasks overweight preschoolers actually demonstrated stronger stereotypes than did nonoverweight peers. A study of children ages 7–9 years reported that BMI did not affect negative ratings of overweight targets with line drawings of silhouettes (Kraig & Keel, 2001), and other research with 9-year-old girls found no relationship between body weight and negative stereotypes, despite the fact that one-third of girls were overweight and 14% were obese (Davison & Birch, 2004). These findings parallel results of other studies (Counts et al., 1986; Tiggemann & Anesbury, 2000) and are similar to findings among adults that show overweight and obese persons are just as likely to endorse stigmatizing attitudes as are nonoverweight persons (Latner et al., 2005; Schwartz, Vartanian, Nosek, & Brownell, 2006; S. S. Wang, Brownell, & Wadden, 2004).

This body of work suggests that overweight and obese children may be internalizing societal stigma and negative stereotypes. Unlike many other social groups that are stigmatized and display positive “in-group” preferences (Tajfel & Turner, 1986), overweight and obese children may find little support or protection from their overweight peers who may also hold negative attitudes and further perpetuate stigma. More work is needed to better understand how weight stigma is internalized by children; the degree that stigmatizing messages from parents, peers, and the media increase likelihood of internalization; and whether (and to what degree) internalization increases vulnerability to adverse consequences such as low self-esteem, poorer emotional adjustment, and unhealthy eating behaviors and weight loss practices.

Attributions About Causality of Obesity

Attribution of causality has been suggested as an important variable in the formation of attitudes toward obesity for several decades (Jarvie et al., 1983), and this appears to be consistent in attitudes among children and adolescents. For instance, experimental work demonstrated that female adolescents ($N = 168$) evaluated an overweight peer more positively when the target’s excess weight could be attributed to a thyroid condition compared with that of a condition in which an external cause was not provided for being overweight. The latter condition resulted in negative evaluations of the target having poor self-discipline and being self-indulgent (DeJong, 1993). In a related experiment, female adolescents ascribed more positive ratings to an obese peer viewed in a video if they were informed that the target’s excess weight was the result of a thyroid glandular disorder compared with ratings of an obese target whose obesity was not explained and who was subsequently evaluated as less disciplined, more self-indulgent, and less popular (DeJong, 1980). However, no significant differences emerged in the degree of likeability for each target.

These findings parallel experimental research with younger children. A study of preschool children ($N = 168$) found that those who believed that weight was within personal control expressed more negative attitudes toward obese targets (Musher-Eizenman, Holub, Miller, Goldstein, & Edwards-Leeper, 2004). This is the first study to demonstrate that attributions about control and causality are related to negative stereotyping of overweight targets in such young children. A study of elementary school children ($N = 99$) showed that they were less likely to blame an obese peer for being heavy if they were provided with information suggesting the

target had little responsibility for her obesity, although this information did not change their liking of the peer (Sigelman, 1991). Similar work demonstrated that students in Grades 3–6 ($N = 184$) attributed less blame to an obese child whose weight was attributed to external (e.g., medical) causes. However, provision of this causal information had little effect on overall attitudes, especially among older children (Bell & Morgan, 2000). In contrast, a study of 96 children in Grades 4–6 found that children largely believed that obesity is under personal control, and the extent of perceived controllability was positively correlated with the degree of negative stereotyping. Attitudes were more positive in children who assigned less personal responsibility for obesity (Tiggemann & Anesbury, 2000). However, in this study perceived controllability was not experimentally manipulated, making it difficult to determine whether changing controllability beliefs actually enhances liking of obese targets because these two correlated components of stigmatization were not tested separately.

Taken together, these studies suggest that attributions about the causes of obesity may play a role in expressions of weight bias toward youths. It is important to consider how attributions of responsibility affect attitudes among overweight and obese children themselves. Given that many stereotypes about obese individuals emphasize views that body weight is within personal control (e.g., stereotypes that people are obese because they lack self-discipline and willpower, or because they are lazy, unmotivated, or self-indulgent; Puhl & Brownell, 2003), it is plausible that internalization of stigma by obese children influences their attributions about the causality of obesity, which may in turn have negative implications for their emotional well-being. For example, in a clinical sample ($N = 67$) of overweight children (ages 9–11 years), lower self-esteem was demonstrated specifically among those children who believed that they were responsible for their excess weight compared with those children who provided external attributions for their weight (Pierce & Wardle, 1997). In addition, even though 94% of these overweight children believed that weight-based stereotypes made about them by peers were unfair and untrue, 90% reported that they believed that teasing would stop if they could lose weight. This supports the broader literature that links low self-esteem to attributing negative events to internal causes (Crocker, Cornwell, & Major, 1993). Future research needs to examine how attributions about causality of obesity are formed in children, where they learn messages about causes of obesity (e.g., media, parents, peers, educators), the degree that such attributions influence their endorsement of specific weight-based stereotypes, and whether modification of causality beliefs can lead to meaningful and sustained improvements in attitudes.

Interpersonal Sources of Weight Stigma

Children and adolescents who are overweight and obese are vulnerable to stigma and bias from multiple sources. Although it is not surprising that peers frequently endorse negative attitudes toward obese youths, there is a growing literature documenting that educators and parents also express weight bias toward children.

Peers

Accumulating literature consistently shows that overweight and obese children are particularly vulnerable to weight bias from their peers. Several studies have demonstrated that negative attitudes toward overweight and obese peers begin as early as age 3. In one study of 113 preschool children, using four different methods to assess stigmatizing attitudes (a story task, an adjective attribution task, assessment of playmate preferences, and personal body attitudes), weight stigma was present by age 3 (Cramer & Steinwert, 1998). Specifically, 3–5 year olds were significantly more likely to ascribe negative characteristics to overweight targets (including mean, stupid, ugly, and sloppy) compared with nonoverweight targets, and children overwhelmingly preferred the thin target for a playmate compared with the overweight target. A similar study demonstrated that children as young as age 3 ascribed targets portrayed as “chubby” with negative characteristics such as mean, stupid, loud, ugly, lazy, sad, and lacking in friends (Brylinsky & Moore, 1994).

Among elementary school children, these trends continue and, in some cases, worsen. Children ages 4–11 years ($N = 180$) ascribed multiple negative attributes to obese targets, including being ugly, selfish, lazy, stupid, and lying, getting teased, and having few friends (Wardle et al., 1995). Additional studies assessing weight bias in this age group have reported similar findings. By using adjective checklist methods with line-drawing silhouettes, 7–12 year olds described overweight figures as more lazy, less popular, less happy, and less attractive (Tiggemann & Wilson-Barrett, 1998); 6–11 year olds ascribed negative characteristics to overweight targets such as lazy, sloppy, dirty, cheats, lies, argues, mean, and stupid (Staffieri, 1967, 1972); and 7–9 year olds assigned more negative ratings (such as poorer social functioning and academic success) to overweight targets than to thinner targets (Hill & Silver, 1995; Kraig & Keel, 2001). By using photographs of obese and average-weight peers who were described as potential partners to play a game with, students in Grades 3–5 perceived the obese target to be a worse game partner and a poorer leader, and the obese target was ascribed fewer positive attributes than was the average-weight target (Counts et al., 1986). A variation of the adjective checklist method with videos of child actors wearing a fat suit or no suit also demonstrated that children in Grades 3–6 assigned more negative characteristics to the obese target (Bell & Morgan, 2000).

Among adolescents, weight stigma continues with many of the same negative attributions in addition to new stereotypes. In a qualitative study of 50 overweight adolescent girls in high school, participants reported that peers commonly stereotyped them as being lazy, unclean, eating too much, unable to perform certain physical activities (e.g., dancing), not having feelings, and unable to “get a boyfriend” (Neumark-Sztainer et al., 1998). Similar findings have emerged in studies with college-age students, who rated obese individuals as lazy, self-indulgent, less attractive, having lower self-esteem, less likely to be dating, sexually unskilled, and deserving of heavier and less attractive partners (Harris, 1990; Regan, 1996; Tiggemann & Rothblum, 1988).

Of noted importance is that research on weight stigma by peers has emerged in several countries outside of North America, including Britain, Australia, and Japan (Crystal et al., 2000; Tiggemann & Anesbury, 2000; Tiggemann & Wilson-Barrett, 1998;

Turnbull et al., 2000). These studies paralleled the above findings that negative attitudes develop in preschool years (Turnbull et al., 2000), that elementary school children ascribe more negative evaluations to obese peers than to thinner targets on a variety of characteristics ranging from laziness and lack of hard work to lower preferences for friends (Tiggemann & Anesbury, 2000; Tiggemann & Wilson-Barrett, 1998), and that negative attitudes persist in adolescence and may become worse as children get older (Crystal et al., 2000).

Educators

Over a decade ago, the National Education Association (1994) issued a report on size discrimination concluding that the school setting is a venue for ongoing ostracism, stigmatization, and discrimination for overweight and obese youths from nursery school through college. Given the common occurrence of weight stigmatization from peers, it is not surprising that many of these encounters occur in the school setting where children spend most of their time. What is unexpected, however, is that some research points to teachers and educators as additional sources of weight bias toward children. Although teachers and other school staff members are invested in the well-being of their students, they are not immune to societal attitudes that stigmatize obese individuals, and they may perpetuate bias unintentionally or through differential treatment of overweight students.

In a study examining attitudes toward obesity among 115 middle and high school teachers, one-fifth of respondents reported beliefs that obese persons are untidy, less likely to succeed than are thinner persons, more emotional, and more likely to have family problems (Neumark-Sztainer et al., 1999). Many teachers did not associate obesity with common stereotypes, but over half believed that obesity is often caused by a form of compensation for lack of love or attention, and 43% strongly agreed that *most people feel uncomfortable when they associate with obese people*. In a study examining beliefs about obesity among 227 elementary school principals, over 50% cited lack of self-control and psychological problems as major contributors to obesity, and although they agreed that obesity placed children at risk for peer rejection and that schools need to do more to alleviate childhood obesity, 25% also stated that they believed that teachers at their school would not be supportive of implementing school-based treatment programs to help obese children (Price, Desmond, & Stelzer, 1987).

A recent study demonstrated strong implicit anti-fat attitudes among 180 students training to become physical educators, who expressed significantly worse attitudes compared with a matched sample of non-physical education (PE) students (O'Brien et al., in press). In addition, on explicit attitude measures, PE students believed more strongly that obese individuals lack willpower. Furthermore, PE students who were near the end of their training (which included formal training on the causes of obesity) expressed stronger weight bias than did those who were beginning their training, suggesting a socialization of prejudice over time. These findings support other work that found that PE teachers ($N = 105$) perceived overweight children to have poorer social, reasoning, physical, and cooperation skills than average-weight children have (Greenleaf & Weiller, 2005). In addition, physical educators reported higher expectations for “normal-weight” than for overweight students across a range of performance and ability

areas. The implications of these findings are concerning, especially given the importance of encouraging overweight and obese children to participate in PE and activity.

Perceptions of students suggest that they are aware of teachers' attitudes and that these could have negative health implications. Bauer and colleagues (2004) conducted focus groups and interviews with overweight middle school students, who reported occasionally receiving negative comments from teachers about their athletic abilities that led them to feel upset and avoid participating in PE classes. In addition, overweight students reported being teased by peers (often during the lunch period at school), and despite school policies prohibiting teasing and harassment, they felt school rules were not enforced (Bauer et al., 2004). Questions that clearly need to be studied given the above findings are whether stigma expressed by physical educators leads to reduced participation and/or avoidance of physical activity by overweight youths and whether existing school-based policies that prohibit victimization are being implemented effectively.

One study has challenged findings of existing work, documenting favorable attitudes among schoolteachers ($N = 258$) toward obese children (Hague & White, 2005). However, participants in this study reflected a self-selected sample of educators who chose to participate in a Web-based course on the topic of obesity and weight stigma, suggesting that they may have been more sensitive to issues of bias. When negative attitudes were observed, they were more likely to occur among male educators than among female educators and among individuals with less professional training.

As teenagers enter college, bias from educators may appear in new forms. In a study examining school records and college applications of 1,165 high school students, obese students were significantly less likely to be accepted to college despite equivalent application rates and academic performance to nonobese peers (Canning & Mayer, 1966). This was especially apparent for obese female students, who were accepted less frequently than were male students. Data were obtained from high school records with students' SAT scores, height and weight listed in health records, parental occupation and education, and students' height and weight records taken at the beginning of the freshman year of college. Legal cases have also emerged in which obese college students have filed suits against professors and educational institutions for weight-based discrimination, some of which have reached the United States Supreme Court (Weiler & Helms, 1993).

Taken together, the limited data in this area suggest that overweight children may be vulnerable to weight bias at school by teachers and school faculty. To date, studies have relied on self-report methods to assess bias and have often focused on school-based implementation of obesity prevention programs rather than on addressing specific attitudes or bias (Price, Desmond, & Ruppert, 1990; Price, Desmond, Ruppert, & Stelzer, 1987). It is also possible that negative beliefs on the part of educators could result from accurate impressions of overweight students they have encountered. For example, educators may have observed actual impairments in academic performance (e.g., Datar, Sturm, & Mag-nabosco, 2004), levels of emotional disturbance (e.g., Eremis et al., 2004), or social difficulties (R. S. Strauss & Pollack, 2003). Although they may be accurate, the perception of these problems and resulting stereotypes and expectancies might play a role in perpetuating psychosocial challenges among overweight children

and adolescents. Clearly, more work is needed to understand the prevalence and severity of stigmatizing attitudes among educators and how this influences emotional, physical, and academic outcomes of students. It will be important to implement multiple assessment methods to achieve these goals, including interviews and ratings by both students and teachers, observational measures of assessing bias, and methods to investigate differential treatment of overweight and obese students in the classroom and in larger institutional admissions procedures.

Parents

Perhaps the most surprising source of weight stigma toward youths is parents. Although limited work has examined parental bias, consistent and discouraging findings have emerged with different methodologies. Davison and Birch (2004) examined stereotypes about obesity among 9-year-old girls and their parents ($N = 178$), both of whom ascribed significantly more negative characteristics (e.g., laziness) to obese persons than to thinner persons. Fathers with higher education and income were more likely to endorse stereotypes, as were both parents who reported a strong investment in their own appearance. Girls were more likely to display negative stereotypes if their parents emphasized the importance of a thin body shape and weight loss. Parents who were overweight (60% of mothers and 82% of fathers) and obese (28% of mothers and 31% of fathers) were just as likely to endorse negative stereotypes as thinner parents.

Experimental work addressing parental weight bias has demonstrated that parental verbal communication patterns with children may transmit negative stereotypes about obese children (Adams et al., 1988). In this study of 86 children and their parents, parents were provided with three pictures of children (one average-weight child, one obese child, and one handicapped child) and were asked to tell a story about each picture to their own child. Out of the three pictures, parents portrayed the obese child to have the lowest self-esteem and self-concept and to have been the least likely described as having a successful outcome at the end of the story.

Self-report studies of teasing and stigmatization lend additional insight to parental expressions of stigma. In a population-based sample of adolescents ($N = 4,746$), weight-based teasing by family members was reported by 47% of very overweight girls and 34% of very overweight boys (Neumark-Sztainer et al., 2002). This finding is similar to recent work that retrospectively examined experiences of weight stigmatization and sources of stigma in two samples of overweight and obese adults (Puhl & Brownell, 2006). In the first sample of 2,449 adult women, mothers were reported as perpetrators of weight bias among 44% of respondents, and fathers were reported by 34%. These results were replicated in a second sample of 222 men and women who were matched for age and BMI.

Stigma from parents may have unexpected consequences. In research examining high school seniors (sample sizes ranging from 833 to 3,386 students), several studies demonstrated that overweight girls received less financial support from their parents for college than did average-weight girls, even after controlling for parental income, ethnicity, family size, and education (Crandall, 1991, 1995). Crandall's work proposed that negative attitudes toward obesity stem from ideological beliefs that emphasize Protestant work-ethic values of self-determination, individualism, and

beliefs that outcomes of another person's life are attributable to internal, controllable causes, all of which increase the likelihood that people, including parents, will blame individuals for being overweight (Crandall, 1994; Crandall & Schiffhauer, 1998).

Biased attitudes among parents may in part stem from stigma that parents themselves perceive because their child is overweight or obese. One study of 67 children and their parents showed that parents of overweight children reported that they felt blamed and criticized for their child's excess weight (Pierce & Wardle, 1997). Parents also reported feeling guilt, anger, and frustration because they did not know how to help their child successfully lose weight. Qualitative work has found similar results in which parents described their interactions with healthcare providers after they sought help for their overweight children. Although responses varied considerably, some mothers reported that providers left them feeling blamed and held responsible for their child's overweight status (Edmunds, 2005).

Parents of obese children may feel pressure and negative evaluation by others if their child is having difficulty losing weight. This perceived parental responsibility combined with obstacles encountered in helping their child achieve successful weight loss may create an atmosphere of frustration and anger in the household. It is possible that parents may take out their frustration, anger, and guilt on their overweight child by adopting stigmatizing attitudes and behavior, such as making critical and negative comments toward their child. This hypothesis has not been tested but may be a useful avenue for future research. Clearly, more work is needed to determine how parents communicate stigmatizing messages to their children and what effect this has on their well-being.

Unstudied Sources of Childhood Weight Stigma

Given that obese youths face stigmatization from peers, educators, and even parents, it is likely that other sources of stigma exist that have not yet been studied. For example, with an accumulation of work documenting biased attitudes toward adult obese patients by healthcare professionals (Amy, Aalborg, Lyons, & Keranen, 2006; D. Klein, Najman, Kohrman, & Munro, 1982; Maroney & Golub, 1992; Price, Desmond, Krol, Snyder, & O'Connell, 1987; Schwartz, O'Neal, Brownell, Blair, & Billington, 2003), it is important to determine whether overweight children are also stigmatized by health providers and what implications this may have for their well-being and health outcomes. Other environments where children may be vulnerable to stigma should also be examined. Do junior and high school coaches stigmatize overweight students in athletic activities? Are obese students less likely to get chosen for school activities unrelated to weight such as roles in school plays, bands, or other extracurricular activities? Are camp counselors at summer camps biased against overweight campers? Do obese children face barriers in public venues, such as restaurants, clothing stores, amusement parks, or modes of transportation that do not accommodate large-sized children? For adolescents who seek employment, are overweight teenagers less likely to be hired for part-time jobs than thinner peers? These questions have not been studied, and research documenting whether stigma exists in these areas is needed.

Consequences of Weight Bias for Youths

An accumulating literature has addressed the influence of obesity on psychological, social, and academic outcomes in youths. Although some studies have produced mixed findings, it is evident that obesity increases risk for a range of negative consequences for some children and adolescents. Because this body of literature has recently been empirically reviewed elsewhere (Wardle & Cooke, 2005), we will not provide an exhaustive review of this work here. Rather, we aim to summarize the general findings in these areas and to examine whether, and to what degree, weight stigma may contribute to negative psychosocial, academic, and physical health outcomes for children.

Psychosocial Consequences

Self-esteem. The first comprehensive review of self-esteem and obesity in youths was conducted by French, Story, and Perry (1995), who reviewed 35 studies and concluded that there is a modest relationship between obesity and low self-esteem in children but that self-esteem scores of obese children often fall approximately in the normal range (French et al., 1995). A more recent review by Wardle and Cooke (2005) showed that additional studies conducted in the last decade are primarily consistent with these findings. Specifically, in community and clinical samples of obese youths there was little evidence to suggest that obese children are typically more vulnerable to low self-esteem. However, clinical samples of obese children displayed lower levels of self-esteem than did those of obese or average-weight community control participants.

Prospective studies that have examined the development of low self-esteem and obesity generally show that excess weight in children predicts future low self-esteem (Brown et al., 1998; Davison & Birch, 2001, 2002; Hesketh, Wake, & Waters, 2004; R. S. Strauss, 2000; Tiggemann, 2005). In addition, overweight children whose self-esteem decreases over a 4-year period may be at greater risk of unhealthy behaviors, including smoking and alcohol use, than are overweight children whose self-esteem does not decrease (R. S. Strauss, 2000). It may be that overweight increases vulnerability to specific types of low self-esteem in children, such as lower self-perceptions of physical appearance and athletic competence (Phillips & Hill, 1998) and poorer body esteem and perceived cognitive capacities (Davison & Birch, 2001).

Several stigma-related variables may mediate the relationship between obesity and self-esteem. A prospective study of adolescents demonstrated that weight-based teasing from peers and parental criticism of weight mediated the relationship between overweight and lower self-concept in youths (Davison & Birch, 2002), and research among adolescents found that weight-based teasing was associated with poorer self-esteem among both female and male adolescents (Eisenberg et al., 2003). Other work showed that negative self-perceptions in 5-year-old obese girls were related to fathers' opinions of their daughter's obesity (Davison & Birch, 2001). In a study of 9–11 year olds, obese children who were most vulnerable to low self-esteem were those who believed that they were responsible for being overweight, and more positive self-esteem was seen among overweight children who attributed their weight to external causes beyond their control (Pierce & Wardle,

1997). Clinical samples of obese youths may be at increased risk for low self-esteem if treatment for weight loss implies personal responsibility for their weight or blame for not being able to lose weight (Wardle & Cooke, 2005). Thus, internalization of stigma may have negative implications for self-esteem in obese children. More work is needed to clarify this relationship and to identify whether reducing exposure to stigma will increase self-esteem.

Depression. The nature of the relationship between obesity and depression in children and adolescents has not yet been firmly established. Some studies show increased vulnerability to depression, but effects are often small and measures to assess depressive symptoms and BMI have varied considerably (see review by Wardle & Cooke, 2005). Like self-esteem, research has tended to show that community-based samples of obese children do not differ in levels of depression compared with those of average-weight peers (Brewis, 2003; Eisenberg et al., 2003; Wardle, Williamson, Johnson, & Edwards, 2006) but that clinical samples of obese children display higher levels of depression than those of average-weight control children (Britz et al., 2000; Erermis et al., 2004).

Regarding the causal pathway between depression and obesity in children, several prospective studies of adolescent girls found that obesity did not predict depression at follow-up periods (Stice & Bearman, 2001; Stice, Hayward, Cameron, Killen, & Taylor, 2000), whereas research among boys has demonstrated a modest relationship between chronic obesity since childhood and higher levels of depression over time (Mustillo et al., 2003). Others have reported opposite findings; one study found that childhood depression predicted development of obesity at 1-year follow-up (E. Goodman & Whitaker, 2002), another longitudinal investigation of 1,027 adolescents reported that adolescent depression predicted obesity in adulthood (L. P. Richardson et al., 2003), and a recent community-based cohort study of 820 youths demonstrated that depression in childhood predicted higher weight over time among female youths but not male youths (Anderson, Cohen, Naumova, & Must, 2006).

Some work suggests that stigma in the form of weight-based teasing may mediate the relationship between depression and obesity in youths. Eisenberg and colleagues examined weight-based teasing in 4,746 adolescents and found that weight-based teasing was related to increased likelihood of depression, regardless of sex or ethnicity (Eisenberg et al., 2003). In addition, weight category was not related to most outcomes after teasing was controlled for, suggesting that teasing itself, rather than weight, may be the relevant factor predicting negative emotional well-being. Similarly, a study of middle school girls ($N = 372$) demonstrated that both paternal and maternal appearance-based teasing predicted depression after BMI was controlled for (Keery, Boutelle, van den Berg, & Thompson, 2005). Clearly, more work is needed to determine how bias and stigma influence vulnerability to depression in overweight and obese youths.

Body dissatisfaction. An amassing literature has examined body image among overweight children and adolescents. Two recent reviews of this literature conclude that body dissatisfaction is higher in overweight and obese children than in average-weight peers, and this seems particularly true for overweight girls (Ricciardelli & McCabe, 2001; Wardle & Cooke, 2005). Although very little work has assessed body dissatisfaction in clinical samples of obese youths (Braet, Tanghe, Decaluwe, Moens, & Rosseel, 2004),

there are consistent findings in numerous community-based studies showing greater body dissatisfaction among children and adolescents with a higher BMI (Buddeburg-Fischer, Klaghofer, & Reed, 1999; Davison, Markey, & Birch, 2003; French et al., 1995; Israel & Ivanova, 2002; Pesa, Syre, & Jones, 2000; Renman, Engstrom, Silfverdal, & Aman, 1999; R. S. Strauss & Pollack, 2003). Body dissatisfaction may also have important implications for self-esteem in obese children, as some work has found that low self-esteem reported among overweight adolescent female children was no longer significant after body image is controlled for (Pesa et al., 2000).

Weight stigma may be particularly influential in the development of poor body image among obese youths. Thompson, Covert, Richards, Johnson, and Cattarin (1995) found that history of weight-based teasing was significantly related to the development of poor body image and eating disturbances in female adolescents ($N = 379$) and that actual body weight did not affect body image—rather, this effect was mediated by teasing history (Thompson et al., 1995). In another study of overweight adolescents, weight teasing was related to body dissatisfaction among boys and girls, regardless of ethnicity and weight category (Eisenberg et al., 2003). Other work suggests that appearance-based teasing from parents and siblings is a significant predictor of body dissatisfaction among middle school girls ($N = 372$), even after BMI is controlled for (Keery et al., 2005).

Body dissatisfaction that results from weight teasing may in turn lead to other negative outcomes. One prospective study of 10–15-year-old girls ($N = 87$) found that level of obesity predicted weight-based teasing, which in turn predicted body dissatisfaction and led to unhealthy eating behaviors over a 3-year period (Cattarin & Thompson, 1994). A retrospective study of adults also reported that the more frequently children were teased about their weight during childhood, the greater level of body dissatisfaction they had as adults, which was in turn correlated with lower self-esteem (Grilo, Wilfley, Brownell, & Rodin, 1994).

Cross-cultural work has paralleled these findings. In a study of 96 adolescent girls from India, teasing mediated the effect of BMI on body dissatisfaction, and teasing also predicted restrictive eating behaviors (Shroff & Thompson, 2004). Among 634 female adolescents from Sweden and Australia, weight-based teasing mediated the relationship between BMI and body dissatisfaction (Lunner et al., 2000). Another study of 470 Australian adolescent girls showed that those with the highest BMI were most likely to be teased, which in turn directly influenced body dissatisfaction (Van den Berg, Wertheim, Thompson, & Paxton, 2002). This study mirrors previous findings that body dissatisfaction was predicted more strongly by weight-related teasing experiences than by actual body weight and provides additional support that teasing directly influences body dissatisfaction, which in turn directly affects eating disturbances (Thompson et al., 1995).

Taken together, this research suggests that teasing may be a risk factor for the development of body dissatisfaction in overweight and obese children and adolescents. More work is needed to determine whether certain types of weight-based teasing, such as overt, relational, or physical forms of victimization, differentially influence body image in youths and to identify the impact of these experiences for children and adolescents of different ages and ethnic backgrounds.

Interpersonal relationships. One reason that adolescence is a particularly sensitive time for experiences of weight stigma is that the formation of social relationships is especially salient during this period. The literature in this area suggests that negative attitudes about obesity by peers may adversely influence social relationships for overweight children. Research with elementary school children has documented that obese children are liked less and rejected more often by peers than are average-weight students (C. C. Strauss, Smith, Frame, & Forehand, 1985). This finding emerged first in the literature almost 40 years ago with the use of peer-nomination methods with elementary school boys, for which overweight boys were the least likely to be nominated as close friends by their peers (Staffieri, 1967). Although one study found no differences among overweight and nonoverweight 9-year-old girls in popularity ratings from peers (Phillips & Hill, 1998), more recent work challenges this finding. For instance, in a large-scale investigation of social peer networks among more than 90,118 adolescents (ages 13–18 years) from the National Longitudinal Study of Adolescent Health, overweight adolescents were more likely to be socially isolated and were less likely to be nominated by their peers as friends than were average-weight students (R. S. Strauss & Pollack, 2003). As BMI increased in students, they received fewer friendship nominations. Another study of 9,943 adolescents reported that obese students were less likely to spend time with friends than were thinner peers (Falkner et al., 2001). After controlling for grade level, race, and socioeconomic status (SES), obese girls were less likely to interact with friends than were nonobese peers, and obese boys were less likely to spend time with friends and more likely to report that they felt their friends did not care about them than were nonobese boys.

Dating relationships may also be affected by weight bias in adolescence. Obese adolescents are less likely to have ever dated and are more dissatisfied with their dating status compared with average-weight peers (Pearce et al., 2002). Another study showed that only 12% of adolescents had dated someone who was overweight, and nonoverweight adolescents expressed that they were uncomfortable dating an overweight person (Sobal, Nicolopoulos, & Lee, 1995). Of those who dated, female adolescents were more likely to have dated an overweight partner than were male adolescents.

It appears that overweight children know that their weight is the reason for social rejection. In a study of 9–11 year olds, overweight children reported that they believed that their excess weight impedes their social interactions with peers, and 69% believed that if they lost weight they would have more friends (Pierce & Wardle, 1997). Overweight adolescents have also reported having expectations of rejection and social isolation (Monello & Mayer, 1963). Some research suggests that weight bias is not only directed at obese persons but it also stigmatizes individuals who are perceived to be in a social relationship with an obese individual (Hebl & Mannix, 2003). This notion of the “spread of stigmatization” needs to be further examined to determine whether peers and friends of obese children attempt to avoid negative evaluations by distancing themselves from obese peers.

Suicidal behaviors. One of the most alarming consequences of obesity in youths may be the increased risk of suicidal behaviors. Several large population-based studies have demonstrated that obese adolescents are more likely to endorse suicidal ideation and attempts than are average-weight peers (Ackard, Neumark-

Sztainer, Story, & Perry, 2003; Eaton, Lowry, Brener, Galuska, & Crosby, 2005; Falkner et al., 2001). For instance, in their study of 9,943 adolescents, Falkner and colleagues demonstrated that obese girls were 1.7 times more likely to report a suicide attempt in the previous year than were thinner peers, even after controlling for grade level, race, and SES (Falkner et al., 2001). In addition, research has demonstrated that BMI and self-perceptions of being slightly or very overweight were positively associated with suicidal ideation among Caucasian, Hispanic, and Black students, and that among Caucasian students, perceiving oneself to be very overweight was associated with greater suicide attempts (Eaton et al., 2005).

Perhaps not surprisingly, weight-based teasing and victimization are emerging as risk factors for suicidal ideation and attempts among overweight adolescents. In their investigation of examined weight-based teasing in over 4,000 adolescents, Eisenberg et al. (2003) found that teasing was related to suicidal ideation and attempts for both girls and boys, and those who were teased about their weight were 2–3 times more likely to report suicidal ideation than were adolescents who were not teased. Similarly, Neumark-Sztainer et al. (2002) found that 51% of girls who were victims of weight-based teasing from peers and family members had thought about committing suicide compared with 25% of those who had not been teased. Among boys, 13% who were teased by family members about their weight reported attempting suicide compared with 4% who were not teased. Although more work is needed to better understand the extent that stigma and teasing increase vulnerability to suicidal behaviors in overweight and obese youths, the current findings are sobering. They indicate the critical importance of studying the impact of stigmatizing experiences on emotional well-being in this population.

The findings above describe a range of adverse psychosocial outcomes for obese youths that may be exacerbated by weight bias. It is also important to consider that the totality of negative psychosocial consequences may significantly impair their overall quality of life (QOL). One study of obese youths ($N = 106$) displayed significantly lower health-related QOL compared with nonobese children on multiple domains, including physical health, psychosocial health, emotional and social well-being, and school functioning (Schwimmer, Burwinkle, & Varni, 2003). An alarming finding of this research was that obese children had QOL scores comparable with those of children with cancer. In a related study examining parental reports of QOL pertaining to their own children (ages 8–11 years), it was found that overweight children had poorer psychosocial health outcomes—lower scores on self-esteem, emotional well-being, physical functioning, and overall general health—compared with those of average-weight children (Friedlander, Larkin, Rosen, Palermo, & Redline, 2003). Self-reported QOL was inversely related to BMI among 642 overweight 11–19 year olds from community and clinical settings (Kolotkin et al., 2006). Whether weight stigma specifically contributed to QOL in these instances was not addressed and clearly requires research attention.

SES and Academic Consequences

Adolescent obesity may interfere with economic success later in life. The degree of overweight among 16-year-old girls in the United Kingdom was inversely correlated with their earnings at

age 23 years, regardless of whether they were still overweight. This effect occurred even when parental social class and the girls' academic test scores were controlled for (Sargent & Blanchflower, 1994). In this prospective investigation of 12,537 respondents, the girls in the top 10% of the BMI range earned 7.4% less income, 7 years later, than did nonoverweight girls. Another study demonstrated that overweight 16–24-year-old male and female participants ($n = 10,039$) had lower household incomes 7 years later, controlling for socioeconomic origins and academic test scores (Gortmaker, Must, Perrin, Sobol, & Dietz, 1993). These differences were not due to health problems: Persons with chronic physical health conditions did not have lower socioeconomic attainment than did nonoverweight participants. Thus, although not specifically assessed, weight bias could have contributed to SES disadvantages (Gortmaker et al., 1993).

One hypothesis for the relationship between SES and BMI is that obese adolescents may have impaired cognitive and academic abilities that lead to lower economic attainment. Research on possible differences in cognitive and academic abilities has yielded mixed findings. An investigation of 6–13-year-old children in China reported lower IQ scores in severely obese children relative to average-weight control children (Li, 1995), but no differences between moderately obese children and control children. In Thailand, a study of 2,252 students found a lower grade point average in overweight youths in 7th–9th grades but found no differences in academic performance in younger children in the 3rd–6th grades (Mo-suwan, Lebel, Puetpaiboon, & Junjana, 1999).

In the United States, a study of over 11,000 children found that in kindergarten and at the end of 1st grade, overweight children had lower math and reading test scores (Datar et al., 2004). However, these differences were no longer significant when the comparison controlled for SES and other background variables (e.g., mother's education and ethnicity). Datar and colleagues (2004) suggested that obesity may be only a marker, but not a cause, of poor academic achievement. However, other research showed even when race, parental SES, and grade were controlled for, obese girls in the 7th, 9th, and 11th grades were more likely than were average-weight girls to report having been held back a year in school (Falkner et al., 2001).

Alternatively, the relationship between weight and academic performance could work the other way—academic problems may lead to obesity. A 10-year Danish prospective study of 987 3rd graders showed that learning difficulties, below-average scholastic proficiency, and special education needs increased the risk of obesity at ages 20–21 years (Lissau & Sorensen, 1993). It is possible that neither obesity nor cognitive abilities vary as a function of the other variable but that they both co-vary as a result from a third unknown factor, such as genetics. It may also be that this broader independent variable accounts for a cluster of risk factors in addition to obesity and academic achievement. For example, Australian 14 year olds with low cognitive function and from low income families were more likely to exhibit a cluster of cardiovascular risk factors: smoking, overweight, and high television viewing (Lawlor et al., 2005).

Regardless of these mixed findings, it will be important to examine perceptions of professionals who work with obese children and whether their beliefs about academic achievement and obesity could in turn form attributions that fuel weight-based stigmatization. For example, perceived lower academic achieve-

ment among some obese children may contribute to stigmatizing beliefs of teachers, nurses, and social workers (e.g., Neumark-Sztainer et al., 1999) and could help explain the phenomenon that overweight 5-year-old girls have lower perceived cognitive ability than do their nonoverweight peers (Davison & Birch, 2001). Negative attitudes about one's own academic abilities may also afflict obese adolescents. Compared with their average-weight counterparts, obese girls and boys are more likely to consider themselves below-average students, obese girls are less likely to expect themselves to finish college, and obese boys are more likely to expect themselves to quit school (Falkner et al., 2001).

Thus, an important avenue for research is to determine whether obese children and adolescents' academic progress may be impaired by their weight or by bias in academic settings. For example, it needs to be tested whether their lower rates of admission to high-ranking colleges (Canning & Mayer, 1966) and their lower financial support from parents (Crandall, 1991) affect obese adolescents' academic achievement or completion of a college degree. Sargent and Blanchflower (1994) found that young men and women who had been obese at age 16 had significantly fewer years of education compared with that of nonobese peers. Whether, and to what degree, weight bias affects scholastic achievement, academic self-efficacy, and future SES for obese youths is a complex question, but it clearly warrants additional research attention.

Physical Health Consequences

Eating behaviors and physical activity. Overweight adolescents are more likely than nonoverweight youths to engage in disordered eating behaviors such as binge eating and chronic dieting (Neumark-Sztainer et al., 1997). Compared with nonoverweight girls, overweight girls are more than twice as likely to report vomiting and unhealthy use of diet pills or laxatives (Boutelle, Neumark-Sztainer, Story, & Resnick, 2002). Are these eating disturbances related to weight bias? Weight-based teasing has been associated with disturbances in eating. Overweight adolescent girls and boys who experienced frequent weight-related teasing engaged in unhealthy weight control and binge eating behaviors more often than did overweight girls and boys who were not teased about their weight (Neumark-Sztainer et al., 2002). The relationship between weight teasing and disordered eating remained when controlling for BMI and SES, and it was found across the total sample (including the nonoverweight youths). This suggests that the eating disturbances are not a function of children's weight but of others' reactions to these children. Similarly, recent prospective research on weight-based victimization assessed 2,516 adolescents, demonstrating that 23% of female adolescents and 21% of male adolescents were targets of weight-based teasing and that teasing predicted binge eating at 5 years of follow-up among both male and female adolescents, even after age, race/ethnicity, and SES were controlled for (Haines et al., 2006). Sex differences also emerged, of which weight teasing predicted unhealthy weight control behaviors in boys and frequent dieting in girls.

Weight-related teasing may also be associated with other forms of disturbed eating. The frequency and impact of weight-related teasing (how upsetting it was) were correlated with eating disturbance (as measured by the Drive for Thinness scale on the Eating Disorders Inventory; Garner, Olmstead, & Polivy, 1983) in 121 girls ages 10–15 years (Fabian & Thompson, 1989). Similar

results were found in a later series of studies (Thompson et al., 1995) demonstrating that weight-related teasing history had a directional effect on eating disturbances (the Drive for Thinness scale and the Eating Attitudes Test-26; Garner, Olmstead, Bohr, & Garfinkel, 1982). Weight teasing history was a unique predictor of drive for thinness, even when assessed alongside other predictors: frequency of appearance comparison and internalization of societal values of thinness (Stormer & Thompson, 1996). In a Finnish study of nearly 9,000 adolescents (14–16 years old), girls who had been bullied at school at least weekly were over twice as likely, and bullied boys were 10 times as likely, to meet criteria for bulimia (Kaltiala-Heino, Rissanen, Rimpela, & Rantanen, 1999). Adolescents with bulimia also had a higher BMI than did those without bulimia, though the correlation between weight and bullying was not examined in this investigation. In retrospective studies, childhood weight-related teasing, appearance-related teasing and discrimination, and negative comments by family members about weight, shape, or eating while growing up have been associated with the development of frequent binge eating and bulimia nervosa later in life (Fairburn et al., 1998; Fairburn, Welch, Doll, Davies, & O'Connor, 1997; Jackson, Grilo, & Masheb, 2000; Striegel-Moore, Dohm, Pike, Wilfley, & Fairburn, 2002).

In 13–20-year-old girls with type 1 diabetes mellitus (DM), eating behavior is especially relevant to health and well-being. However, both negative comments about weight by family members and disordered eating behavior, especially binge eating, are high in these girls compared with girls without DM. Sixty percent of girls with DM (mean BMI = 23.9) received negative and hurtful comments about their weight and eating from their parents, relative to 33% of girls without DM (mean BMI = 23.6; Mellin, Neumark-Sztainer, Patterson, & Sockalosky, 2004). The authors suggested that these negative comments may increase the risk for disordered eating, which was similarly prevalent in girls with DM: 60% reported binge eating compared with 0% reported by girls without DM. However, this study did not directly test the association between binge eating and negative comments.

Thompson and colleagues (1995) have suggested that the possible effect on disturbed eating of negative verbal commentary and teasing may be mediated by its effect on body dissatisfaction. However, weight bias may also affect eating behavior by increasing stress, a widely discussed antecedent to overeating in certain obese individuals, particularly in restrained eaters (Greeno & Wing, 1994). Although little research has been conducted on stress and eating disturbances in children, a recent study of 4th–6th-grade students found perceived stress to be associated with unhealthy eating behaviors and with the use of eating as a coping strategy (Jenkins, Rew, & Sternglanz, 2005). This relationship was especially strong in Hispanic and African American children. Adolescent girls with eating disorders have reported a greater number of stressful life events, but group differences existed only when life events related to eating disorders were included (Sharpe, Ryst, Hinshaw, & Steiner, 1997). These findings were from cross-sectional research studies. However, a prospective study of 143 adolescent girls suggested that weight-reducing efforts seem to predict and may cause higher stress levels in the future (Rosen, Tacy, & Howell, 1990). Findings with adults suggest a relationship between stress and binge eating (Gluck, 2006) and between stress and eating disturbances more generally (Bennett & Cooper, 1999).

It is possible that in addition to the psychological effects of stigmatization discussed above, weight bias may engender greater levels of general stress, in response to which unhealthy eating may be a common, albeit misguided, coping strategy. Unfortunately, this response may partly help to perpetuate the original reasons for the stigma by contributing to the maintenance of higher weight.

Weight-based victimization may also have negative consequences for physical activity levels in overweight youths. Recent work demonstrated that peer victimization toward overweight youths ($N = 92$) was negatively related to physical activity, for which depressive symptoms and loneliness mediated the relationship between teasing and physical activity (Storch et al., 2006). The authors suggested that overweight youths may attempt to avoid physical activities if victimization frequently occurs. This parallels other research with 576 middle school students documenting that weight criticism during physical activities was related to negative attitudes toward sports and lower levels of physical activity (Faith, Leone, Ayers, Moonseong, & Pietrobelli, 2002) and with reports of overweight middle school students that negative comments by teachers about their athletic abilities lead to avoidance of PE classes (Bauer et al., 2004).

Cardiovascular health. An area that has received very little attention but has potential importance for the well-being of obese children is whether weight stigma may negatively influence cardiovascular health outcomes. A recent study by Matthews, Salomon, Kenyon, and Zhou (2005) tested whether perceptions of unfair treatment due to physical appearance were related to elevated ambulatory blood pressure among 217 Black and White adolescents (Matthews et al., 2005). On separate testing occasions, it was found that adolescents who reported unfair treatment because of their weight and physical appearance had elevated ambulatory blood pressure, even after typical determinants of blood pressure, including BMI, sex, race, physical activity, posture, consumption, and mood, were controlled for. Reports of unfair treatment due to race did not predict blood pressure in this sample of adolescents. The authors proposed that the extent of perceived responsibility for discrimination may play a role in these findings, as race is not a controllable attribute, but body weight is perceived to be attributable to personal control. Another hypothesis is that African Americans may have learned to cope with, or expect, stigma and prejudice in a White-dominated society and therefore have more strategies to deal with weight-related stigma and potentially buffer its harmful effects on health (Neumark-Sztainer et al., 1998). Additional work is clearly needed to understand the impact of weight discrimination on risk for hypertension and other health outcomes.

Although no other studies, to our knowledge, have assessed the health implications of weight stigma in this context, research has documented increased cardiovascular reactivity to racial discrimination and may lend additional insight to effects of weight stigma on health (Gyull, Matthews, & Bromberger, 2001; Lepore et al., 2006). For instance, recent experimental work demonstrated that perceived racism in social interactions increased physiological stress among Black but not White women (Lepore et al., 2006). Specifically, compared with White women, Black women displayed higher diastolic blood pressure in response to racial stigma, and those who made explicit race attributions had greater systolic blood pressure. Other work has demonstrated that internalization of racial stigma may have health implications. Specifically, one

study found that African Caribbean women who expressed high levels of internalized racism were at increased risk for abdominal obesity and glucose intolerance (Tull, Sheu, Butler, & Cornelious, 2005). Those women who internalized racism to a greater degree expressed higher levels of perceived stress and maladaptive coping strategies in response to racism (e.g., behavioral disengagement) than did those who had lower levels of internalization. The authors suggested that these factors may link high levels of internalized racism to dysregulation of cortisol and increased risk of metabolic abnormalities. Related research has also found a relationship between internalized racism and abnormal levels of fasting glucose that may be mediated through abdominal fat (Butler, Tull, Chambers, & Taylor, 2002).

In applying these findings to weight stigma, it could be that bias experienced by obese individuals creates a vicious cycle in which exposure to and internalization of stigma increases cortisol and metabolic abnormalities, which in turn further increases abdominal fat and perpetuates obesity, leading to additional stigma. This hypothesis needs to be tested. In light of the above research, it is important to note that there are differences between prejudices based on race versus those based on weight. In addition to distinctions of controllability of weight versus race, weight stigma is currently socially acceptable, prevalent, and often overt, whereas higher levels of social desirability suppression may inhibit expressions of racial stigma (Crandall, 1994). There may also be qualitative differences in experiences of both forms of prejudice (Neumark-Sztainer et al., 1998). However, there are also similarities in weight and racial stigmatization (e.g., bias toward African Americans), including some shared stereotypes (e.g., lazy, lacking self-discipline), shared relevance to symbolic racism that challenges traditional American values of discipline and self-control, and similar correlations with variables like authoritarianism, political ideology, and values inherent in the Protestant work ethic (see Crandall, 1994, for an analogy between racial and anti-fat attitudes). Thus, there may be much to learn from research on racial stigma, its negative effects on health, and the implications for children who face weight stigma.

Although this area of research is in its infancy, these findings can stimulate a new research agenda to examine the effects of weight stigma on health outcomes in children. One area that could be useful in these efforts is to identify the extent that weight stigma increases vulnerability to chronic stress and its negative effects on health among youths. In addition to the potential stress induced by weight stigma, some research suggests that increased body weight may increase risks for adverse reactions to stress among youths and that exposure to psychological stress predicts poor health outcomes in children (Goldbacher, Matthews, & Salomon, 2005; Matthews, Salomon, Brady, & Allen, 2003). It would indeed be informative to determine the ways in which weight stigma induces psychological and physiological stress in youths and how this stress is related to indices of health and body weight.

Status of Stigma-Reduction Efforts in Youths

Despite evidence documenting weight bias among youths by peers, educators, and parents, few published studies have specifically attempted to reduce stigma and negative attitudes toward overweight and obese children. As mentioned earlier, some research has attempted to reduce stigma among youths by addressing

perceptions of the controllability of body weight. One experimental study among children in Grades 3–6 attempted to reduce stigma by providing medical information to explain the cause of obesity (Bell & Morgan, 2000). This information had a positive effect on attitudes toward the obese peer among younger children but not among older children, who even displayed more negative behavioral intentions toward the obese peer. In a similar experiment, 74 children (Grades 4–6) were randomly assigned to an intervention group who received a 10-min presentation about the uncontrollability of body size or to a control group who participated in normal classroom activities (Anesbury & Tiggemann, 2000). Although children in the intervention group reduced the amount of personal control that they attributed to obesity, the intervention did not alter negative stereotypes of obese individuals compared with those of children in the control group. This work suggests that beliefs about the causes of obesity may be more amenable to change but that negative attitudes may be more resistant to modification in children.

Limited work has attempted to improve anti-fat attitudes among teachers. Hague and White (2005) tested a Web-based educational module about size acceptance among 258 student teachers and school teachers. Participants taking an online course about obesity were randomly assigned to one of five conditions, including a control group and four intervention groups that manipulated the credibility and body size of the course presenter who provided online lectures on topics including the causes of obesity, consequences of weight stigma, social pressures to be thin, and strategies to help children cope with stigma and to promote a bias-free school setting. Negative attitudes improved in intervention groups, and exposure to a credible overweight presenter improved attitudes more than it did to a credible nonoverweight presenter. Although these results are encouraging, the sample in this study was a self-selected group of teachers who chose to participate in a course on obesity. It is also not clear how the content of the modules contributed to attitude changes. More work is needed to identify whether Internet-based interventions have promise in stigma-reduction efforts and to determine the generalizability of these findings to more diverse samples of educators.

In addition to stigma-reduction interventions aimed at children, it may be important to implement promotion of weight tolerance through existing school-based curricula that address issues of diversity and bias. As an example, one study improved weight acceptance attitudes among elementary school children through a school curriculum that aimed to increase body size acceptance and diversity and to discourage teasing (Irving, 2000). Other researchers have suggested that school educators need training to increase their understanding of the etiology of obesity, strategies to address weight teasing, skills to meet needs of overweight students, and awareness of their own biases (Neumark-Sztainer & Eisenberg, 2005).

No work, to our knowledge, has attempted to reduce weight stigma among parents, family members, or other caregivers of obese children. This is clearly another area in need of research attention, so that strategies can be tested and implemented to help increase awareness of bias and to teach parents to recognize and challenge their own attitudes and stereotypes about weight that may negatively influence their children. It may also be useful to develop specific components of clinical treatments for obesity in children that address issues of weight stigma with children and

their families to help eradicate bias and prevent stigma from creating obstacles in adopting healthy lifestyle changes. Healthcare providers such as pediatricians can also raise awareness of weight stigma with parents of obese children and can provide parents with education and strategies to prevent stigma and its negative consequences for their children.

Finally, an important target for research on stigma-reduction strategies is the media, especially given the extent that television and advertising perpetuate ideals of thinness (H. Klein & Schiffman, 2005; Tiggemann & Slater, 2004). Only one study, to our knowledge, has examined television viewing in relation to weight stigma in children. This study demonstrated that television exposure increased fat stereotyping among 303 children, ages 6–8 years old (Harrison, 2000). Specifically, the more television that boys reported viewing, the more likely they were to negatively stereotype an overweight female target. The role of mass media in the development and expression of stigmatizing attitudes and behaviors needs further study. It will also be useful to test whether weight stigma by peers, parents, and educators can be reduced through media tools, such as exposure to overweight role models on television, celebrity endorsement of weight tolerance, or overweight television characters who challenge common weight-based stereotypes.

Overall, it is concerning that so little work has studied ways to reduce weight stigma given the prevalence of bias toward obesity in youths. Research efforts should move beyond the documentation of weight stigma to the identification and implementation of effective methods to eradicate bias toward obese youths in school and home settings. Specific research questions that should be addressed to identify and understand effective strategies of reducing bias toward youths are highlighted in the conclusions of this review.

Childhood Obesity Prevention: What Role Does Stigma Play?

A Potential Motivator of Change?

When presenting on weight stigma and stigma reduction at professional conferences and community groups, we have often been asked the question, “Isn’t stigma helpful in motivating weight loss?” If it were, then the increase in stigmatization of obese children over the past 40 years (Latner & Stunkard, 2003) should have been accompanied by a decrease in childhood obesity rather than by the recent alarming increase (Y. Wang & Lobstein, 2006). Furthermore, recent research suggests that overweight and obese persons who experience weight bias report coping with stigma by eating more food and refusing to diet, both of which are behaviors that may further contribute to obesity (Puhl & Brownell, 2006).

There are a number of empirically supported strategies that can help to prevent or reduce childhood obesity, but it is clear that weight stigmatization is not one of them. Strategies recommended for prevention of childhood overweight, such as changes in television viewing, in the consumption of sweet beverages and fast food, and in parental feeding practices (Dolan & Faith, in press), focus on definable and observable positive behavior changes. Neumark-Sztainer (2005) has also recommended that prevention and treatment programs address body image concerns, and she has warned that “there is potential for unintentional negative side

effects on body image after participation in an obesity treatment or prevention program that does not address body image concerns, or even sees body dissatisfaction as a necessary motivator for change” (p. 222). These negative side effects could include consequences of weight bias reviewed here, such as low self-esteem or body dissatisfaction, vulnerability to depression, unhealthy eating behaviors, or avoidance of physical activity. To reduce negative messages presented about weight, O’Dea (2000) recommended for educators and health professionals to present concepts about food, nutrition, and body weight in a positive light and “to avoid the common negative approach of focusing on junk food, bad foods, overweight, and other such terms” (p. 127).

Henderson and Schwartz (in press) have suggested ways that parents helping their children with weight control efforts can also try to protect them from stigmatization. First, because healthcare professionals, even those who specialize in obesity, are not immune to biased attitudes (Schwartz, O’Neal, Brownell, Blair, & Billington, 2003), parents may wish to monitor the interactions between their child and pediatrician and, if needed, insist that their child be dealt with kindly and sensitively. Parents also should neither ignore nor condone bullying and teasing of their child at school, even though some parents might hope that this teasing will motivate their child to lose weight (Henderson & Schwartz, in press). No evidence exists to suggest that it does. As Schwartz and Brownell (2004) have warned, it would be dangerous to conclude that even if weight-based stigmatization might help motivate people to change, it could ever be justifiable.

Framing Messages in Childhood Obesity Prevention

As childhood obesity prevention programs are increasingly developed and implemented in schools and community settings, efforts to promote health in overweight and obese children must simultaneously protect them in the face of social stigmatization and its consequences. O’Dea (2005) cautioned that childhood obesity prevention programs have the potential to further stigmatize overweight and obese youths and that negatively focused health messages (e.g., that emphasize the undesirability of being overweight) may lead students to feel worse about themselves. To avoid the many potential psychosocial and physical health consequences that can result from bias, researchers must take careful consideration of how messages are framed in programs to address childhood obesity. As an example, a balance needs to be achieved between encouraging overweight children to participate in physical activities versus forcing unwilling participation, which may lead obese youths only to avoid these activities in the future (O’Dea, 2005). Body-related concerns have been reported as specific and frequent barriers to participating in physical activity by overweight students, suggesting that health-promotion interventions need to encourage physical activities that minimize body consciousness, enhance adult and peer support of engaging in physical activity, and promote body esteem among overweight youths (Zabinski, Saelens, Stein, Hayden-Wade, & Wilfley, 2003). These messages seem especially important in light of research (described earlier) indicating that weight bias from peers and PE teachers may lead to avoidance of physical activity among overweight and obese youths (Bauer et al., 2004; Faith et al., 2002; Storch et al., 2006).

Messages about body weight and personal responsibility for obesity are also important to consider in light of stigma and obesity prevention. In an analysis of health curricula among public middle schools in Ontario, Larkin and Rice (2005) found that existing programs do not consider body-based harassment and that contradictory messages are communicated to students if they are taught healthy eating practices but are also exposed to conflicting values of body acceptance. They propose that prevention programs that emphasize body weight may worsen anxiety and body image among students, especially in the context of weight-based harassment at school. They also note that health curricula often reinforce individual responsibility for weight while paying little attention to external sources and contributors of eating and weight problems. Given the research presented in this review linking attributions about control and causality of body weight to negative stereotyping, and given the vulnerability of overweight and obese youths internalizing societal stigma and negative stereotypes, it is imperative to consider how messages should be framed to children about notions of personal responsibility for weight. O'Dea (2005) cautioned that obesity prevention messages should avoid individually focused approaches to obesity that may be more likely to blame the victim and may increase levels of guilt, humiliation, and hopelessness among obese children and their parents.

Overall, there is increasing agreement that obesity prevention programs need to take measures to prevent weight-based stigmatization in youths. The recent 2005 report issued by the Institute of Medicine on "Preventing Childhood Obesity" acknowledged the importance of considering stigmatization and recommended shifting the focus of prevention efforts to emphasize behaviors that can be changed to promote health rather than to emphasize individual children and their appearance (Koplan, Liverman, & Kraak, 2005). The Weight Realities Division of the Society for Nutrition Education (2003) also recommends that obesity prevention school-based programs include promotion of weight tolerance, school policies that prohibit weight-based teasing and victimization, and periodic assessment of bias to prevent unintentional stigmatization. Researchers have further noted that, because maladaptive eating behaviors and binge eating are consequences of exposure to weight-based teasing, obesity prevention approaches need to specifically address weight-based victimization (Neumark-Sztainer & Eisenberg, 2005).

Thus, it will be key for prevention efforts to communicate messages that encourage health behaviors for all children, regardless of their body size. It may be especially useful for interventions to focus on health as both the primary motivator and desired outcome for positive lifestyle behaviors in children rather than focus on weight or thinness. To facilitate participation in and enjoyment of health behaviors by overweight youths, program leaders must also remove blame from children who are overweight, provide education about weight bias to students and adults, and implement policies that prohibit weight-based victimization. With these changes in place, children of all weights can begin to receive support from peers, adults, teachers, and parents to make healthy food choices and be physically active.

Methodological Considerations

Weight-based victimization appears to have a range of negative consequences for overweight youths, including poorer body im-

age, unhealthy eating behaviors, binge eating, lower self-esteem, and higher risk of depression (Cattarin & Thompson, 1994; Eisenberg et al., 2003; Haines et al., 2006; Hayden-Wade et al., 2005; Lunner et al., 2000; Neumark-Sztainer et al., 2002; Shroff & Thompson, 2004; Thompson et al., 1995; Van den Berg et al., 2002; Young-Hyman et al., 2003). Often, weight is unrelated to most of these outcomes after teasing is controlled for, suggesting that teasing and victimization, rather than weight, may be the relevant factors predicting negative emotional well-being (Eisenberg et al., 2003; Hayden-Wade et al., 2005; Thompson et al., 1995). Table 1 highlights these and other key findings that can be concluded about weight bias in youths on the basis of existing evidence. However, several methodological limitations are important to consider in evaluating this body of literature, and highlighting and addressing these could improve future research on weight bias toward children.

Measurement of Stigma

Much of the existing research has used self-report measures and line-drawing silhouettes as stimuli to assess stigmatizing attitudes. To strengthen the validity and generalizability of this work, researchers must implement additional methodologies to assess stigma, such as behavioral observations of children and adults in school and home settings. Although research on teasing suggests that stigmatizing attitudes lead to victimization (reviewed earlier in this article), more work is needed to specifically examine whether, and to what extent, negative stereotypes translate into discriminatory behaviors and interactions with overweight and obese youths. Few studies have tested this, and those that have used methods with questionable validity, such as projective techniques (e.g., Lerner et al., 1975a). It will be critical to examine whether negative attitudes by peers, parents, and teachers translate into discriminatory behaviors and unfair treatment of obese youths. In their review of the literature on stigmatization in children over 20 years ago, Jarvie and colleagues (1983) concluded that despite the increasing attention to negative attitudes among youths, few studies had specifically examined the behaviors of individuals interacting with obese children to build evidence that they are discriminated against. This continues to be a limitation of the literature today.

In addition, few studies have distinguished between different forms of victimization (e.g., verbal, physical, relational). These types of stigma may have a differential impact on obese youths, and it is still unknown how different forms of bias may effect children or whether they have additive or multiplicative effects. For example, general peer bullying in schools, including physical, verbal, and indirect bullying, has been associated with psychological and physical health consequences in cross-sectional, retrospective, and longitudinal research (Rigby, 2003).

The personal experience of weight bias and teasing severity are almost universally self-reported variables. Although weight teasing that overweight youths are exposed to might indeed be more severe or frequent than is the teasing directed at nonoverweight youths, it is also possible that overweight children are more sensitive to teasing or more affected by it than are their nonoverweight peers (Neumark-Sztainer et al., 2002). This could lead to an inadvertent overreporting of either the occurrence or consequences of weight stigma. In addition, the occurrence of and vulnerability to weight bias may be two significant yet separate

Table 1
Key Conclusions of Research Evidence Addressing Weight Bias in Youth

Topic	Key findings	Level of evidence
Nature/extent of bias		
Sex	Weight bias is experienced by both overweight boys and girls, although types of victimization may differ by sex	C, D, L
Age	In some studies, attitudes among and towards girls may be more negative Negative attitudes towards obesity increase during childhood and may level off or even decrease into adulthood	C C
Ethnicity	African American youth may be similarly vulnerable to weight bias as Caucasian students In some studies, Caucasian children may have more negative attitudes than Japanese or Mexican children	C, D C
Body weight	Higher BMI in children and adolescents is associated with more frequent and intense victimization	C, L
Causal attributions	Negative attitudes towards obesity are held by children who are themselves overweight The belief that weight is under personal control is associated with increased weight bias Changing beliefs about causality can reduce blame and, in some studies, reduce stigma	C, E C C, E
Sources of bias		
Peers	From an early age, children ascribe negative attributes to overweight peers compared to average weight peers The specific characteristics ascribed to peers may broaden over the course of development	C, E C
Educators	Teachers, school principals, and college selection committees may have negative attitudes towards obese youth	C
Parents	Parents endorse and may transmit weight-based stereotypes to their children Sons and daughters experience weight-related teasing, and daughters financial discrimination, by their parents	C, D C, R
Consequences of bias		
Self-esteem	Internalization of weight stigma and weight-based teasing are associated with lower self-esteem in obese youth	C, L
Depression	Weight-based teasing is related to increased vulnerability of depression in overweight and obese adolescents	C
Body dissatisfaction	Weight-based victimization may increase the risk of body dissatisfaction in overweight and obese youth In some studies, weight-based teasing is related to body dissatisfaction independent of BMI, gender, and race	C, R C, R
Peer relationships	Obese youth are liked less, chosen less as friends, and rejected more often by peers than average-weight youth Some overweight youth attribute rejection to their weight, and believe weight loss would increase their friends	C C, D
Suicidal behaviors	Weight-based victimization is associated with increased suicidal ideation; those who are teased about their weight report more suicidal ideation than peers who are not teased	C
SES	Obese youth experience future SES disadvantages, although the contribution of weight bias has not been tested	C, L
Academic outcomes	The relationship between obesity and cognitive/academic abilities in youth has yielded mixed findings (Whether weight bias impairs scholastic progress or academic self-efficacy has not been studied)	C, L
Eating behaviors	Eating disturbances occur more often among youth who are teased about their weight than those not teased	C
Physical activity	Childhood teasing experiences are more common among individuals with more frequent binge eating Weight-based victimization by peers is associated with lower levels of physical activity	L, R C, D
Cardiovascular health	Perceived unfair treatment due to appearance is related to elevated ambulatory blood pressure in adolescents, even after controlling for BMI, and other typical determinants of blood pressure	C
Stigma reduction	Providing external explanations for obesity can change children's perceptions about the causes of obesity, but may be less likely to improve negative attitudes Web-based educational modules on weight stigma can improve negative attitudes among teachers	E E

Note. Level of evidence refers to types of studies that have been conducted on each topic, where C = correlational/cross-sectional, D = descriptive, E = experimental, L = longitudinal, and R = retrospective. SES = socioeconomic status.

variables, which could interact or work synergistically to increase eating disturbances and other negative consequences. The occurrence of teasing and a child's vulnerability to its effects should be measured separately in future studies, and corroborative evidence should be collected from parents and teachers where possible. A further methodological limitation of some studies is the collection of data on childhood experiences retrospectively (e.g., Fairburn et al., 1998; Grilo et al., 1994;

Jackson et al., 2000; Striegel-Moore et al., 2002). This research method requires long periods of recall, and (as discussed above) may be subject to selective or biased retrieval.

Another form of bias that may influence the retrieval of comprehensive information about obesity stigma is publication bias. Unfortunately, research demonstrating null findings may be more likely to remain unpublished and thus inaccessible for inclusion in literature reviews.

Finally, several studies of weight bias and its putative consequences have been cross-sectional, rather than prospective, limiting causal conclusions. For example, it is possible that children with greater eating disturbances experience greater weight bias, such as teasing, as a result of these disturbances, or that both problems occur because of a third factor. A biological predisposition may account for both higher body weight (and resulting weight stigmatization by others) and greater binge eating.

Moderators, Mediators, and Protective Factors

Taken together, the literature has indicated that rates of depression, low self-esteem, body dissatisfaction, and other psychopathology are higher in clinical samples than in community samples of obese children. Although more work is needed to conclude that stigma is responsible for psychological consequences of obesity in youths, a number of studies have demonstrated that psychological outcomes often disappear after controlling for stigmatizing experiences, such as teasing and victimization. This suggests that reducing weight stigma may in turn reduce adverse outcomes for emotional well-being among obese children and adolescents. More research is needed to examine weight stigma as a moderator for negative psychological outcomes.

The findings of population-based studies that obese children do not appear to have lower levels of self-esteem or body dissatisfaction may lead some to question whether they are affected by the social consequences of obesity. It has been proposed that some obese children could be resilient to the negative social consequences of obesity, just as some children with other physical stigmas do not display poorer self-esteem or rates of depression (Wardle & Cooke, 2005). Thus, it is important to recognize that poorer psychological adjustment is not an automatic outcome of obesity in children but that certain subgroups of children may be more vulnerable to various psychological outcomes than are others. Another priority for research efforts is to determine what factors help protect obese children from negative psychosocial consequences and stigma. For instance, one study found that overweight adolescents who reported strong parental connectedness reported higher levels of psychosocial well-being than did those who did not, leading the authors to conclude that positive family relationships may protect against the consequences of stigma (Mellin, Neumark-Sztainer, Story, Ireland, & Resnick, 2002). Much more work is needed to identify protective factors for psychological and social well-being. Specifically, investigations of children who are overweight but do not experience bias and of overweight children who do experience bias but do not suffer negative effects could begin to pinpoint factors that protect children from weight-related victimization and its consequences.

Research that examines mediators and moderators of the relationship between childhood obesity and various psychosocial health indices will help to identify vulnerable and protected groups of children and adolescents. In particular, it will be important to disentangle the effects and relative importance of sex, ethnicity, age, and SES on existing findings. Additional research is needed to address moderators of weight stigmatization, the prevalence of stigma in different ethnic and racial groups, and the nature and impact of different forms of weight stigma on emotional and social development across groups. Studies also need to clarify whether, and to what extent, variables of sex, age, degree of body weight,

and SES influence the experience and impact of weight stigma. Another promising avenue for future research is examining attributions of causality in the origin of weight bias against youths, and studies are needed to further explore how this impacts the formation and reduction of bias.

Conclusions and Directions for Future Research

The stigmatization directed at obese children, by their peers, parents, educators, and others, is pervasive and often unrelenting. It has been extensively documented across diverse samples of children using diverse research methods. As a result of weight bias and discrimination, obese children suffer psychological, social, and health-related consequences. Substantial change is needed to combat this bias. The negative attributes and prevalent stereotypes about overweight persons presented in the media need to be altered, and stigma-reduction programs urgently need to be developed and tested.

The scientific literature is clear in demonstrating that overweight and obese youths are targets of stigma. However, additional work is needed to better understand the consequences of bias toward children and to determine how to effectively eradicate weight stigma. Research on changing weight bias among youths is still in its infancy. A next generation of science is needed to move beyond documentation of weight stigma toward youths. Table 2 outlines areas of research that we believe are priorities for future efforts.

Research so far suggests that obesity may increase vulnerability to adverse physiological reactions to psychosocial stressors among youths. Experiences of weight stigma may specifically exacerbate negative health outcomes through heightened blood pressure, cortisol reactivity, and risk for hypertension. Given that similar findings pertaining to obesity and vulnerability to stress are emerging in both children and adults, it may be that obesity beginning in childhood heightens vulnerability to a long-term trajectory of negative physical responses to chronic psychosocial stressors. This could in turn increase various cardiovascular risk factors. These health problems often affect overweight children. Many of the negative psychosocial consequences of weight bias occur above and beyond the influence of high body weight, and this appears to be the case for negative health consequences as well (Matthews et al., 2005). Therefore, the health consequences common among obese children may partly result from the effects of discrimination. Further research should determine whether prejudice and victimization have direct detrimental effects on health indicators such as cardiovascular dysfunction and blood pressure in overweight children.

This area of research must become a priority to investigate the various pathways through which weight stigma may have an impact on health. Many important and unanswered questions remain. For instance, how does weight stigma affect stress levels of children, and what is the impact of this unique form of stress on their health? How does chronic exposure to weight stigma over time influence cardiovascular health? Are health outcomes worse for children who experience stigma at higher levels of obesity? Are obese children who internalize stigma at heightened risk for health problems compared with those who do not internalize? Does weight stigma have different health implications for children of different gender, ages, and ethnic backgrounds? Do different forms

Table 2
Summary of Research Areas to be Addressed in Weight Stigma Among Youth

Domain	Research areas
Nature/extent of stigma	<p>Longitudinal studies to examine gender differences in weight stigma</p> <p>Prospective work to determine whether anti-fat attitudes change throughout childhood, and reasons for potential developmental shifts</p> <p>Cross-cultural examinations of vulnerability to weight stigma in youth</p> <p>Assessment of ethnicity and endorsement of stigma across gender, age, and weight</p> <p>Examination of the relationships between body weight, stigma, and internalization of stigma among overweight youth</p> <p>Examination of the formation of attributions about causality of obesity, how these attributions influence biased attitudes, and whether modification of attributions improves attitudes in youth</p> <p>Identification of the origins of weight bias and of interpersonal differences that influence the perpetuation of stigma toward youth</p> <p>Assessment of discriminatory practices and unfair treatment toward obese youth</p> <p>Experimental work to clarify attitude-behavior consistency in weight bias</p> <p>Examination of individual differences in the vulnerability to weight bias and its consequences</p> <p>Validation of self report measures of stigmatizing attitudes using corroborative evidence from friends, parents, or teachers</p>
Sources of stigma	<p>Examination of possible evolutionary explanations to account for the origin of biased beliefs about obesity</p> <p>Identification of prevalence, nature, and severity of stigma by educators</p> <p>Multiple assessment measures to investigate differential treatment of obese youth in classrooms and educational admissions procedures</p> <p>Examination of the nature and impact of stigma communicated by parents</p> <p>Identification of whether weight stigma extends to parents of obese youth</p> <p>Identification of other sources of bias toward obese youth (e.g., health care providers, coaches, camp counselors, employers)</p>
Psychosocial consequences of stigma	<p>Examination of whether stigma increases vulnerability to low self-esteem, depression, and body dissatisfaction</p> <p>Examination of stigma as a moderator for adverse psychosocial outcomes</p> <p>Assessment of the effect of different forms of weight-based victimization on emotional, social, and academic outcomes for obese youth of different ages and ethnicity</p> <p>Assessment of whether reductions in weight stigma improve social, emotional, and academic outcomes among obese youth</p> <p>Identification of protective factors that buffer obese children from negative consequences of stigma</p> <p>Examination of whether different types and sources of weight stigma have a differential impact on psychosocial outcomes</p>
Academic & SES outcomes	<p>Identification of whether weight bias is a possible mediator of the relationship between obesity and economic and academic attainment</p> <p>Prospective investigation of the relationship between cognitive and academic ability, weight, and socioeconomic status</p> <p>Testing methods for reducing weight bias in educational settings, with dependent variables that include academic as well as psychological outcomes</p>
Eating behaviors	<p>Investigation of the effects of verbal commentary or teasing on eating behavior using prospective investigations</p> <p>Investigation of stigmatizing parental behaviors and their effect on disordered eating</p> <p>Experimental research investigating the possible influence of negative commentary on eating behavior or binge eating</p>
Physical health and stigma	<p>Examination of pathways that weight stigma affects physical health</p> <p>Identification of how weight stigma affects stress levels in youth</p> <p>Examination of how chronic exposure to weight stigma influences cardiovascular health outcomes in youth</p> <p>Assessment of whether health outcomes are worse for children who experience stigma at higher levels of obesity</p> <p>Identification of whether obese children who internalize stigma are at increased risk for health problems versus those who do not internalize</p> <p>Examination of health implications of weight stigma for children of different gender, ages, and ethnic backgrounds</p> <p>Examination of whether different types and sources of weight stigma have a differential impact on cardiovascular reactivity of children</p>
Stigma reduction	<p>Identification and assessment of strategies to reduce weight-based victimization by peers in school settings</p> <p>Integration and testing of stigma-reduction interventions as part of existing school-based diversity curricula</p> <p>Assessment of stigma-reduction methods to improve attitudes in educators</p> <p>Identification of ways to reduce weight stigma among parents, family members, and other caregivers of obese youth</p> <p>Examination of effectiveness of different message frames for stigma reduction efforts (e.g., inducing empathy, education about causes of obesity, awareness of inaccuracy of stereotypes, etc.)</p> <p>Identification of most effective modes of delivery for stigma reduction messages (e.g., videos, presentations, reading materials, Internet)</p> <p>Assessment of effectiveness of Internet-based interventions to reduce bias</p> <p>Assessment of the effect of stigma reduction on emotional, social, health, and academic outcomes in youth</p>

Note. SES = socioeconomic status.

(e.g., verbal, physical, relational victimization) or sources of weight stigma (e.g., parents vs. peers) have a differential impact on cardiovascular reactivity of children? These questions have critical importance for understanding the health of obese children and for preventing additional adverse medical consequences.

If weight-based discrimination does account for a significant proportion of the health impairment suffered by obese children, then efforts at merely reducing the weight of the individual child are not sufficient to address the real problem. First, although weight loss may result secondarily in a reduction of bias, early teasing and victimization may have a lasting, harmful effect that persists even once an overweight child becomes thin. Second, discrimination could continue during or after weight loss. Third, if prejudices go uncorrected, the same unchanged sources of bias will continue to harm future generations of overweight children. The problem is a societal one, and broader, population-level efforts at reducing stigma are needed. Weight-based discrimination is as important a problem as racial discrimination or discrimination against children with physical disabilities. Remedying it needs to be taken equally seriously, if we are to protect the emotional and physical well-being of our nation's children.

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