CHAPTER 6

THE PSYCHOLOGY OF OBESITY

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The field of psychology traditionally focuses on the study of individuals, their internal mental processes, and their behavior; as such, it has adopted this approach in the study of obesity. Rather than examining larger groups, such as communities, or distal factors, such as laws, policies, or environmental barriers, psychologists have explored people's emotions, beliefs, goals, and behaviors as causes and consequences of obesity. In recent years, however, and paralleling the direction of the field as a whole, psychologists have broadened their focus to include the influence of relationships and social networks on obesity, as well as the role of genetic and neurological factors in the development of obesity. With regard to treatment, psychologists have focused primarily on behavioral rather than medical interventions, and recently have begun to explore whether weight loss is a reasonable or even necessary goal in treatments for obesity.

Causes of Obesity

A substantial body of work in psychology has been dedicated to exploring the causes of obesity. Psychology originally viewed obesity as a result of psychopathology or as a response to a significant trauma in a person's past (Kolata 2007). However, support for these assumptions has been mixed, and these explanations are not thought

to account for most cases of obesity (Stunkard and Wadden 1992). Rather, the focus has been on individual factors such as thoughts, behaviors, and biology, as well as aspects of the individual's social environment such as familial and peer influences. Many early theories of obesity continue to be refined and incorporated into current etiological models.

The Individual

In 1957 it was proposed that obesity was the result of overeating—a behavioral factor—and was not exclusively due to impaired metabolic functioning (Kaplan and Kaplan 1957). Much of the work within the field has since focused on behavioral, rather than biological, causes of obesity, and on overeating in particular. Early research focused on differences in eating between obese and non-obese individuals, but over time it became clear that many of the factors that promote overeating in obese individuals also promote overeating in some non-obese individuals. Interest has not only focused on determining *who* overeats, but also *when* and *why* overeating occurs. Four major individual factors have been explored as causes of overeating: interoceptive awareness (i.e., sensitivity to internal bodily states), response to emotional experience, cognition, and biology.

Schacter's internal-external theory of eating holds that different factors guide eating for obese individuals from those that guide eating for non-obese individuals (Schacter 1968; Schacter, Goldman, and Gordon 1968). According to this theory, non-obese individuals use the internal sensations of hunger and satiety to guide their eating, whereas obese individuals are less interoceptively aware and instead rely on external cues such as the time of day or the presence of appetizing foods to regulate eating. Although this theory is intuitive and parsimonious, original support for it was mixed and its basic premises have since been questioned (Rodin 1981). In particular, some have challenged the assertion that an overreliance on external cues by obese individuals necessarily indicates that they are less interoceptively aware than non-obese individuals (Rodin 1981; Herman and Polivy 2008). Furthermore, it has also been argued that non-obese individuals are not better than obese people at using internal cues to regulate their eating, and that they are also influenced by external cues (Rodin 1981; Herman and Polivy 2008).

Although it has been challenged, the internal-external hypothesis has not been abandoned; rather, recent work has instead been expanding upon it. For example, Herman and Polivy (2008) posit that the conflicting findings from past research actually demonstrate a clear pattern of eating behavior. They argue that some types of external cues (e.g., portion size), which the authors refer to as *normative* cues, influence everyone, whereas other cues (e.g., palatability), called *sensory cues*, only impact the eating of obese and dieting individuals. Thus the internal-external hypothesis is still present in the way in which we view the causes of obesity.

Differences in the way individuals respond to emotional experience is another factor that is thought to play a role in the development of obesity. According to the psychosomatic hypothesis (Kaplan and Kaplan 1957), obese people overeat as a way

of coping with emotional distress. Obese individuals are thought to have learned that eating reduces feelings of anxiety and therefore overeat as a way to self-soothe. This results in a continuous cycle in which overeating aimed at reducing distress actually promotes further distress and subsequent overeating (Kaplan and Kaplan 1957). Similarly, and foreshadowing the internal-external hypothesis, Bruch theorized that obese individuals have difficulties with interoceptive awareness and therefore misinterpret emotional states as hunger (Bruch 1961).

Although these early theories have received only mixed support (Greeno and Wing 1994), eating in response to emotional experience is still viewed as an important contributor to overeating and obesity (Canetti, Bachar, and Berry 2002). Research shows that some individuals, not exclusively obese individuals, exhibit a tendency to overeat when in the presence of strong emotion, particularly negative affect (e.g., Van Strien and Ouwens 2003; Polivy, Herman, and McFarlane 1994). While emotional eating is well documented, it is still unclear *why* such behavior occurs. Many studies have been unable to demonstrate that emotional eating attenuates negative affect (i.e., negative emotion states such as anxiety) (e.g., Herman and Polivy 1975). Recent work, however, found that eating palatable food improved mood among individuals classified as emotional eaters (Macht and Mueller 2007). Replication of this effect and clarification of moderators and mechanisms will be essential to this growing body of work.

The third individual factor thought to contribute to overeating, cognitive control, was introduced in a study by Herman and Mack (1975). This study highlighted what has been termed the *disinhibition effect*—the phenomenon that restrained eaters, or dieters, engage in overeating after a perceived diet violation. This phenomenon is considered a cognitive one (as opposed to a physiological one, for example) because what matters is not whether restrained eaters actually violated their diets, but whether they *think* that they did. Research supporting the role of cognition shows that restrained eaters will overeat if they believe they have violated their diet when in fact they did not, but they will not overeat after an actual diet violation if they are led to believe that the food they consumed did not actually violate their diet (Polivy and Herman 1985).

An individual's self-imposed restraint essentially functions as a form of self-control and is therefore susceptible to a broad range of factors known to contribute to regulatory failures. These factors, such as ego threats (Heatherton, Herman, and Polivy 1991), stress (Greeno and Wing 1994), and distraction (Mann and Ward 2000), have been shown to lead to overeating among restrained eaters, but not among non-restrained individuals. Although restraint status has proven to be a reliable indicator of overeating and has generated a considerable amount of research, there is controversy over how it is best conceptualized and measured (Ruderman 1986); many believe that restraint only leads to self-regulation failure among individuals who are also disinhibited eaters.

The fourth factor that has been explored as a source of overeating is individual differences in biology. In an effort to explain discrepant results of externally based eating behavior among obese individuals, Nisbett proposed a biological explanation

known as set-point theory (Nisbett 1972). According to Nisbett, everyone has a biologically determined and physiologically defended weight set-point that ultimately guides eating behavior. Regardless of current weight status, obese and nonobese individuals may at times be below their actual set-point, causing them to be in a state of deprivation that promotes externally guided eating. When individuals are at their set-point, deprivation ceases and externally guided eating diminishes. Set-point theories suggest that biology is a key predictor of obesity, but they are impossible to prove or disprove and cannot account for a variety of eating phenomenon, ultimately limiting their utility (Pinel, Assanand, and Lehman 2000).

Current research is examining how underlying differences in neurobiology guide eating behavior. For example, there are promising results in neuroimaging research on impulsivity, craving, binge eating, and restraint (Lowe et al. 2009). Such work may help explain conflicting results found in behavioral research and may provide necessary insight into the transactional relationship between internal and external variables.

The Environment

In addition to individual variables that contribute to overeating and the development of obesity, psychologists also focus on environmental causes, including familial and social influences.

Because obese children are likely to become obese adults (Epstein, Wing, and Valoski 1985), factors associated with the development of pediatric obesity, including the family environment, are the focus of much research. Parents affect the eating of their children both directly and indirectly. Parental influence, whether by modeling eating behavior, directly controlling their children's eating behavior, or providing feedback regarding the child's weight and shape, has been shown to foster restrained and disinhibited eating in children (e.g., Cutting et al. 1999; Pike and Rodin 1991; Carper, Fisher, and Birch 2000; Francis and Birch 2005). A restrained eating style, as mentioned above, promotes vulnerability to disinhibition and overeating, increasing the likelihood that obesity will result.

Preliminary evidence suggests that chronic levels of psychological stress in the family are related to obesity in children (Koch, Sepa, and Ludvigsson 2008). Psychological stress encountered in childhood may lead to the development of an emotional eating style. A recent study conducted by Greenfield and Marks (2009) found that individuals who reported experiencing physical and psychological violence from their parents when they were children had a greater risk for adult obesity than those who had not experienced such violence. Moreover, the association between a past history of physical and psychological violence and obesity was partially mediated by the use of food as a coping response to stress. Family stress levels, like parental influences over eating, appear to contribute to obesity by fostering individual behaviors that are associated with overeating.

In addition to familial influences on overeating and obesity, researchers have also looked at other social influences. A recent study by Christakis and Fowler (2007)

investigated the "social spread" of obesity; that is, they examined whether weight gain in one individual was correlated with weight gain in members of their social networks. Their results suggest that obesity can spread through social ties. While the findings are not able to speak to mechanisms through which this may occur, the authors suggest that social influences may promote obesity by changing norms for acceptability of being overweight and also by directly influencing individual behaviors such as eating. A study exploring social influences of obesity in adolescents found similar results as overweight adolescents were more likely to have overweight friends than their normal weight peers (Valente et al. 2009). Recent work, however, has critiqued the methodology used to investigate social network effects and has argued that the studies should be interpreted with caution (Cohen-Cole and Fletcher 2008).

The past 50 years of research on the psychological causes of obesity have helped to isolate many important predictive factors and to clarify that obesity results from a variety of intra- and inter-individual factors. We hope that these factors (and other newly isolated factors) can ultimately be combined into an integrated model that can predict who will become obese and why.

Correlates or Consequences of Obesity

Because research on the causes and consequences of obesity is correlational by nature, any variable that is found to be associated with obesity can technically only be considered a correlate, as opposed to a predictor or a consequence. However, the literature does divide the correlates of obesity into those that have been shown to precede obesity in time and are thought to be causes, and those that follow obesity and are thus considered to be consequences. In this section, we focus on factors that may be consequences of obesity, or perhaps only correlates, but that we are reasonably certain are not causes.

Stigma and Discrimination

Overweight and obese individuals face stigmatization and unfair treatment simply because of their weight. It is often assumed that denigration and derision of overweight individuals can only serve to help motivate weight loss, justifying prejudice and discrimination as "for their own good" (Brownell 2005). In actuality, perceived weight discrimination and stigmatization likely have negative effects on an individuals' psychological well-being (Hatzenbuehler, Keyes, and Hasin 2009) and may contribute to the physical health problems (Maclean et al. 2009) that are usually directly attributed to obesity.

Implicit bias against overweight is particularly strong (Teachman et al. 2003), equivalent—if not greater than—bias due to age, race, and gender (Nosek, Banaji,

and Greenwald 2002). Moreover, Puhl, Andreyeva, and Brownell (2008) demonstrated that approximately 5 percent of overweight (BMI between 25 and 30) men and 10 percent of overweight women experienced weight discrimination on a daily basis. For individuals with a BMI greater than 35, these numbers jumped to 28 percent and 45 percent for men and women, respectively. Among this segment of society, daily interpersonal discrimination—through decreased civility and increased harassment and rejection—is the agonizing norm.

Physicians and other health care professionals routinely endorse negative stereotypes about their overweight and obese patients. In a recent survey involving primary care physicians, more than half of the physicians in the sample believed that their obese patients were awkward, unattractive, and non-compliant, and a third believed that they were weak-willed, lazy, and sloppy (Foster et al. 2003). Given the sensitive nature of explicitly admitting such beliefs, this number is undoubtedly an underestimation. Similar stigmatizing attitudes are also expressed by the next generation of doctors, medical students (Wear et al. 2006). Particularly concerning is how this biased perception translates into diminished care for overweight patients. Nearly 70 percent of overweight and obese women reported weight stigmatization from their physician (e.g., inappropriate comments about their weight), and 46 percent reported similar experiences from nurses (Puhl and Brownell 2006). Given how likely it is for obese patients to view the medical setting as stigmatizing or threatening, it is not surprising that many patients avoid or delay treatment (Drury and Louis 2002). This under-utilization of health care services may lead to some of the physical health problems that are attributed to obesity.

Overweight individuals also face noticeable discrimination in employment settings, where they tend to be stereotyped as less conscientious and agreeable than non-overweight employees (Polinko and Popovich 2001). A meta-analytic review of weight discrimination in employment concluded that overweight applicants were at a particular disadvantage when applying for jobs with considerable contact with the public, and that they were rated less favorably when being evaluated as a potential coworker (Roehling et al. 2008). In a survey of over 2,000 overweight employees, 54 percent reported experiences of weight stigma by their fellow employees, and 43 percent reported such experiences by their employer (Puhl and Brownell 2006). This type of workplace discrimination ranges from inappropriate comments and abusive joking to denied promotions and termination (Puhl and Heuer 2009).

Weight bias can also have a negative effect on romantic relationships (Chen and Brown 2005), customer service interactions (King et al. 2006), and the educational environment (e.g., Puhl and Latner 2007). Given the unmistakably harmful impact that weight bias has on the lives of millions of overweight and obese individuals, and the lack of success in reducing obesity itself, social and behavioral scientists should consider it a priority to develop and test effective strategies for eliminating this pervasive bias. Attempts to reduce weight bias have involved providing information about the etiology of obesity or trying to create empathy for the daily struggles of obese people, but these efforts have had mixed results

(e.g., Teachman et al. 2003). It may be the case that using multiple stigma-reduction approaches in concert will be necessary to combat such a strong bias.

Mental Health Consequences

Given the myriad ways in which obese people are discriminated against and stigmatized in our society, it would not be surprising if mental health problems resulted. And because it was thought that obesity was *caused by* psychopathology, many studies explored whether obesity and a variety of mental disorders co-occurred. Thus resulted several decades of cross-sectional studies that were similar in that they included a measure of obesity and a measure of at least one emotional problem, but that varied according to how they defined obesity, and how they defined and measured emotional problems (Friedman and Brownell 1995). In that generation of studies, individuals usually self-reported their weights, and trained clinicians almost never used diagnostic criteria to assess mental disorders, which were often measured with a single self-reported item. Findings from these studies rarely found evidence for the relationship between obesity and psychopathology, but because of the overall inconsistency of the results, it was possible to use them to support whatever conclusion one desired. The majority of reports concluded that obesity was not related to mental illness (see Stunkard and Wadden 1992 for a review), but some suggested that obesity was associated with increases in the prevalence of mental illness, while still others argued, in what became known (rather condescendingly, in our view) as the "jolly fat hypothesis," that obesity was actually related to improvements in emotional health (Crisp and McGuinness 1976).

In more recent years, a number of studies (Hasler et al. 2004; Mather et al. 2009; Onyike et al. 2003; Pickering et al. 2007; Scott et al. 2007; Simon et al. 2006) have addressed this question with carefully attained nationally representative samples and clinical measurement of mental illness. Like the prior generation of research, the results of these studies were inconsistent, with some finding evidence for associations between obesity and increased risk for depression or anxiety, and others finding no significant relationships (or in one case, the opposite: that obesity was associated with a lower risk of anxiety; Hasler et al. 2004). Even when significant associations are found, they tend to be small effects, with odds ratios around 1.3.

The most rigorous tests of the link between obesity and mental illness come from prospective longitudinal studies, and these have focused primarily on depression (Bjerkeset et al. 2008; Herva et al. 2006; Roberts et al. 2000, 2003). These studies measured BMI at baseline and then depression from one to 17 years later. All three found a significant relationship between baseline obesity and increased depression at follow-up, although in the study with the 17-year follow-up, the relationship was found for men, but not women. Importantly, the one prospective study that controlled for baseline depression still found a significant relationship between obesity and later depression (Roberts et al. 2003). In addition, that study also tested the reverse path, and found that baseline depression did not predict later

obesity (controlling for baseline obesity), suggesting, in what appears to be the most rigorous test to date, that the causal direction of the relationship may be obesity preceding depression rather than the reverse.

Considering the findings from the nationally representative cross-sectional studies and the prospective longitudinal studies, it seems that a reasonable conclusion is that obesity does seem associated with later depression, but that this relationship is not particularly strong. Only one prospective study looked at anxiety, and it did not find evidence for a link between obesity and anxiety (Bjerkeset et al. 2008). In general, the evidence for a link between obesity and anxiety seems weaker and more tenuous than that between obesity and depression.

What does seem clear, however, is that regardless of whether obesity causes diagnosable mental disorders, it does have psychological consequences. Research with children and adolescents generally finds that obesity is related to body dissatisfaction (Ricciardelli and McCabe 2001; Wardle and Cooke 2005) and low self-esteem (French, Story, and Perry 1995; Wardle and Cooke 2005). When individuals of all ages and genders are studied, it appears that the relationship between obesity and low self-esteem is stronger in women than in men, gets stronger from childhood through college age, and then starts to weaken (but remains significant) among adults (Miller and Downey 1999).

The relationship between obesity and self-esteem may be mediated by the stigmatizing behaviors of others, such as, among children, weight-related teasing (Davison and Birch 2002; Thompson et al. 1995). It may also be mediated by individuals' own internalization of stigma, such as believing their obesity is entirely under their control (Pierce and Wardle 1997), or by the emotional toll of chronic and repeated diet failures (Miller and Downey 1999).

Physical Health Consequences

It has long been thought that obesity leads to physical health consequences, and the particular ailments attributed to obesity have included cardiovascular disease, strokes, hypertension, many cancers, diabetes, gallstones, chronic renal failure, fatty liver disease, gout, osteoarthritis, migraines, dementia, carpal tunnel syndrome, asthma, infertility, pregnancy complications, polycystic ovaries, erectile dysfunction, hirsutism, sleep apnea, and incontinence (NHLBI Expert Panel 1998). It has not been shown, however, that obesity per se actually causes these ailments, because the primary type of study that can show such causal links cannot be conducted for obesity. That type of study, the randomized controlled trial, is not possible because it requires randomly assigning individuals to either be obese or not obese, and then watching those individuals over the next several decades to see which diseases they contract.

Researchers must settle for the next best form of evidence, prospective longitudinal studies, in which individuals who happen to be obese (or not obese) are observed over many decades. Health differences found between obese and non-obese people in these studies may appear to have been *caused* by obesity, but in fact

may have actually been caused by some additional factor that also varies between obese and non-obese people. It is all too easy for people not versed in research methods to mistakenly assume that such studies are convincing evidence of obesity's causal role in many diseases.

In the last 20 years, scientists (as well as activists and journalists) have begun to explore a variety of confounding factors that may account for the relationship between obesity and physical health problems (Campos et al. 2005). This has led to a contentious and politicized debate (described in Kolata 2007) that is unlikely to be easily resolved. The confounding factors that may play an important role in this relationship are obese people's greater likelihood (than non-obese people) of leading sedentary lifestyles, repeatedly gaining and losing weight (known as "weight cycling"), avoiding health care, and being in lower socioeconomic groups (Campos 2004; Ernsberger and Koletsky 1999). These factors have been shown to be associated with poor health and, to the extent that they are more likely to occur among obese people than non-obese people, may account for the relationship between obesity and disease.

Another factor that muddies the evidence for obesity as a cause of health problems is data suggesting that obesity does not shorten an individual's lifespan, or at least not until extremely high levels of obesity are reached (Flegal et al. 2005). It is difficult (although not impossible) to convincingly argue that obesity causes such a long list of ailments but somehow does not shorten one's life. The evidence is also called into question because studies supporting the relationship between obesity and health outcomes tend to be conducted by researchers with significant conflicts of interest (Fraser 1998).

As researchers with no vested interests on either side of this debate (as we study psychological outcomes of diets and obesity rather than physical ones), we have observed this debate from the outside. It is our conclusion that the links between obesity and some diseases are quite convincing, such as that between obesity and type 2 diabetes (Colditz et al. 1995; Ford, Williamson, and Liu 1997) and osteoarthritis (Hochberg et al. 1995). However, it is equally clear to us that the strength of the links between obesity and many other ailments has been overstated (Olshansky et al. 2005). Even if these relationships cannot be entirely explained away by confounding variables, they do not seem strong enough to warrant the amount of alarm they receive from the media, scientists, and the government.

Treatment of Obesity

Despite imperfect models regarding its etiology, strong beliefs in the physical health consequences of obesity have led researchers to develop treatment interventions. Most of these interventions have been diets designed to promote weight loss. More recent efforts, however, have included interventions aimed at treating the

self-esteem and body dissatisfaction that result from obesity, without necessarily focusing on weight loss.

Treating the Physical Health Consequences of Obesity

Given the field of psychology's long history of research on behavior change, it is not surprising that its approach to the treatment of obesity is to try to alter people's eating habits by teaching them diet strategies. Over the past 60 years, psychologists have studied dozens of behavioral weight loss techniques to see which are effective (Leon 1976; Ayyad and Andersen 2000). They have taught dieters how to select appropriate foods to eat, count calories, resist temptation, monitor how much food they eat, and to reward (or punish) themselves for eating the right (or wrong) amount of food (see Leon 1976 for a review). In some treatments they gave the dieters all the food that they were allowed to eat, and in some cases the dieters were required to do all their eating in a researcher's laboratory or clinic (e.g., Wing and Jeffrey 2001; Musante 1976). Psychologists have also explored the effectiveness of having dieters give some of their own money to researchers and then trying to earn it back by losing certain amounts of weight (e.g., Harris and Bruner 1971). They also tested whether using social pressure could get obese people to reduce their consumption (e.g., Wollersheim 1970). Finally, in efforts to create negative associations with desired foods, researchers have paired dieters' favorite foods with horrible odors, and in other cases have actually jolted obese patients with electric shock whenever they tried to eat a food they craved (e.g., Foreyt and Kennedy 1971; Meyer and Crisp 1964).

As silly (or cruel) as some of these treatments may sound, by and large, whatever psychologists attempted generally led to at least *some* weight loss during the early months of the diet (Jeffery et al. 2000; Perri and Fuller 1995). Across over 200 diet studies conducted from 1966 up until 2000, participants lost from 8 to 22 pounds in as many weeks—about a pound a week (Wing 2002). For a diet to truly be considered successful, however, individuals must not just lose weight in the short term, but they also must keep it off. The majority of diet studies do not follow participants long enough to see if that happened. In fact, only 6 percent of over 800 diet studies found by researchers in the year 2000 had follow-ups of three years or more, and two-thirds of those had such serious flaws that they offered little useful information (Ayyad and Andersen 2000).

Across 14 studies with long-term follow-ups, participants initially lost an average of 30 pounds, but by four or five years later, they had gained back all but 7 of those pounds (Mann et al. 2007). These results likely *inflate* the success of these diets because the studies have multiple sources of systematic bias—all of which make the diets look more successful than they were. For example, most of the people who start these diet studies do not finish them, and the people who do finish are the ones who do the best on the diets. In addition, many of the people in these studies are not actually weighed by the researchers, but rather just tell the researchers their weight over the phone or by mail. Since most people lie about their weight—and

say they weigh less than they actually do—this flaw causes the diets to look like they led to more weight loss than they really did. Another source of systematic bias in these studies is that many of the participants went on additional diets during the long follow-up period. This makes it appear as if the original diet had led to sustained weight loss, when, in fact, these dieters likely gained back a lot—if not all—of the weight before they started a new diet.

If the goal of obesity treatment is to have obese people lose enough weight to make them non-obese, and to maintain that weight loss in the long term, then it seems clear to us that behavioral treatments for obesity are unsuccessful. However, it is the association between obesity and physical health problems that makes effective obesity treatment a high priority in our country's research agenda. Given that, we suggest that it doesn't make sense to use weight loss—an indirect and imperfect measure of health—as a marker of successful obesity treatment when we could be measuring improvements in physical health more directly (Ernsberger and Koletsky 1999). The next generation of obesity treatment research should focus on physical health outcomes such as heart rate, blood pressure, and cholesterol levels, rather than weight change. Indeed, research on exercise interventions show positive health benefits on all of these outcomes, even in the absence of weight loss (Caudwell et al. 2009).

Treating the Mental Health Consequences of Obesity

Early psychological interventions focused on altering eating behavior to the neglect of mental health sequelae. It has even been argued that some mental health consequences of obesity, especially body distress, are important motivators for behavior change and that addressing them would be detrimental to weight-loss efforts. While there has been some support for this, the negative social and psychological effects of body distress and obesity are important areas of concern (Heinberg, Thompson, and Matzon 2001; Schwartz and Brownell 2004; Wilson 1996). Body image and self-acceptance themselves became primary aims of treatment due to the combination of these negative consequences and ineffective long-term weight loss treatments (Wilson 1996; Schwartz and Brownell 2004; Rosen et al. 1995).

It has been assumed that weight loss is a necessary prerequisite for improvement in body image. However, research findings have produced mixed results (see Schwartz and Brownell 2004). A randomized control trial comparing a cognitive behavioral body image therapy (CBT) or a no-treatment condition found that although weight status remained unchanged, individuals who received CBT showed significant improvement in body image as well as improvement in psychological symptoms, self-esteem, overeating, and eating guilt (Rosen et al. 1995). Another study found that the promotion of body and self-acceptance in a non-diet wellness intervention improved not only body image, but also physical health parameters, without changes in weight (Bacon et al. 2002). These positive psychological and health outcomes were sustained at a two-year follow-up, whereas initial improvements in the diet group were generally not maintained (Bacon et al. 2005). In contrast,

a study comparing a combined body image treatment and weight control program to a weight control program alone did not find any additional improvement in body image (Ramirez and Rosen 2001).

In addition to being targets of treatment, body image and weight acceptance may also promote successful weight maintenance after weight loss occurs. A cognitive behavioral therapy intervention for obesity created by Cooper and Fairburn (2001) encourages a shift from weight loss to acceptance of weight stability following a pre-set period of time. Such promotion of weight- and self-acceptance is thought to prevent psychological barriers, including focusing on unattainable weight loss, from interfering with weight maintenance. In support of this, satisfaction with body weight has been associated with improved maintenance of weight loss, but findings have been inconsistent and more research is needed (Foster et al. 2004; Byrne, Cooper, and Fairburn 2004; Ames et al. 2005; Gorin et al. 2007).

Targeting body image dissatisfaction and self-acceptance either in isolation or in conjunction with behavior change therapy aimed at weight loss appears to be a promising component of treatment. While continued research is needed to explore the effects of these treatments, it is clear that the mental health consequences of obesity should not take a back seat to treatments aimed solely at the physical health consequences.

Conclusion

In 1999, psychologists, nutritionists, and other experts proposed a paradigm shift in research and policy on dieting and obesity (Cogan and Ernsberger. 1999). They suggested a health-centered, rather than a weight-centered approach to obesity. This approach would encourage obesity researchers to design their interventions with the goal of promoting fitness rather than weight loss, and to use health markers as their outcome variables, rather than relying on weight as the primary and critical measure of success. Work consistent with this approach is accumulating, and although the proposed shift has not occurred, we believe that it would be a positive direction for the field. It seems to us that even though interventions based on this new paradigm may not reduce the prevalence of obesity, they are likely to improve the nation's health, and by helping to unlink the association between obesity and illness, may even reduce the stigma of obesity.

REFERENCES

Ames, G. E., M. G. Perri, L. D. Fox, E. A. Fallon, N. De Braganza, M. E. Murawski, et al. 2005. "Changing Weight-Loss Expectations: A Randomized Pilot Study." *Eating Behaviors* 6: 259–269.

Ayyad, C., and T. Andersen. 2000. "Long-term Efficacy of Dietary Treatment of Obesity: A Systematic Review of Studies Published between 1931 and 1999." *Obesity Reviews* 1: 113–119.

Bacon, L., N. L. Keim, M. D. Van Loan, M. Derricote, B. Gale, A. Kazaks, and J. S. Stern. 2002. "Evaluating a 'Non-Diet' Wellness Intervention for Improvement of Metabolic Fitness, Psychological Well-Being and Eating and Activity Behaviors." *International Journal of Obesity* 26: 854–865.

Bacon, L., J. S. Stern, M. D. Van Loan, and N. L. Keim. 2005. "Size Acceptance and Intuitive Eating Improve Health for Obese, Female Chronic Dieters." *Journal of the American Dietetic Association* 105: 929–936.

Bjerkeset, O., P. Romundstad, J. Evans, and D. Gunnell. 2008. "Association of Adult Body Mass Index and Height with Anxiety, Depression, and Suicide in the General Population." *American Journal of Epidemiology* 167: 193–202.

Bruch, H. 1961. "The Transformation of Oral Impulses in Eating Disorders: A Conceptual Approach." *Psychiatric Quarterly* 35: 458–481.

Byrne, S. M., Z. Cooper, and C. G. Fairburn. 2004. "Psychological Predictors of Weight Regain in Obesity." *Behaviour Research and Therapy* 42: 1341–1356.

Brownell, Kelly. 2005. "The Social, Scientific, and Human Context of Prejudice and Discrimination Based on Weight." In *Weight bias: Nature, Consequences, and Remedies*, ed. Kelly Brownell, Rebecca Puhl, Marlene Schwartz, and Leslie Rudd, 1–11. New York: Guilford Press.

Campos, P. 2004. *The Obesity Myth*. New York: Gotham.

Campos, P., A. Saguy, P. Ernsberger, E. Oliver, and G. Gaesser. 2005. "The Epidemiology of Overweight and Obesity: Public Health Crisis or Moral Panic?" *International Journal of Epidemiology* 35: 55–60.

Canetti, L., E. Bachar, and E. M. Berry. 2002. "Food and Emotion." *Behavioural Processes* 60: 157–164.

Carper, J. L., J. O. Fisher, and L. L. Birch. 2000. "Young Girls' Emerging Dietary Restraint and Disinhibtion Are Related to Parental Control in Child Feeding." *Appetite* 35: 121–129.

Caudwell, P., M. Hopkins, N. A. King, R. J. Stubbs, and J. E. Blundell. 2009. "Exercise Alone Is Not Enough: Weight Loss Also Needs a Healthy (Mediterranean) Diet?" *Public Health Nutrition* 12: 1663–1666.

Chen, E., and M. Brown. 2005. "Obesity Stigma in Sexual Relationships." *Obesity Research* 13: 1393–1397.

Christakis, N. A., and J. H. Fowler. 2007. "The Spread of Obesity in a Large Social Network over 32 Years." *The New England Journal of Medicine* 357: 370–379.

Cogan, J. C., and P. Ernsberger. 1999. "Dieting, Weight, and Health: Reconceptualizing Research and Policy." *Journal of Social Issues* 55: 187–205.

Cohen-Cole, E., and J. M. Fletcher. 2008. "Detecting Implausible Social Network Effects in Acne, Height, and Headaches: Longitudinal Analysis." *British Medical Journal* 337: a2533.

Colditz G. A., W. C. Willett, A. Rotnitzky, and J. E. Manson. 1995. "Weight Gain as a Risk Factor for Clinical Diabetes Mellitus in Women." *Annals of Internal Medicine* 122: 481–486.

Cooper, Z., and C. G. Fairburn. 2001. "A New Cognitive Behavioural Approach to the Treatment of Obesity." *Behaviour Research and Therapy* 39: 499–511.

Crisp, A. H., and B. McGuinness. 1976. "Jolly Fat: Relation between Obesity and Psychoneurosis in the General Population." *British Medical Journal* 1: 7–9.

Cutting, T.M., J.O Fisher, K. Grimm-Thomas, and L.L. Birch. 1999. "Like Mother, Like Daughter: Familial Patterns of Overweight Are Mediated by Mothers' Dietary Disinhibtion." *American Journal of Clinical Nutrition* 69: 608–613.

Davison, K. K., and L. L. Birch. 2002. "Processes Linking Weight Status and Self-Concept among Girls from Ages 5 To 7 Years." *Developmental Psychology* 38: 735–748.

Drury, C., and M. Louis, M. 2002. "Exploring the Association between Body Weight, Stigma of Obesity, and Health Care Avoidance." *Journal of American Academy of Nurse Practitioners* 14: 554–560.

Epstein, L. H., R. R. Wing, and A. Valoski. 1985. "Childhood Obesity." *Pediatric Clinics of North America* 32(2): 363–379.

Ernsberger, P., and R. J. Koletsky. 1999. "Biomedical Rationale for a Wellness Approach to Obesity: An Alternative to a Focus on Weight Loss." *Journal of Social Issues* 55: 221–259.

Flegal, K., B. I. Graubard, D. F. Williamson, and M. H. Gail. 2005. "Excess Deaths Associated with Underweight, Overweight, and Obesity." *Journal of the American Medical Association* 293: 1861–1867.

Ford, E. S., D. F. Williamson, and S. Liu. 1997. "Weight Change and Diabetes Incidence: Findings from a National Cohort of US Adults." *American Journal of Epidemiology* 146: 214–222.

Foreyt, J. P., and W. A. Kennedy. 1971. "Treatment of Overweight by Aversion Therapy." *Behaviour Research and Therapy,* 9: 29–34.

Foster, G. D., S. Phelan, T. A. Wadden, D. Gill, J. Ermold, and E. Didie. 2004. "Promoting More Modest Weight Losses: A Pilot Study." *Obesity* 12: 1271–1277.

Foster, G. D., T. A.Wadden, A. P. Makris, D. Davidson, R. S. Sanderson, D. B. Allison, and A. Kessler. 2003. "Primary Care Physicians' Attitudes about Obesity and Its Treatment." *Obesity Research* 11: 1168–1177.

Francis, L. A., and L. L. Birch. 2005. "Maternal Influences on Daughters' Restrained Eating Behavior." *Health Psychology* 24: 548–554.

Fraser, L. 1998. *Losing It: False Hopes and Fat Profits in the Diet Industry*. New York: Plume.

French, S. A., M. Story, and C. L. Perry. 1995. "Self-esteem and Obesity in Children and Adolescents: A Literature Review." *Obesity Research* 3: 479–490.

Friedman, M. A., and K. D. Brownell. 1995. "Psychological Correlates of Obesity: Moving to the Next Research Generation." *Psychological Bulletin* 117: 3–20.

Gorin, A. A., A. Marinilli Pinto, D. F. Tate, H. A. Raynor, J. L. Fava, and R. R.Wing. 2007. "Failure to Meet Weight Loss Expectations Does Not Impact Maintenance in Successful Weight Losers." *Obesity* 15: 3086–3090.

Greeno, C. G., and R. R. Wing. 1994. "Stress-induced Eating." *Psychological Bulletin* 115: 444–464.

Harris, M. B., and C. G. Bruner. 1971. "A Comparison of a Self-Control and a Contract Procedure for Weight Control." *Behavior Research and Therapy* 9: 347–354.

Hasler, G., D. S. Pine, A. Gamma, G. Milos, V. Ajdacic, D. Eich, W. Rossler, and J. Angst. 2004. "The Associations between Psychopathology and Being Overweight: A 20-Year Prospective Study." *Psychological Medicine* 34: 1047–1057.

Hatzenbuehler, M. L., K. M. Keyes, and D. S. Hasin. 2009. "Associations between Perceived Weight Discrimination and the Prevalence of Psychiatric Disorders in the General Population." *Obesity* 17: 2033–2039.

Heatherton, T. F., C. P. Herman, and J. Polivy. 1991. "Effects of Physical Threat and Ego Threat on Eating Behavior." *Journal of Personality and Social Psychology* 60: 138–143.

Heinberg, L. J., J. K. Thompson, and J. L. Matzon. 2001. "Body Image Dissatisfaction as a Motivator for Healthy Lifestyle Change: Is Some Distress Beneficial?" In *Eating Disorders: Innovative Directions in Research and Practice*, eds. R. H. Striegel-Moore and L. Smolak. Washington, DC: American Psychological Association.

Herman, C. P., and D. Mack. 1975. "Restrained and Unrestrained Eating." *Journal of Personality* 43(4): 647–660.

Herman, C. P., and J. Polivy. 1975. "Anxiety, Restraint, and Eating Behavior." *Journal of Abnormal Psychology* 84: 666–672.

Herman, C. P., and J. Polivy. 2008. "External Cues in the Control of Food Intake in Humans: The Sensory-Normative Distinction." *Physiology and Behavior* 94: 722–728.

Herva, A., J. Laitinen, J. Miettunen, J. Veijola, J. T. Karvonen, K. Lasky, et al. 2006. "Obesity and Depression: Results from the Longitudinal Northern Finland 1966 Birth Cohort Study." *International Journal of Obesity (London)* 30: 520–527.

Hochberg, M. C., M. Lethbridge-Cejku, W. W. Scott, R. Reichle, C. C. Plato, and J. D. Tobin. 1995. "The Association of Body Weight, Body Fatness and Body Fat Distribution with Osteoarthritis of the Knee: Data from the Baltimore Longitudinal Study of Aging." *Journal of Rheumatology* 22: 488–493.

Greenfield, E. A., and N. F. Marks. 2009. "Violence from Parents in Childhood and Obesity in Adulthood: Using Food in Response to Stress as a Mediator of Risk." *Social Science and Medicine* 68: 791–798.

Jeffery, R. W., A. Drewnowski, L. H. Epstein, A. J. Stunkard, G. T. Wilson, R. R. Wing, et al. 2000. "Long-term Maintenance of Weight Loss: Current Status." *Heath Psychology* 19(Supp.): 5–6.

Kaplan, H. I., and H. S. Kaplan. 1957. "The Psychosomatic Concept of Obesity." *Journal of Nervous and Mental Disease* 125: 181–201.

King, E. B., J. R. Shapiro, M. R. Hebl, S. L. Singletary, and S. Turner. 2006. "The Stigma of Obesity in Customer Service: A Mechanism for Remediation and Bottom-Line Consequences of Interpersonal Discrimination." *Journal of Applied Psychology* 91: 579–593.

Koch, F.S., A. Sepa, and J. Ludvigsson. 2008. "Psychological Stress and Obesity." *The Journal of Pediatrics* 153: 839–844.

Kolata, Gina. 2007. *Rethinking Thin.* New York: Farrar Straus and Giroux.

Leon, Gloria R. 1976. "Current Directions in the Treatment of Obesity." *Psychological Bulletin* 83: 557–578.

Lowe, M. R., J. van Steenburgh, C. Ochner,, and M. Coletta. 2009. "Neural Correlates of Individual Differences Related to Appetite." *Physiology and Behavior* 97: 561–571.

Macht, M., and J. Mueller. 2007. "Immediate Effects of Chocolate on Experimentally Induced Mood States." *Appetite* 49: 667–674.

Maclean, L., N. Edwards, M. Garrard, N. Sims-Jones, K. Clinton, and L. Ashley. 2009. "Obesity, Stigma and Public Health Planning." *Health Promotion International* 24: 88–93.

Mann, T., A. J. Tomiyama, E. Westling, A. Lew, B. Samuels, and J. Chatman. 2007. "Medicare's Search for Effective Obesity Treatments: Diets Are Not the Answer." *American Psychologist* 62: 220–233.

Mann, T., and A. Ward. 2000. "Don't Mind If I Do: Disinhibited Eating under Cognitive Load." *Journal of Personality and Social Psychology* 78(4): 753–763.

Mather, A. A., B. J. Cox, W. E. Murray, and J. Sareen. 2009. "Associations of Obesity with Psychiatric Disorders and Suicidal Behaviors in a Nationally Representative Sample." *Journal of Psychosomatic Research* 66: 277–285.

Meyer, V., and A. H. Crisp. 1964. "Aversion Therapy in Two Cases of Obesity." *Behaviour Research and Therapy* 2: 143–147.

Miller, C. T., and K. T. Downey. 1999. "A Meta-Analysis of Heavyweight and Self-Esteem." *Personality and Social Psychology Review* 3: 68–84.

Musante, G. J. 1976. "The Dietary Rehabilitation Clinic: Evaluative Report of a Behavioral and Dietary Treatment of Obesity." *Behavior Therapy* 7: 198–204.

NHLBI Expert Panel. 1998. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report*. NIH Publication Number 98–4083.

Nisbett, R. E. 1972. "Hunger, Obesity, and the Ventromedial Hypothalamus." *Psychological Review* 79(6): 433–453.

Nosek, B. A., Banaji, M., and A. G. Greenwald. 2002. "Harvesting Implicit Group Attitudes and Beliefs from a Demonstration Web Site." *Group Dynamics: Theory, Research, and Practice*, 6: 101–115.

Onyike, C. U., R. M. Crum, H. B. Lee, C. G. Lyketsos, and W. W. Eaton. 2003. "Is Obesity Associated with Major Depression? Results from the Third National Health and Nutrition Examination Survey." *American Journal of Epidemiology* 158: 1139–1147.

Olshansky, S. J., D. J. Passaro, R. C. Hershow, et al. 2005. "A Potential Decline in Life Expectancy in the United States in the 21st Century." *New England Journal of Medicine* 352: 1138–1145.

Perri, M. G., and P. R. Fuller. 1995. "Success and Failure in the Treatment Of Obesity: Where Do We Go from Here?" *Medicine, Exercise, Nutrition, and Health* 4: 255–272.

Pickering, R. P., B. F. Grant, S. P. Chou, et al. 2007. "Are Overweight, Obesity, and Extreme Obesity Associated with Psychopathology? Results from the National Epidemiologic Survey on Alcohol and Related Conditions." *Journal of Clinical Psychology* 68: 998–1009.

Pierce, J. W., and J. Wardle. 1997. "Cause and Effect Beliefs and Self-Esteem of Overweight Children." *Journal of Child Psychology and Psychiatry* 38: 645–650.

Pike, K. M., and J. Rodin. 1991. "Mothers, Daughters, and Disordered Eating." *Journal of Abnormal Psychology* 100: 198–204.

Pinel, J. P. J., S. Assanand, and D. R. Lehman. 2000. "Hunger, Eating and Ill Health." *American Psychologist* 55(10): 1105–1116.

Polinko, N. K., and P. M. Popovich. 2001. "Evil Thoughts but Angelic Actions: Responses to Overweight Job Applicants." *Journal of Applied Social Psychology* 31: 905–924.

Polivy, J., and C. P. Herman. 1985. "Dieting and Binging: A Causal Analysis." *American Psychologist* 40: 193–201.

Polivy, J., C. P. Herman, and T. McFarlane. (1994). "Effects of Anxiety on Eating: Does Palatability Moderate Distress-Induced Overeating in Dieters?" *Journal of Abnormal Psychology* 103: 505–510.

Puhl, R. M., T. Andreyeva, and K. D.Brownell. 2008. "Perceptions of Weight Discrimination: Prevalence and Comparison to Race and Gender Discrimination in America." *International Journal of Obesity* 32: 992–1000.

Puhl, R. M., and J. D. Latner. 2007. "Obesity, Stigma, and the Health of the Nation's Children." *Psychological Bulletin* 133: 557–580.

Puhl, R. M., and K. D.Brownell. 2006. "Confronting and Coping with Weight Stigma: An Investigation of Overweight and Obese Individuals." *Obesity* 14: 1802–1815.

Puhl, R. M., and C. A. Heuer. 2009. "The Stigma of Obesity: A Review and Update." *Obesity* 17: 941–964.

Ramirez, E. M., and J. C. Rosen. 2001. "A Comparison of Weight Control and Weight Control Plus Body Image Therapy for Obese Men and Women." *Journal of Consulting and Clinical Psychology* 69: 440–446.

Ricciardelli, L. A., and M. P. McCabe. 2001. "Children's Body Image Concerns and Eating Disturbance: A Review of the Literature." *Clinical Psychology Review* 21: 325–344.

Roberts, R. E., G. A. Kaplan, S. J. Shema, and W. J. Strawbridge. 2000. "Are the Obese at Greater Risk for Depression?" *American Journal of Epidemiology* 152: 163–170.

Roberts, R. E., S. Deleger, W. J. Strawbridge, and G. A. Kaplan. 2003. "Prospective Association between Obesity and Depression: Evidence from the Alameda County Study." *International Journal of Obesity and Related Metabolic Disorders* 27: 514–521.

Roehling, Mark V., Shawn Pilcher, Fred Oswald, and Tamara A. Bruce. (2008). "The Effects of Weight Bias on Job-Related Outcomes: A Meta-Analysis of Experimental Studies." Paper presented at the annual meeting of the Academy of Management in Anaheim, CA, 2008.

Rodin, J. 1981. "Current Status of the Internal-External Hypothesis for Obesity: What Went Wrong?" *American Psychologist* 36: 361–372.

Rosen, J. C., P. Orosan, and J. Reiter. 1995. "Cognitive Behavior Therapy for Negative Body Image in Obese Women." *Behavior Therapy* 26: 25–42.

Ruderman, A. J. 1986. "Dietary Restraint: A Theoretical and Empirical Review." *Psychological Bulletin* 99: 247–262.

Schacter, S. 1968. "Obesity and Eating." *Science* 16: 751–756.

Schacter, S., R. Goldman, and A. Gordon. 1968. "Effects of Fear, Food Deprivation, and Obesity on Eating." *Journal of Personality and Social Psychology* 10:96–106.

Schwartz, M. B., and K. D. Brownell. 2004. "Obesity and Body Image." *Body Image* 1: 43–56.

Scott, K. M., R. Bruffaerts, G. E. Simon, J. Alonso, M. Angermeyer, G. de Girolamo, et al. 2007. "Obesity and Mental Disorders in the General Population: Results from the World Mental Health Surveys." *International Journal of Obesity* 32: 192–200.

Simon, G. E., M. Von Korff, K. Saunders, D. L. Miglioretti, P. K. Crane, G. van Belle, et al. 2006. "Association between Obesity and Psychiatric Disorders in the US Adult Population." *Archives of General Psychiatry* 63: 824–830.

Stunkard, A. J., and T. A. Wadden. 1992. "Psychological Aspects of Severe Obesity." *American Journal of Clinical Nutrition* 55: 524S–532S.

Teachman, B. A., K. D. Gapinski, K. D. Brownell, M. Rawlins, and S. Jeyaram. 2003. "Demonstrations of Implicit Anti-Fat Bias: The Impact of Providing Causal Information and Evoking Empathy." *Health Psychology* 22: 68–78.

Thompson, J. K., M. Coovert, K J. Richards, S. Johnson, and J. Cattarin. 1995. "Development of Body Image and Eating Disturbance in Young Females: Covariance Structure Modeling and Longitudinal Analyses." *International Journal of Eating Disorders* 18: 221–236.

Valente, T. W., K. Fujimoto, C. Chou, and D. Spruijt-Metz. 2009. "Adolescent Affiliations and Adiposity: A Social Network Analysis of Friendships and Obesity." *Journal of Adolescent Health* 45: 202–204.

Van Strien, T., and M. A. Ouwens. 2003. "Counterregulatio in Female Obese Eaters: Schacter, Goldman and Gordons (1968) Test of Psychosomatic Theory Revisited." *Eating Behaviors* 3: 329–340.

Wardle, J., and L. Cooke. 2005. "The Impact of Obesity on Psychological Well-Being." *Best Practice and Research Clinical Endocrinology and Metabolism* 19: 421–440.

Wear, D., J. M. Aultman, J. D. Varley, and J. Zarconi. 2006. "Making Fun of Patients: Medical Students' Perceptions and Use of Derogatory and Cynical Humor in Clinical Settings." *Academy of Medicine* 81: 454–462.

Wilson, T. G. 1996. "Acceptance and Change in the Treatment of Eating Disorders and Obesity." *Behavior Therapy* 27: 417–439.

Wing, Rena R. 2002. "Behavioral Weight Control." In *Handbook of Obesity Treatment*, ed. Thomas A. Wadden and Albert J. Stunkard, 301–316. New York: The Guilford Press.

Wing, R. R., and R. W. Jeffrey. 2001. "Food Provision as a Strategy to Promote Weight Loss." *Obesity Research* 9: s271–s275.

Wollersheim, J. P. 1970. "Effectiveness of Group Therapy Based upon Learning Principles in the Treatment of Overweight Women." *Journal of Abnormal Psychology* 76: 462–474.