

# Psychosocial origins of obesity stigma: toward changing a powerful and pervasive bias

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## Summary

Widespread bias and discrimination based on weight have been documented in key areas of living, including education, employment, and health care. This paper examines the social and psychological origins of this bias through a review and critique of theoretical and empirical literatures, and proposes how the field might best advance in the area of reducing stigma. Explanations for the development and reduction of weight stigma are examined with different theoretical approaches, including attribution theory and a social consensus model. Individual and sociocultural contributors to bias suggested by these approaches are highlighted. New directions are discussed in both the understanding and prevention of weight bias.

**Keywords:** Obesity, weight, stigma bias.

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## Introduction

A thorough understanding of weight stigma and its impact may be important to document the social and psychological consequences of obesity, and may be central to revealing the totality of effects of excess weight on health and well-being. Those most exposed to stigma, for instance, may be vulnerable to psychological effects such as depression and social effects such as economic hardship and isolation, which in turn may link obesity with a health outcome like heart disease. Consequences of bias such as isolation or social withdrawal could contribute to the exacerbation of obesity through psychological vulnerabilities that increase the likelihood of over-eating and sedentary activity. While such links with health can only be postulated at present, it is clear that bias, prejudice, and discrimination are part of everyday life for overweight individuals. This has real effects on real people and merits further attention.

A stigmatized person possesses 'some attribute, or characteristic, that conveys a social identity that is devalued in some particular social context' (1). Such individuals are ascribed deviant labels and face negative effects from discrimination and prejudice (2).

The stigma of obesity is very strong. Individuals will go to great lengths to prevent weight gain, and the possibility of becoming obese is considered a disastrous outcome. One survey reported that 24% of women and 17% of men said they would give up three or more years of their lives to be the weight they want; some women reported that they were choosing not to become pregnant because of fears of fatness (3). Others assume the enormous risk of smoking cigarettes in hopes of remaining slim. These examples highlight ideals of thinness in North American society where the message that it is good to be thin and bad to be fat is so widespread that expressing negative attitudes toward obese people has become an accepted form of prejudice (4,5).

Research on weight stigma is relatively new, but is robust enough to show that this bias is powerful, pervasive, and difficult to change. Yet, many key questions are unanswered. As one example, it is not yet known whether the frequency and severity of stigmatization increase with body weight.

The terms 'obesity' and 'overweight' are frequently used interchangeably to describe the condition of excess weight, but in a health context are distinguished using body mass index (BMI) definitions. Although this distinction is impor-

tant for identifying health risks, it is less apparent whether BMI cutoffs are meaningful with respect to stigma and bias resulting from excess weight. Because of the limited work that has documented associations between more frequent exposure to stigmatization and more severe obesity (6), we refer to obesity throughout this review to describe the condition of having excess weight rather than representing a specific BMI cutoff.

Through a review and evaluation of existing theoretical and empirical literature, this paper examines reasons for the stigma of obese individuals as well as ways to reduce bias. Two theoretical approaches are examined: attribution theory and a social consensus model. Attribution theory is the most empirically driven conceptualization of stigma, while social consensus theory suggests a new method of reducing weight stigma. In addition, this paper highlights key conceptual questions and proposes steps to advance both theory and the development of stigma reduction approaches.

### Background on weight stigma

There is clear evidence of stigmatization of obese people in multiple domains (7). Both laboratory and field studies show that obese individuals are less likely to be hired than thin people, even with identical qualifications (8). Negative perceptions of obese persons exist in employment settings where obese employees are viewed as less competent, lazy, and lacking in self-discipline (9). These attitudes have a negative impact on wages, promotions and decisions about employment status (10–13).

Weight stigma also exists in health care settings, where negative attitudes about overweight patients have been reported by physicians, nurses, psychologists, and medical students (14–18). It is even the case that health care professionals specializing in the treatment of obesity hold negative attitudes (19). It is not known whether such biases seen in health care professionals influence the quality of care they provide to obese patients, but studies showing reluctance among obese patients to seek medical care (20,21) and reports by physicians of questionable practices with obese patients (17,22) indicate that this is an important issue.

Educational discrimination is also a key issue. Beginning with harassment and rejection from peers at school to negative teacher attitudes, lower college acceptances, and wrongful dismissals from college (23–25), there are numerous obstacles facing obese students. One study reported that parents of overweight children provided them with less financial support for college than parents of thin children, regardless of factors like family size, income, and education (26). This supports other work demonstrating that parents hold negative stereotypes about overweight, which they communicate to their children (27), and which may have

serious emotional and health consequences for overweight youngsters.

A further indication of the severity of obesity stigma is the young age at which negative attitudes become evident. One study documented weight prejudice in 3–5-year-old pre-school children who judged an overweight child to be more mean and an undesirable playmate compared to an average weight child who was ascribed positive attributes (28). Other work similarly found negative attributions among children as young as age 3 who associated overweight with being mean, stupid, ugly, unhappy, lazy, and having few friends (29). Kraig & Keel examined weight-based stigma among 7–9-year-olds, and found that ratings were most favourable for illustrations of thin children and least favourable for chubby children, regardless of children's own weight (30). Other work shows that elementary school age children believe obese children are ugly, selfish, lazy, stupid, have few friends, lie and get teased, whereas average weight targets are considered clever, healthy, attractive, kind, happy, have more friends, and are a desirable playmate (31). Perhaps most commonly cited is research where school children have ranked obese children last among children with crutches, in a wheelchair, with an amputated hand, and with a facial disfigurement in terms of who they would most like for a friend (32). This classic study by Richardson and colleagues is now more than 40 years old. With the prevalence of obesity so much higher now, and with greater exposure to obese persons in everyday life, one could speculate that the stigma would be diminished. Latner & Stunkard recently replicated the Richardson study and found that the bias in children is even stronger than reported in the original study (33).

There are many manifestations of negative attitudes, including the way overweight people are portrayed in the media. As examples, fat jokes are common on television, overweight characters can be cast in very negative ways in movies, and children's cartoons can ridicule characters who are overweight. A recent study, for instance, did a detailed examination of 1018 major characters in the most popular television shows for the six major broadcast networks (34). Overweight characters, especially females, appeared far less than their representation in the population, and were more likely than thin characters to be the objects of humour and less likely to be shown in romantic relationships.

It is important to acknowledge that obese individuals face several layers of bias. For example, it has been documented that obesity is more prevalent among lower socioeconomic groups. Sobal & Stunkard's (1989) review of 144 published studies demonstrated that persons of lower socioeconomic status (SES) are at increased risk of obesity across industrialized nations, and that this pattern is more consistent for obese women than men (35). More recent studies reveal that SES has a linear relationship with obesity (36,37). Factors such as health-related behaviours or access

to health care common to both obesity and SES complicate the direction of causality in this relationship.

Some research has also revealed a possible association between obesity and lower intelligence, suggesting that obese individuals may be at an intellectual disadvantage compared to non-obese persons (38–42). Because most studies are correlational, there are numerous extraneous variables (such as social class) that could account for poorer educational attainment in some obese persons.

These associations have several possible explanations. One is that obese people are in lower social classes or perform poorly in life activities such as education because of actual deficits in intellectual or work-related skills. Little research has addressed this hypothesis. Given the strong bias toward obese people, a plausible explanation is that obese individuals are treated as if they are deficient because of weight stigma, which gets enacted in prejudice and discrimination. For example, educators can hold negative anti-fat attitudes that may affect perceptions of performance among obese students (43). Self-fulfilling prophecies then may occur in which obese individuals behave in ways consistent with stereotypes. Some work indicates that weight bias occurs irrespective of an individual's own body weight, and that overweight people themselves tend to express bias (19,43–45). Other work indicates that some overweight people have negative weight attitudes and react to stigma by applying negative stereotypes to themselves (46). In order to determine the reasons for social disadvantages of obesity, more research is needed to examine whether variables like SES or intellectual performance become associated with obesity because of a potential common genetic or environmental link, or whether these consequences are created by stigma.

Taken together, research documents a widely held perception that overweight people have multiple negative characteristics, ranging from flaws in personal effort (such as poor self-discipline or laziness), to central attributes of competence, attractiveness, and morality (7,47).

Less work has examined why this population has become increasingly derogated, and why it is socially acceptable to hold negative stereotypes about obese individuals. Documenting the prevalence and impact of discrimination and prejudice is only a start. Identification and testing of theories to explain the underlying causes of this bias is necessary to advance our understanding of this topic and to guide stigma reduction efforts.

Understanding the social and psychological origins of weight stigma is important because of the strength of existing bias, its apparent resistance to change (47), and the vast numbers of people who are overweight and hence subject to bias, prejudice and discrimination. Research in other areas has shown negative effects of bias and discrimination on the health and well-being of those targeted (48,49). With obesity a disease of major public health significance,

now exceeding smoking in health care costs (50), the fact that many possible links exist between weight bias and poor health make work in this area a priority. Given pervasive negative attitudes, it is not surprising that obesity is also associated with increased likelihood of depression, suicidal thoughts, and suicide attempts (51). It is critical for researchers and health care professionals in the obesity field to understand the origins of this bias and to take steps to improve attitudes toward this population.

## Understanding the origins of weight stigma

This paper offers a critique of existing theories that aim to explain weight stigma and of ways to reduce bias against obese individuals. To advance the field, a theory should help address central issues such as the origins of weight stigma, social context variables, why stigma is elicited by obesity vs. other body types, and why social values of body weight vary over time and across cultures. A theory should explain individual differences and account for the stereotypical traits that obese persons are presumed to have. Although much existing research reflects early theoretical development, we review this literature in consideration of the above conceptual topics, identify testable hypotheses for each, and discuss how future studies can test theories while opening the door to bias reduction.

## A psychological attribution framework

Attribution theory suggests that people attempt to search for information that determines the causes of uncertain outcomes. When approaching a person with a stigmatized condition like obesity, people search for its cause and in turn form their reactions to the obese person (52). Stigmas therefore are representations of society's negative perceptions about particular groups. This knowledge is used to categorize information about social groups and to form impressions and expectations of individuals (53). The attribution approach has received the most empirical attention in the weight bias arena.

Crandall and colleagues have proposed that obesity stigma results from a social ideology that uses negative attributions to explain negative life outcomes. They argue that traditional conservative American values of self-determination and individualism provide a foundation for anti-fat attitudes (54,55), where people get what they deserve and are responsible for their life situation (56). This notion closely resembles a Protestant work ethic that emphasizes internal control and self-discipline (57). The condition of another person's life, including weight, is blamed on internal, controllable causes (55).

Although empirical evidence suggests that body weight is determined by a complex interaction of biological and environmental factors (58), there are widespread percep-

tions that obese individuals are responsible for being overweight, that weight gain or loss is under personal control (7), and that obesity is associated with laziness and low self-discipline, which may reinforce beliefs that the cause of obesity is a result of out-of-control impulses and behaviour (8,59). Thus, it appears that this bias remains strong even in the face of a large prevalence of obese adults and children, and despite contradictory research evidence that demonstrates the limited success of long-term weight loss.

Crandall proposes that attributions of controllability result in negative attitudes and stigma toward disadvantaged out-groups who are perceived to be responsible for their fates. Crandall & Martinez note, 'holding anti-fat attitudes serves a symbolic, or value expressive function . . . among white North Americans, reinforcing a world view consistent with a belief in a just world, self-determination, the Protestant work ethic, self-contained individualism, and the notion that people get what they deserve' (p. 1166) (56). If a person believes that obese people are responsible for their fatness, s/he will blame and stigmatize them (54,57).

There is considerable research on the attribution perspective. It focuses to some extent on the role of affect and expectancy in determining attributions of future behaviours, achievement, and causes of outcomes (60). Specifically, attributions involving ideological conservatism, just world beliefs, and perceptions of causality and controllability are thought to be the core components underlying stigma of obese individuals, all of which place blame and responsibility for the stigma on the obese individual. Crandall labels these attributions as 'justification ideologies', which represent untested beliefs that promote and justify stigma while also removing feelings of guilt for discriminatory behaviour and biased attitudes (61). Individuals are committed to their world views, and challenges will result in reactions of self-justification and rejection of those who challenge them (61). These core attributions provide a way for individuals to stigmatize others with less guilt, which may be one reason why the stigma toward obese people remains so widespread.

#### *Research on attributions of blame and weight stigma*

The notion that people get what they deserve in life is central to attributional explanations of weight stigma. The Protestant work ethic and 'just world bias' are two related phenomena. The Protestant work ethic depicts beliefs that hard work and determination lead to success, thus placing high value on self-control and blaming victims for not succeeding (54). Studies show associations between a Protestant work ethic and various prejudices (62,63). Traditional conservative American values consisting of rigid and authoritarian ideologies reflect similar thinking about the world, as both place responsibility on others for what happens to them (44). In a series of survey studies exam-

ining components of weight prejudice, clear patterns emerge between rejection of fat persons and a social ideology of blame; anti-fat attitudes are positively correlated with political conservatism, symbolic racism, authoritarianism, and the tendency to blame economically disadvantaged persons for their poverty (54).

Crandall & Biernat found that young adults who expressed negative attitudes toward obese people also expressed authoritarianism and political conservatism, including attitudes favouring traditional sex roles and capital punishment. Personal weight status had no relationship to negative attitudes (44).

These values are clear from the finding that overweight daughters receive less parental financial support for college than thin daughters (26,64). Two studies demonstrated that overweight females, but not males, received less family support for education than normal weight females, after controlling for multiple variables including family income, race, number of children in school, and family size. Parental political attitudes that individuals are responsible for their fates best discriminated between differential treatment of daughters (26). Additional data from senior high school students indicated that body weight had no relationship to college admissions, the desire to attend university, or academic performance at college. With no evidence to indicate a lack of ability to provide financial support by parents, or that being overweight is somehow related to academic potential, the role of parental bias becomes clearer. Crandall suggests that parental attributions of responsibility and blame produce negative emotional responses and consequently affect support of their own children (26).

The 'just world bias' also portrays the world as a predictable environment in which personal effort and ability lead to desired outcomes (65,66). These beliefs are associated with a positive bias toward people who succeed and blame for those who do not (66). The tendency to associate positive qualities with physical attributes may be related to just world beliefs (65). The beliefs increase respect for physically attractive people, who are ascribed positive qualities, and decreases liking for others. This notion is supported by findings that believers in a just world relied on physical attractiveness in making attributional judgements of people whereas non-believers did not use attractiveness for judgements (65).

Other research supports the 'beautiful is good' stereotype in which physically attractive people are ascribed more positive qualities than unattractive individuals, perhaps because of observations of attractive individuals in one's environment and exposure to cultural portrayals of attractiveness and unattractiveness (67). A meta-analysis indicated a moderate effect for the stereotype where more desirable personality characteristics and successful life outcomes were attributed to attractive than to unattractive individuals (67). In addition, the influence of physical

attractiveness was strongest for social competence, suggesting that variables like sociability and popularity are central components of the attractiveness stereotype (67). Additional research is needed to examine the role of physical attractiveness in the formation of anti-fat attitudes.

#### *The role of perceived causality and controllability in attributions of blame*

Perceptions about the cause of obesity and its malleability may be central to attributions about stigma. Holding obese people responsible for their weight and ascribing causes of obesity to personal factors like self-indulgence or laziness is common (7).

Several studies conducted by DeJong (68,69) assessed the influence of causal beliefs on attributions of obesity. In one study, female adolescents ( $n = 64$ ) were shown a photograph of either an overweight or normal weight peer. Half were told that a thyroid condition was the cause of the obesity in the overweight condition or that the thyroid condition was responsible for the pale skin of the normal weight figure. The obese target was evaluated negatively when there was no thyroid condition to account for her being overweight, but not when the target's obesity could be attributed to a physical cause (68). These results were replicated in a second study ( $n = 162$ ) where the overweight person was evaluated as less self-disciplined and more self-indulgent than the normal weight person with the thyroid condition, and unless the obese target could provide a reason for her weight that was beyond her control, she was negatively stigmatized (68).

Later, DeJong demonstrated the important role of responsibility (69). Participants ( $n = 168$ ) viewed a video of an obese or normal weight confederate (described with or without a glandular disorder) playing a board game in which she performed either below or above average. Although no differences emerged for attributions of task performance, the obese target without the glandular disorder was evaluated as less disciplined, more self-indulgent, and was less popular and least liked by participants (69). Taken together, these studies suggest that beliefs about the causality of obesity are highly influential in making stigmatizing attributions.

Crandall & Moriarty have more broadly demonstrated the power of attributions of control in predicting social rejection (70). They measured stigma toward 66 different diseases and health conditions (including obesity) where 415 participants completed questionnaires and evaluated three randomly assigned disease vignettes. Behavioural causality, or the degree to which one is held responsible for the disease, significantly predicted social distance and rejection by participants. For cases like obesity, which was perceived to be a disease under personal control, the result was substantial rejection in evaluations by participants. The authors concluded that 'one can find a significant amount

of sin in sickness, and consequently feel little compunction about rejecting those with onset-controllable illnesses' (p. 79) (70).

Crandall & Martinez further tested the role of ideology in fat prejudice by conducting cross-cultural comparisons of anti-fat attitudes in Mexico and the US (56). The authors proposed that components of self-determination and internal control are salient North American values and are central in attributions, but that anti-fat attitudes would not be related to these beliefs in cultures where self-determinism and individualism have less emphasis. Instead, their cross cultural analysis suggested that anti-fat attitudes only emerge if there is both a cultural preference for thinness and a belief that weight is under personal control. Results showed that anti-fat attitudes were strongly associated with social ideological variables in the American sample, but that this relationship was non-existent among Mexican students, whose attributions were unrelated to a social ideology perspective. The association between ideological and anti-fat attitudes was mediated by an attribution of controllability, where social ideology beliefs were related to beliefs in willpower and dislike among American students, but were not related to either of these constructs among Mexicans. The authors concluded that ideological components play a significant role in fat prejudice in America (56).

Most recently, Crandall and colleagues compared attributions toward obese people in six different countries, and replicated findings that anti-fat attitudes were best predicted by views that people are responsible for life outcomes along with cultural values that hold negative views about fatness (71). The combination of both factors was the strongest determinant of negative attitudes toward obesity, and countries that were ranked high on individualism such as Australia, Poland, and the US showed greater anti-fat attitudes than those ranked low on individualism like India, Turkey, and Venezuela.

In two experiments, Weiner and colleagues investigated the influence of perceived controllability and stability of 10 different stigmas, including obesity (60). In the first study, 59 participants rated stigmatized conditions for perceived controllability, stability, affective reactions, and help-related evaluations. In the second experiment ( $n = 149$ ), the authors manipulated information about the responsibility of each stigma so that subjects were told nothing about responsibility for the condition, that the target was perceived to be responsible for their condition, or that control over the condition existed. Obesity was characterized either as the result of a glandular dysfunction or because of excessive eating without exercise.

Mental-behavioural stigmas (including obesity, child abuse, drug abuse, AIDS, and Vietnam war syndrome) were perceived as onset-controllable and elicited feelings of anger, less sympathy, attributions of negative personality characteristics, and low ratings of helping tendencies (60).

In contrast, physically based stigmas (Alzheimer's disease, blindness, cancer, heart disease, and paraplegia) were perceived as uncontrollable and received more positive ratings. In addition, mental-behavioural stigmas were perceived as unstable or reversible in contrast to physically based stigmas that received stable, irreversible attributions. It is interesting to note that although obesity is a physical condition and can result in disabling physical handicaps, it was perceived to be more similar to socially deviant stigmatizing conditions that receive blame, like child abuse and drug addiction. This attribution may predict negative help-giving if people believe obesity can be changed easily through weight loss and that people who are obese do not deserve pity (5). Similar results were obtained by Menec & Perry who tested Weiner *et al.*'s (1988) attribution-judgement model among nine stigmas and experimentally manipulated the controllability of the onset of the stigma (72). Stigmas ascribed as controllable evoked more anger, less sympathy, and less willingness to help targets.

Additional research has varied the perceived controllability of stigmas in assessing attributions. In one study, 80 participants were randomly assigned to read a written scenario about an employer's decision to hire an obese applicant for a computer programming position; the controllability of the target's obese condition was varied (73). Perceived controllability of weight significantly influenced attributions. Participants found it more acceptable to act in a prejudiced hiring manner when weight was said to be controllable. Rush assessed reactions to six stigmas (including obesity) where 70 participants viewed and evaluated descriptions of each stigmatized target (54). The gender and race of the target, as well as the controllability of the onset of the stigma were manipulated. Again, the results showed a significant effect of controllability in influencing emotional reactions.

Overall, this body of work demonstrates how perceived controllability of the cause and maintenance of obesity becomes a central factor in stigma. Perceiving obese people to be responsible for their weight also reinforces attributions of blame highlighted by 'just world beliefs' and the Protestant work ethic. If hard work leads to success and failure results from inadequate effort, beliefs arise that obese people deserve to be denigrated because weight is under personal control.

#### *Conceptual and methodological issues*

Several limitations in attribution research should be corrected if this theoretical model is fully developed. In addition to the reliance on non-random student populations, a consistent weakness is to measure attributions by asking participants to indicate how they would respond to stigmatized individuals, and not actual behaviour (53). Most studies are correlational with little manipulation of causal attributions. However, the few experimental studies that

have been done are supported by theory and highlight the importance of attributions such as perceived causality. Given that two of these studies improved negative attitudes (18,54), continuing research that experimentally manipulates causal attributions may provide further support for the effect of attributions on attitudes toward obese people.

Despite that the attribution framework has been tested with weight stigma, this perspective remains in an early generation of theoretical development, and needs to be compared to other theories of stigma, which will be necessary to determine its utility in guiding stigma research.

The attribution model of weight stigma is useful for its ability to explain why obese people in particular are perceived to have specific traits. The most commonly reported stereotypes reflect poor personal control (lack of willpower, laziness, poor self-discipline, and self-indulgence) (7,9). The theory would predict that negative traits related to internal control lead to weight stigma, whereas individual characteristics outside of personal control such as height or eye colour would not be stigmatized. Similarly, the attribution model may help account for why obese persons themselves hold weight bias. Obese persons who hold Just world beliefs and Protestant ethic values may be more likely to make negative attributions about their own or others' excess weight. It is possible that obese persons do not initially have these attributions, but are confronted by stigma and societal blame to such a degree that they blame themselves for social denigration. Quinn & Crocker found that Protestant ethic beliefs were negatively related to psychological well-being in overweight women and positively related to well-being in normal weight women, although these relationships were not mediated by beliefs about the controllability of weight (74). The authors propose that the Protestant ethic is means for self-judgement, where obese persons feel they have failed in controlling weight because they lacked discipline and effort. Comparing anti-fat attitudes and self-stigma among obese individuals who do or do not have relevant attributional styles will be important.

The attribution perspective also helps explain why stigma is elicited by obesity, but not other thinner body types, and why thinness is valued. For instance, personal attributions of blame are more severe with obesity than with anorexia, where blame is often placed on external factors like family relationships, mass media, and unrealistic societal ideals of beauty. In both of these cases, attributions support sociocultural values that promote thinness and denigrate fatness. Some might also argue that these attributions serve to maintain consistency. That is, in the case of obesity, a person is viewed positively if they exert self-control to lose weight. However, in the case of anorexia, self-control as means of becoming thin is viewed negatively because such extreme personal discipline with food has maladaptive and dangerous consequences. Thus, in this case, external attributions (e.g. blaming poor family

relationships and the mass media) are necessary to maintain attributional consistency.

Finally, changing attributions of control could play a primary role in reducing negative attitudes and stigma. Little work has attempted to apply this theory to reduce stigma toward obese individuals. Of the published studies that have manipulated attributions of controllability and causality of weight there are mixed findings, where some work was able to improve attitudes toward obese individuals [e.g. Crandall's work (54)], and other research was not (47,75). More work is needed to find the contextual and individual difference variables that might explain when an attributional intervention will work.

### Brief review of other psychosocial models of stigma

Attribution theory is the only framework yet tested in the weight stigma area. A number of additional theories of stigma have been proposed in social psychology, including Realistic Conflict Theory, Social Identity Theory, Integrated Threat Theory, and evolutionary theories. These models are briefly presented here.

Realistic Conflict Theory proposes that prejudice arises from conflicts of interest between groups and from efforts to retain power or resources (status, money, land, etc.) (76–78). The application of this theory to weight stigma may be limited, as there is no evidence of competition for resources between obese and non-obese individuals. The theory also fails to explain why obese persons would stigmatize other obese people, or why thin individuals who possess valued qualities (such as attractiveness, popularity, or higher social status) would stigmatize obese individuals who are perceived to have none of these qualities, and therefore pose no threat. This theory suggests that promoting positive interactions between groups may reduce bias (77), but no research has tested the impact of increased contact with obese people on attitudes toward them. While research has demonstrated the effectiveness of interpersonal contact on attitude modification (79,80), certain types of stigmas could be less amenable to contact methods of attitude change. For example, Devine, Plant, & Harrison (1999) describe AIDS stigma as a condition that threatens health and poses symbolic threats to social values, making increased interpersonal contact an unlikely strategy for reducing stigma because of the complex methods that may be needed to change attitudes that are related to valued social identities (81). Like AIDS, obesity poses threats to health, threatens important social values (e.g. values of thinness) and, like AIDS sufferers, obese people are often blamed for their condition. Given the similar complexities of these stigmas, as well as the prevalence of obesity that makes it likely that interactions with obese persons are common, it may be difficult for interpersonal contact approaches to improve attitudes toward obese people.

Social Identity Theory suggests that stereotypes arise from a self-categorization process, in which we place ourselves into groups belonging to particular social categories, and develop our social identity by making comparisons between group memberships (79,82,83). The desire to maintain a positive social identity is at the core of prejudice. This is achieved by stereotyping other groups as inferior on attributes that are valued by the in-group. With weight stigma, normal weight individuals may believe that normal body weight is necessary for group membership, which would lead to downward comparisons to obese individuals as being inferior. Thus, this theory could provide some explanation of weight bias. It is not clear from this theory how negative traits came to be associated with obese individuals in the first place, or how to improve attitudes toward the stigmatized group. This theory is also unable to account for self-stigma among obese individuals, which would damage their own in-group identity.

Integrated Threat Theory proposes that four types of threat create bias: realistic threat to group well-being; symbolic threats that threaten the values or standards of the in-group; intergroup anxiety when groups feel threatened by each other; and negative stereotypes that increase anticipation of negative actions from the out-group (84–86). These four threats are more likely to be perceived if there is prior intergroup conflict, discrepancy in status, strong in-group identification, little knowledge of the out-group, and negative or little previous contact between groups.

Obese people do not seem to pose realistic threats to the welfare of normal weight individuals, but may symbolically threaten values of thinness or self-discipline. For example, there may be anxiety threats if thin people fear negative evaluation from other in-group members for associating with obese people. The likelihood of these threats leading to weight stigma is not known, and this theory does not explain the origin of specific negative stereotypes or self-stigma among obese people. Integrated threat theory implies that positive contact with obese people and increased knowledge about obesity may reduce threats that lead to prejudice. However, the few existing studies that have examined these issues in relation to weight stigma have failed to improve attitudes toward obese people (18,87).

Finally, some theorists have conceptualized stigma within the context of evolved dispositions. Neuberg and colleagues argue that group living has adaptive significance for survival and that individuals will be stigmatized if they are perceived to be exploitative or threaten group functioning (88). They suggest that stigma identifies and labels people who undermine group functioning so that group advantages (such as social acceptance) can be removed from threatening individuals. The degree to which groups perceive competition with other groups for valued resources is also an important predictor of who will be stigmatized.

A similar evolutionary hypothesis outlined by Kurzban & Leary, propose that stigma occurs when an individual is excluded from a group because of characteristics that are incompatible with those of the group (89). The person's characteristics emerge from 'evolved adaptations designed to cause people to avoid interactions that are differentially likely to impose fitness costs' (p. 188) (89). Individuals are motivated by specific adaptations to be members of social groups for the purposes of within-group cooperation and between-group competition. Once group membership is achieved, individuals exclude others in order to maintain resources for existing group members or if others do not advance the interests of the group. Individuals are stigmatized if they are inadequate social exchange partners, those with health risks, those who are aggressive toward members or violate property rules of the group, and so on (89). Recent work by Schaller & Park expands on Kurzban & Leary's ideas about individuals who are stigmatized because of perceived parasitic risks, and propose that prejudice can occur when groups of people display features that are markers of disease, even if they pose no health risk nor are contagious to others (M. Schaller & J.H. Park, unpublished data). This stems from evolutionary adaptations to avoid people who are believed to carry parasites or disease, which were historically communicable through personal contact (89).

Because the majority of work in the evolutionary framework has addressed stigmatizing conditions other than obesity, the evidence for an evolutionary explanation of weight stigma is lacking, and there is only indirect support at best. Research is needed to delineate the processes by which natural selection affects stigma, and to show how preferences leading to avoidance of obese individuals are established. Evolutionary models provide some explanation for why stigma may be elicited by obesity, but there are conceptual limitations. One is the assumption that negative traits associated with obese persons are accurate. In addition, there is some difficulty with assumptions that obese persons are stigmatized because of health problems that threaten group resources, given that diseases associated with obesity did not emerge as public health concerns until relatively recently, and much too late to have contributed to factors shaping natural selection of our primitive ancestors. Even if individuals are stigmatized for displaying markers of disease, thin individuals could also pose equally threatening health risks as obese individuals. For example, certain parasitic infestations (such as gastrointestinal parasites) usually result in weight loss, and might result in thin individuals being likely targets of ostracism. Of course, in circumstances of famine, thin individuals would also be at a disadvantage compared to heavier people who have excess calorie reserves. However, in our society today, thin people with health problems are generally not stigmatized. Health concerns have changed over time, and we live in an

environment where food is abundant and famine is no longer a concern, providing less motivation to stigmatize thin individuals.

Thus, it is not clear from evolutionary models why obesity is linked to particular negative traits, why social values of weight may change over time, or why certain subpopulations of obese people (such as obese women) are more stigmatized than others. To adopt an evolutionary framework of weight stigma would require documentation that obese persons threaten group cooperation, fitness, or survival by contributing fewer resources than they receive, and do so to a greater degree than other social groups with similar potential threats who are not stigmatized. The dearth of research in this area highlights many questions that can be pursued by applying evolutionary models more directly to the stigma of obesity.

### Stigma reduction

The increasing prevalence of obesity has not reduced weight bias. We often hear opinions that stigma may actually be helpful, if it motivates people to lose weight. There are many reasons to challenge this premise. First, most diets fail to achieve long-term weight loss, hence attempts to lose weight may be unsuccessful regardless of an individual's motives. Second, there are multiple harmful outcomes of stigma including discrimination (7) and negative impacts on health (48). Third, viewing stigma as a way to motivate obese people to lose weight will likely only increase already existing bias.

Without stigma-reduction interventions, obese people are left to cope with prejudice without assistance. Thus, a primary motive for any theory of weight stigma is to guide the development, testing and dissemination of stigma reduction interventions. Few studies have tested methods to reduce weight stigma, and those that have yield mixed findings.

Some work based on attribution theory was able to improve attitudes toward obese people by educating participants about the biological, genetic, and uncontrollable reasons for obesity (54). Another study successfully increased weight acceptance attitudes and reduced weight-related teasing by teaching elementary school children size acceptance (90). Some work has also improved attitudes by combining efforts to induce empathy and education about the uncontrollable causes of obesity (18).

Other research has demonstrated more pessimistic findings. Bell & Morgan (75) found that providing medical explanations for obesity outside of personal control did not improve children's negative attitudes toward an obese child. Another study found that emphasizing external, uncontrollable causes for obesity (e.g. biological and genetic factors) had little impact on improving negative attitudes or behaviours in adults (47).

Studies designed to evoke empathy toward obese people by having participants read stories about weight discrimination or watch empathic videos of obese women were unsuccessful in changing negative attitudes (47,91). Even interpersonal contact with obese persons has indicated poor results, as demonstrated in a study where negative attitudes of medical students did not improve following an eight-week rotation where students worked directly with obese patients (87). Some research shows intergroup contact to be a successful method of attitude change in certain contexts (80), and it has been proposed that conditions of contact that are most likely to improve attitudes are those involving equal status and non-stereotypical interactions (92). Given that doctor-patient interactions in medical settings do not easily lend themselves to equal status interactions, it is possible that the findings of no attitude change among medical students above (87) are due more to context than to the inability of interpersonal contact to improve attitudes. Increasing interpersonal contact in other contexts must be tested. The prevalence of obesity in North America is such that most people have had interpersonal contact with obese persons. Contact may be particularly helpful in reducing stigma when the stigmatized group is separated from or rarely encountered by the larger population. It becomes difficult to propose that lack of contact is responsible for weight stigma.

### A social consensus approach

Social consensus theory may provide a new means for testing stigma reduction. This theory explains stigma from a social constructionist view and emphasizes the influence of perceived consensus on the expression and endorsement of bias; stigma is a function of how one perceives the stigmatizing beliefs of others (93,94). For example, some work has demonstrated that individuals consistently changed their expression of racial beliefs after hearing another person express views about racism, regardless of whether the other person condemned or expressed acceptance for acts of racism (95). The effects remained when participant attitudes were measured both privately and publicly. The idea that stereotypes are consensual by nature is well established (92,96), but until recently has not been considered in stigma research.

Sharing beliefs provides a means to affiliate with others, and to achieve membership, attention, emotional support, acceptance, and security in social groups (97-102). Impression-management may also motivate stereotype formation as individuals may endorse similar attitudes to others if this increases respect, validation and approval from them (103). When people perceive their attitudes to be shared with others, they may feel more confident in their attitudes and increase perceptions of group cohesiveness (104). Some social groups maintain dominant beliefs through social

inclusion to reward members who endorse group attitudes (99). A person's stigmatizing attitudes are affected by perceptions about whether they are shared by others, and may be motivated by needs for acceptance (93).

Individuals will be affected by the perceived attitudes of groups who they deem to be important (105). Attitude change is more likely when relevant information comes from a valued in-group than from a disliked out-group (93,106-108), and when an individual perceives membership with the in-group or identity within the group is made salient (97,100,109,110). Stigmatizing beliefs may be created initially through contact with out-groups, but consensus develops through interaction with in-group members (101).

Some research has begun to provide impressive demonstrations of perceived consensus. In one study, after learning that others either shared or did not share their beliefs about certain social groups, participants modified their attitudes to be more similar to those of a desirable in-group and less similar to beliefs held by a disliked out-group (111). In another study, participants high on racial prejudice expressed more positive attitudes toward African Americans after receiving feedback about the favourable beliefs of others toward this group, compared to those who received negative feedback (112). Further support for social consensus comes from work by Crandall, Eshelman & O'Brien (113), who instructed participants to organize 105 social groups (including obese people) into categories according to how acceptable it was to feel negatively toward each group (. When a second sample of participants completed affective measures of stigma on the same social groups, high correlations were found between their reported bias and perceived acceptability of stigmatizing the groups, suggesting that the tendency to stigmatize others was based on perceptions of normative acceptability (113).

Two additional sets of studies have demonstrated that stereotypes can be created by manipulating perceptions of other's stereotypical beliefs. Stangor and colleagues found that participants endorsed fewer negative stereotypes toward African Americans when they learned that others held more favourable racial beliefs compared to their predictions (93). Negative stereotypes increased when feedback indicated that others held less favourable attitudes. Consensus information was also found to be more influential in changing stereotypes about African Americans if it came from an in-group source vs. an out-group source. In addition, when participants learned that others shared their beliefs about African Americans, their attitudes became more resistant to change compared to those who received consensus feedback that others did not share their beliefs.

Experiments by Sechrist & Stangor demonstrated that high-consensus information increases stereotype accessibility (94). Individuals low in prejudice who received high-

consensus feedback displayed more positive behaviours toward the stigmatized target than individuals who received low-consensus feedback, and prejudiced participants who received high-consensus feedback displayed more stigmatizing behaviours toward the target than those in the low-consensus condition. In a second experiment using lexical decision tasks, it was further found that participants in the high-consensus condition identified stereotypes of African Americans more quickly when these were followed by a 'black' prime compared to control primes (94).

Other work has examined potential mechanisms by which perceived consensus may influence endorsement of stereotypes. Some research suggests that stereotype consensus increases when a mutual social identity is shared by individuals (114) and when the salience of in-group membership is enhanced (115). In addition, individuals report more confidence in their attitudes when they are shared by others, and those who feel less confident in their beliefs show more attitude change following consensus feedback (G.B. Sechrist, C. Stangor & J.T. Jost, unpublished data). Underlying mechanisms of perceived social consensus remain to be fully understood.

Our own experimental studies support the social consensus framework as an effective method of changing attitudes toward obese people. We conducted three studies with university samples, where participants completed self-report measures of their attitudes toward obese people prior to and following manipulated consensus feedback depicting the attitudes of other students. In a first experiment, university students ( $n = 60$ ) who received favourable consensus feedback (that others held more favourable beliefs about obese people than participants) reported significantly less negative attitudes and more positive attitudes toward obese persons compared to their reported attitudes prior to feedback (R. Puhl, M.B. Schwartz & K.D. Brownell, unpublished data). In addition, these students also changed their reported beliefs about the causes of obesity following favourable consensus feedback, to beliefs that causes of obesity were more likely a result of factors outside of, rather than within, personal control. In a second study with university students ( $n = 55$ ), favourable consensus feedback was more influential in improving positive beliefs about obese people if this feedback came from an in-group vs. an out-group source. Thus, like previous research with racial stereotypes, this finding shows that attitudes toward obese people are more likely to change when relevant information comes from a valued in-group.

In our third experiment, we compared a social consensus approach (providing favourable consensus feedback) to four other methods of stigma reduction, including an attribution approach where participants were provided with written materials about the uncontrollable or controllable causes of obesity; a condition that provided students with

supposed scientific prevalence rates of stereotypical traits in obese people; or a control group. University students ( $n = 200$ ) were randomly assigned to one these five attitude-change conditions. As in our first experiment, results showed that participants' perceptions of others' attitudes significantly affected their own reported attitudes about obese people as well as their beliefs about the causes of obesity. In addition, receiving favourable consensus feedback was equally or more effective in changing attitudes toward obese people compared to the other methods of providing information about the uncontrollable causes of obesity and supposed scientific evidence about characteristic traits of obese individuals, both of which also improved participants' attitudes toward obese people. These experiments are the first to apply a social consensus framework to weight stigma, and they indicate that learning about the unbiased attitudes of others can be highly influential in understanding and improving attitudes toward obese people.

Although our work is the first to test social consensus with obesity stigma, there are a number of reasons why this method of stigma reduction may be especially relevant. First, this model helps explain widespread negative attitudes about obese individuals by addressing perceived beliefs of others. With obese persons stigmatized in the popular media (34), individuals may overestimate the degree that others share negative beliefs about obese individuals and in turn express biased stereotypes. Because negative stereotypes of obese individuals (as being lazy, undisciplined, less competent, and so on) are not based on evidence, individuals may form their negative opinions without considering previous interactions with obese individuals, and instead rely on perceptions of others' beliefs.

This approach also helps explain why obese individuals themselves may express negative stereotypes (44,46). Expressing negative attitudes toward obese persons may be a way for obese individuals to feel a part of valued social groups. Quinn & Crocker suggest that obese people might accept negative stereotypes in order to feel more alike the general culture, and to improve emotional well-being by perceiving themselves as 'apart' from their social group whose identity is defined by being fat (116).

Given the potential contributions of the social consensus framework and our own experimental research that suggests this approach is relevant to weight stigma, it is important that this method of stigma reduction move into new stages of research. The application of this model to stigmatized racial groups illustrates its potential utility with other stigmas, and additional empirical studies on weight stigma could be quite valuable. It will be especially important to determine how to utilize and disseminate perceived social consensus approaches in real-world settings, and to identify the most effective means of increasing awareness of favour-

able beliefs among members of valued social groups toward obese individuals.

## Discussion

The many unanswered questions about the origins of weight stigma, and the mixed findings on stigma reduction indicate the need to integrate theories and to find new conceptual approaches. Table 1 presents research questions that need to be addressed to help advance the field in its current understanding of the origins and nature of weight stigma. The theories presented in this paper may be helpful in this regard, as several general implications emerge. First, attribution theories have identified components of causality, stability, and controllability in forming biased attitudes toward obese individuals, hence this approach can be tested as a basis for stigma reduction strategies. It suggests that interventions may reduce bias through targeting attributions about the controllability, causality and stability of obesity, to help individuals recognize how their world views and attributional tendencies lead to bias. Changing attributions may involve directly targeting incorrect attributions or challenging more general knowledge about the stigmatized group (53). This approach is intuitively appealing and is supported by positive findings from two studies (18,54).

Second, the social consensus approach also offers a potential method for reducing weight stigma but has not been adequately tested. The potential to alter negative attitudes by changing perceptions about the normative acceptability of beliefs is an intriguing possibility. Interventions might present people with favourable attitudes about obese

persons by valued individuals in a context where tolerance is perceived to be desirable (117). Reduction efforts could also assess beliefs of individuals in various settings toward obese people, and then disseminate this information about the beliefs of others.

With promising avenues for research evident from both attributional and social consensus perspectives, it will be important to compare methods derived from these models. One model may be more fruitful than the other, but it is also possible that a blend of methods drawn from both theories will be especially helpful. Further studies are also needed to test whether attitude change translates into less biased behaviours toward obese individuals.

Combining theories is worth exploring, as is searching for subject variables that would predict whether one theory is helpful for particular individuals. An obvious variable might be the degree to which an individual endorses the ethic of personal responsibility, hard work, and a just world. An individual high in such beliefs may respond more to an attributional intervention than to other approaches.

Psychological work on weight stigma can be better developed with additional studies, but even then, psychological theories in the absence of input from other disciplines may be insufficient to explain the entire picture of weight bias. Stigma has both psychological and social origins. Conceptual questions about weight stigma may thus require sociological, anthropological, and cultural perspectives. Crandall and colleagues have been innovative in their integration of attributional and cultural milieu theories, which conceptualize attributions as part of a social-cognitive representation in culture (55,57,71).

**Table 1** Key research questions on weight stigma

- How do behavioural and self-report measures compare when assessing bias toward obese persons?
- How does attribution theory compare to other theories in explaining weight stigma?
- In what ways can existing models be integrated to explain weight stigma?
- Can social and evolutionary models of stigma be used to reduce bias?
- Which methods of stigma reduction are most effective for changing weight bias?
- Which contextual variables predict when and how stigma reduction approaches will be effective?
- How can models of stigma be used to create developmentally appropriate interventions for improving weight bias?
- To what degree can stigma reduction interventions produce changes in behaviour, as well as attitude changes?
- How do the nature, origins, and severity of weight stigma compare to stigmas for other conditions?
- How, and in what circumstances, does increased personal contact with obese persons affect weight bias?
- Is the relationship linear between level of obesity and severity of stigma?
- How accurate are trait assumptions that have become associated with obese people?
- What is the direction of association between obesity and various psychosocial variables (e.g. SES, IQ)?
- Do obese people have attribution styles that reinforce or relate to self-stigma?
- To what extent do obese individuals stigmatize others based on weight?
- What are the reasons for more severe weight stigma experienced by certain subpopulations of obese people than others? Which groups are most vulnerable?
- Do experiences of weight bias contribute further to exacerbation of obesity?
- Are negative attitudes toward obese persons transmitted through transgenerational relationships?
- To what degree are individual negative attitudes toward obese people broadening to an institutional level?
- In what ways can stigma affect health?

SES, socioeconomic status; IQ, intelligence quotient.

Thus, while psychological research undoubtedly plays a central role in the topic of weight stigma, it will be important to examine components of non-psychological approaches as well. This could include efforts to test the applicability of other approaches to weight stigma, compare these models with psychological theories, and examine ways to integrate different theoretical perspectives to maximize our ability to both explain and reduce stigma of obese persons.

## Conclusions

Many gaps exist in present research, hence the science must mature to provide a basis for fully understanding and then ameliorating weight stigma. The stakes are high. While preventing obesity is an ideal way of removing weight bias, it is unlikely that successful prevention efforts will be identified or implemented any time soon. Thus, vast numbers of people stand to be affected by stigma, and the impact of bias and discrimination on public health could be considerable. The longer that we allow bias and prejudice against obese individuals to remain widespread and acceptable, the more likely that individual negative attitudes will also become established on an institutional level.

An ideal and comprehensive theory of obesity stigma would identify the origins of weight bias, explain why stigma is elicited by obese body types, account for the association between certain negative traits and obesity, and suggest methods for reducing bias. Existing theories do not yet meet all these criteria. Attribution and social consensus theories presented in this review have potential to offer substantial contributions to existing knowledge of weight stigma, but each also has limitations.

Attribution models are helpful in explaining the origins of obesity stigma, and empirical support for these approaches is well developed. Because of insufficient research for other theoretical models, it is premature to embrace other perspectives. There has been no comparison of the attributional framework with other models of stigma, there is no indication of whether this model best explains stigmatizing attitudes, or whether it is the best approach on which to base stigma reduction efforts.

Research in this area thus far remains in an early generation of theoretical development, focusing primarily on developing theories of stigma. A next generation is needed to test proposed theories among stigmatized groups, to apply these theories specifically to the stigma of obesity, and to compare the predictive abilities of existing theories. Supported theories can then be used to prepare stigma reduction interventions. The ultimate generation involves longitudinal research where the relationship between stereotypical attitudes toward obese individuals and actual behavioural responses can be tested, and effective stigma reduction approaches can be disseminated.

To address the gaps that exist in knowledge about weight stigma, methodological advances must be undertaken. It is necessary to improve methods with larger samples, obese participants, and experimental and ecologically valid settings; it is important to test the applicability of general models of stigma to the specific case of obesity; it is essential to compare various models to determine the most reliable and valid predictors of anti-fat attitudes; and it is crucial to use these models to plan stigma reduction efforts. Achieving these outcomes may require psychological approaches to be combined or integrated with theories of stigma in other disciplines.

Because so many individuals are obese, the likelihood of stigmatization and discrimination is substantial. With documentation of the stigma of obesity as early as medieval times (118), growing awareness of the pervasiveness of this stigma in present societies, and signs that the stigma is intensifying (33), the situation may worsen if steps are not taken to alleviate negative attitudes. Considerable work has demonstrated that bias and discrimination occur (7), and attention should be turned to understanding the conceptual origins of this stigma and identifying how theories can be used to decrease this bias.

## References

1. Crocker J, Major B, Steele C. Social stigma. In: Gilbert DT, Fiske ST, Lindzey G (eds). *Handbook of Social Psychology*. 4th edn, Vol. 2. McGraw-Hill: Boston, 1998, pp 504–553.
2. Crocker J, Major B. Social stigma and self-esteem: the self-protective properties of stigma. *Psychol Rev* 1989; **96**: 608–630.
3. Garner DM. The body image survey results. *Psychol Today* 1997; **30**: 30–47.
4. Falkner NH, French SA, Jeffery RW, Neumark-Sztainer D, Sherwood NE, Morton N. Mistreatment due to weight: prevalence and sources of perceived mistreatment in women and men. *Obes Res* 1999; **7**: 572–576.
5. Kilbourne J. Still killing us softly: advertising and the obsession with thinness. In: Fallon P, Katzman MA, Wooley SC (eds). *Feminist Perspectives on Eating Disorders*. Guilford Press: New York, 1994, pp 395–418.
6. Myers A, Rosen JC. Obesity stigmatization and coping: relation to mental health symptoms, body image, and self-esteem. *Int J Obesity* 1999; **23**: 221–230.
7. Puhl R, Brownell KD. Obesity, bias and discrimination. *Obes Res* 2001; **9**: 788–805.
8. Roehling MV. Weight-based discrimination in employment: psychological and legal aspects. *Pers Psychol* 1999; **52**: 969–1017.
9. Paul RJ, Townsend JB. Shape up or ship out? Employment discrimination against the overweight. *Employee Responsibilities Rights Journal* 1995; **8**: 133–145.
10. Bordieri JE, Drehmer DE, Taylor DW. Work life for employees with disabilities: recommendations for promotion. *Rehabil Couns Bull* 1997; **40**: 181–191.
11. Pagan JA, Davila A. Obesity, occupational attainment, and earnings. *Soc Sci Quart* 1997; **78**: 756–770.
12. Register CA, Williams DR. Wage effects of obesity among young workers. *Soc Sci Quart* 1990; **71**: 130–141.

13. Rothblum ED, Brand PA, Miller CT, Oetjen HA. The relationship between obesity, employment discrimination, and employment-related victimization. *J Vocat Behav* 1990; 37: 251–266.
14. Davis-Coelho K, Waltz J, Davis-Coelho B. Awareness and prevention of bias against fat clients in psychotherapy. *Prof Psychol-Res Pr* 2000; 31: 682–684.
15. Maddox GL, Liederman V. Overweight as a social disability with medical implications. *J Med Educ* 1969; 44: 214–220.
16. Maroney D, Golub S. Nurses' attitudes toward obese persons and certain ethnic groups. *Percept Motor Skill* 1992; 75: 387–391.
17. Price JH, Desmond SM, Krol RA, Snyder FF, O'Connell JK. Family practice physicians' beliefs, attitudes, and practices regarding obesity. *Am J Prev Med* 1987; 3: 339–345.
18. Wiese HJ, Wilson JF, Jones RA, Neises M. Obesity stigma reduction in medical students. *Int J Obesity* 1992; 16: 859–868.
19. Teachman BA, Brownell KD. Implicit anti-fat bias among health professionals: is anyone immune? *Int J Obesity* 2001; 25: 1525–1531.
20. Fontaine KR, Faith MS, Allison DB, Cheskin LJ. Body weight and health care among women in the general population. *Arch Fam Med* 1998; 7: 381–384.
21. Olson CL, Schumaker HD, Yawn BP. Overweight women delay medical care. *Arch Fam Med* 1994; 3: 888–892.
22. Kristeller JL, Hoerr RA. Physician attitudes toward managing obesity: differences among six specialty groups. *Prev Med* 1997; 26: 542–549.
23. Canning H, Mayer J. Obesity – its possible effect on college acceptance. *New Engl J Med* 1966; 275: 1172–1174.
24. Neumark-Sztainer D, Story M, Faibisch L. Perceived stigmatization among overweight African-American and Caucasian adolescent girls. *J Adol Health* 1998; 23: 264–270.
25. Weiler K, Helms LB. Responsibilities of nursing education: the lessons of Russell v Salve Regina. *J Prof Nurs* 1993; 9: 131–138.
26. Crandall CS. Do parents discriminate against their heavy-weight daughters? *PSPB* 1995; 21: 724–735.
27. Adams GR, Hicken M, Salehi M. Socialization of the physical attractiveness stereotype: parental expectations and verbal behaviors. *Int J Psychol* 1988; 23: 137–149.
28. Cramer P, Steinwert T. Thin is good, fat is bad: how early does it begin? *J Appl Dev Psychol* 1998; 19: 429–451.
29. Brylinsky JA, Moore JC. The identification of body build stereotypes in young children. *J Res Pers* 1994; 28: 170–181.
30. Kraig KA, Keel PK. Weight-based stigmatization in children. *Int J Obesity* 2001; 25: 1661–1666.
31. Wardle J, Volz C, Golding C. Social variation in attitudes to obesity in children. *Int J Obesity* 1995; 19: 562–569.
32. Richardson SA, Goodman N, Hastorf AH, Dornbusch SM. Cultural uniformity in reaction to physical disabilities. *Am Sociol Rev* 1961; 26: 241–247.
33. Latner JD, Stunkard AJ. Getting worse: the stigmatization of obese children. *Obes Res* 2003; 11: 452–456.
34. Greenberg BS, Eastin M, Hofshire L, Lachlan K, Brownell KD. The portrayal of overweight and obese persons in commercial television. *Am J Public Health* 2003; 93: 1342–1348.
35. Sobal J, Stunkard AJ. Socioeconomic status and obesity: a review of the literature. *Psychol Bull* 1989; 105: 260–275.
36. Goodman E. The role of socioeconomic status gradients in explaining differences in US adolescents' health. *Am J Public Health* 1993; 89: 1522–1528.
37. Gortmaker SL, Must A, Perrin JM, Sobol AM, Dietz WH. Social and economic consequences of overweight and young adulthood. *New Engl J Med* 1993; 329: 1008–1012.
38. Elias MF, Elias PK, Wolf PA, D'Agostino RB. Lower cognitive function in the presence of obesity and hypertension: the Framingham heart study. *Int J Obesity* 2003; 27: 260–280.
39. Li X. A study of intelligence and personality in children with simple obesity. *Int J Obes Relat Metab Disord* 1995; 19: 355–357.
40. Li B, Yang G, YuH, Huang G. Intelligent difference between children with simple obesity and malnutrition. *Chinese Mental Health J* 1998; 12: 353–354.
41. Teasdale TW, Sorensen TI, Stunkard AJ. Intelligence and educational level in relation to body mass index of adults. *Hum Biol* 1992; 64: 99–106.
42. Sargent JD, Blanchflower DG. Obesity and stature in adolescence and earnings in young adulthood. Analysis of a British birth cohort. *Arch Pediat Adol Med* 1994; 148: 681–687.
43. Neumark-Sztainer D, Story M, Harris T. Beliefs and attitudes about obesity among teachers and school health care providers working with adolescents. *J Nut Educ* 1999; 31: 3–9.
44. Crandall C, Biernat M. The ideology of anti-fat attitudes. *J Appl Soc Psychol* 1990; 20: 227–243.
45. Harris MB, Waschull S, Walters L. Feeling fat: motivations, knowledge, and attitudes of overweight women and men. *Psychol Rep* 1990; 67: 1191–1202.
46. Crocker J, Cornwell B, Major B. The stigma of overweight: affective consequences of attributional ambiguity. *JPSP* 1993; 64: 60–70.
47. Teachman BA, Gapinski KD, Brownell KD, Rawlins M, Jeyaram S. Demonstrations of implicit anti-fat bias: the impact of providing causal information and evoking empathy. *Health Psychol* 2003; 22: 68–78.
48. Guyll M, Matthews KA, Bromberger JT. Discrimination and unfair treatment: relationship to cardiovascular reactivity among African American and European American women. *Health Psychol* 2001; 20: 315–325.
49. Krieger N. Embodying inequality: a review of concepts, measures, and methods for studying health consequences of discrimination. *Int J Health Serv* 1999; 29: 295–352.
50. Sturm R. The effects of obesity, smoking, and problem drinking on chronic medical problems and health care costs. *Health Affair* 2002; 21: 245–253.
51. Carpenter KM, Hasin DS, Allison DB, Faith MS. Relationships between obesity and DSM-IV major depressive disorder, suicide ideation, and suicide attempts: results from a general population study. *Am J Public Health* 2000; 90: 251–257.
52. Rush LL. Affective reactions to multiple social stigmas. *J Soc Psychol* 1998; 138: 421–430.
53. Corrigan PW. Mental health stigma as social attribution: implications for research methods and attitude change. *Clin Psychol-Sci Pr* 2000; 7: 48–67.
54. Crandall CS. Prejudice against fat people: ideology and self-interest. *JPSP* 1994; 66: 882–894.
55. Crandall CS, Schiffhauer KL. Anti-fat prejudice: beliefs, values, and American culture. *Obes Res* 1998; 6: 458–460.
56. Crandall CS, Martinez R. Culture, ideology, and antifat attitudes. *PSPB* 1996; 22: 1165–1176.
57. Crandall CS, Cohen C. The personality of the stigmatizer. Cultural world view, conventionalism, and self-esteem. *J Res Pers* 1994; 28: 461–480.
58. Fairburn CG, Brownell KD. *Eating Disorders and Obesity: a Comprehensive Handbook*. 2nd edn. Guilford Press: New York, 2001.
59. Larkin JC, Pines HA. No fat persons need apply: experimental studies of the overweight stereotype and hiring preference. *Sociol Work Occup* 1979; 6: 312–327.

60. Weiner B, Perry R, Magnusson J. An attributional analysis of reactions to stigmas. *JSPS* 1988; 55: 738–748.
61. Crandall CS. Ideology and lay theories of stigma: the justification of stigmatization. In: Heatherton TF, Kleck RE, Hebl MR, Hull JG (eds). *The Social Psychology of Stigma*. The Guilford Press: New York, 2000, pp 126–152.
62. Biernat M, Vescio TK, Theno SA, Crandall CS. Values and prejudice: toward understanding the impact of American values on outgroup attitudes. In: Seligman C, Olson JM, Zanna MP (eds). *The Ontario Symposium: Vol. 8: the Psychology of Values*, Erlbaum: Hillsdale, NJ, 1996, pp 153–189.
63. Katz I, Hass RG. Racial ambivalence and American value conflict: correlational and priming studies of dual cognitive structures. *JSPS* 1988; 55: 893–905.
64. Crandall CS. Do heavy-weight students have more difficulty paying for college? *PSPB* 1991; 17: 606–611.
65. Dion KL, Dion KK. Belief in a just world and physical attractiveness stereotyping. *JSPS* 1987; 52: 775–780.
66. Lerner M. *The Belief in a Just World: a Fundamental Delusion*. Plenum Press: New York, 1980.
67. Eagly AH, Ashmore RD, Makhijani MG, Longo LC. What is beautiful is good... a meta-analytic review of research on the physical attractiveness stereotype. *Psychol Bull* 1991; 110: 109–128.
68. DeJong W. Obesity as a characterological stigma: the issue of responsibility and judgments of task performance. *Psychol Rep* 1993; 73: 963–970.
69. DeJong W. The stigma of obesity: the consequences of naïve assumptions concerning the causes of physical deviance. *J Health Soc Behav* 1980; 21: 75–87.
70. Crandall CS, Moriarty D. Physical illness stigma and social rejection. *Br J Soc Psychol* 1995; 34: 67–83.
71. Crandall CS, D'Anello S, Sakalli N, Lazarus E, Wiczorkowska G, Feather NT. An attribution-value model of prejudice: anti-fat attitudes in six nations. *PSPB* 2001; 27: 30–37.
72. Menec VH, Perry RP. Reactions to stigmas among Canadian students: testing an attributional-affect-help judgement model. *J Soc Psychol* 1998; 138: 443–454.
73. Rodin M, Price J, Sanchez F, McElliot S. Derogation, exclusion, and unfair treatment of persons with social flaws: controllability of stigma and the attribution of prejudice. *PSPB* 1989; 15: 439–451.
74. Quinn DM, Crocker J. When ideology hurts: effects of belief in the Protestant ethic and feeling overweight on the psychological well-being of women. *JSPS* 1999; 77: 402–414.
75. Bell S, Morgan SB. Children's attitudes and behavioral intentions toward a peer presented as obese. Does a medical explanation for the obesity make a difference? *J Pediatr Psychol* 2000; 25: 137–145.
76. LeVine RA, Campbell DT. *Ethnocentrism*. John Wiley: New York, 1972.
77. Sherif M. Superordinate goals in the reduction of intergroup conflict. *Am J Sociol* 1958; 63: 349–356.
78. Wolfe CT, Spencer SJ. Stereotypes and prejudice: their overt and subtle influence in the classroom. *Am Behav Sci* 1996; 40: 176–185.
79. Brewer MB. In-group bias in the minimal intergroup situation: a cognitive motivational analysis. *Psychol Bull* 1979; 86: 307–324.
80. Pettigrew TF, Tropp LR. Does intergroup contact reduce prejudice: recent meta-analytic findings. In: Oskamp S (ed.). *Reducing Prejudice and Discrimination. The Claremont Symposium on Applied Social Psychology*. Lawrence Erlbaum Associates, Inc.: NJ, 2000, pp 93–114.
81. Devine PG, Plant EA, Harrison K. The problem of 'us' versus 'them' and AIDS stigma. *Am Behav Sci* 1999; 42: 1208–1224.
82. Tajfel H, Turner JC. An integrative theory of intergroup conflict. In: Austin W, Worchel S (eds). *The Social Psychology of Intergroup Relations*. Brooks/Cole: Monterey, CA, 1979, pp 33–48.
83. Tajfel H, Turner JC. Social identity theory of intergroup behavior. In: Austin W, Worchel S (eds). *Psychology of Intergroup Relations*. Nelson-Hall: Chicago, 1986, pp 7–24.
84. Stephan WG, Stephan C. Intergroup anxiety. *J Soc Issues* 1985; 41: 157–176.
85. Stephan WG, Stephan C. Antecedents of intergroup anxiety in Asian-Americans and Hispanic-Americans. *Int J Intercult Comm* 1989; 13: 203–219.
86. Stephan WG, Stephan C. Reducing intercultural anxiety through intercultural contact. *Int J Intercult Rel* 1992; 16: 96–106.
87. Blumberg P, Mellis LP. Medical students' attitudes toward the obese and morbidly obese. *Int J Eating Disorders* 1980, 69–175.
88. Neuberg SL, Smith DM, Asher T. Why people stigmatize: toward a biocultural framework. In: Heatherton TF, Kleck RE, Hebl MR, Hull JG (eds). *The Social Psychology of Stigma*. The Guilford Press: New York, 2000, pp 31–61.
89. Kurzban R, Leary MR. Evolutionary origins of stigmatization: the functions of social exclusion. *Psychol Bull* 2001; 127: 187–208.
90. Irving LM. Promoting size acceptance in elementary school children: the EDAP puppet program. *Eating Disorders: Treatment Prevention* 2000; 8: 221–232.
91. Gapinski KD, Schwartz MB, Brownell KD. A media approach to changing antifat attitudes and behavior. 2003 (in press).
92. Allport GW. *The Nature of Prejudice*. Addison-Wesley: Reading, MA, 1954.
93. Stangor C, Sechrist GB, Jost JT. Changing beliefs by providing consensus information. *PSPB* 2001; 27: 486–496.
94. Sechrist GB, Stangor C. Perceived consensus influences intergroup behavior and stereotype accessibility. *JSPS* 2001; 80: 645–654.
95. Blanchard FA, Crandall CS, Brigham JC, Vaughn LA. Condemning and condoning racism: a social context approach to interracial settings. *J Appl Psychol* 1994; 79: 993–997.
96. Katz D, Braly KW. Racial stereotypes of one hundred college students. *J Abnorm Soc Psych* 1933; 28: 280–290.
97. Abrams D, Hogg MA. Social identification, self-categorization and social influence. In: Stroebe W, Hewstone M (eds). *European Review of Social Psychology* (Vol. 1). Wiley: Chichester, UK, 1990.
98. Baumeister RF, Leary MR. The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychol Bull* 1995; 117: 497–529.
99. Hill CA. Affiliation motivation: people who need people... but in different ways. *JSPS* 1987; 52: 1008–1018.
100. Levine JM, Bogart LM, Zdzianik B. Impact of anticipated group membership on cognition. In: Sorrentino RM, Higgins TE (eds). *Handbook of Motivation and Cognition*, Vol. 3: *the Interpersonal Context*. The Guilford Press: New York, NY, 1996, pp 531–567.
101. Stangor C, Crandall CS. Threat and social construction of stigma. In: Heatherton TF, Kleck RE, Hebl MR, Hull JG (eds). *The Social Psychology of Stigma*. The Guilford Press: New York, 2000, pp 62–87.
102. Stangor C, Schaller M. Stereotypes as individual and collective representations. In: Stangor C (ed.). *Stereotypes and Prejudice: Essential Readings. Key Readings in Psychology*. Psychology Press/Taylor & Francis: Philadelphia, PA, 2000, pp 64–82.

103. Schaller M, Conway LG. Influence of impression-management goals on the emerging contents of group stereotypes: support for a social-evolutionary process. *PSPB* 1999; 25: 819–833.
104. Bar-Tal D. *Shared Beliefs in a Society*. Sage: Thousand Oaks, CA, 2000.
105. Levine JM, Resnick LB, Higgins ET. Social foundations of cognition. *Annu Rev Psychol* 1993; 44: 585–612.
106. Abrams D, Wetherell M, Cochrane S, Hogg M. Knowing what to think by knowing who you are: self-categorization and the nature of norm formation, conformity, and group polarization. *Br J Soc Psychol* 1990; 29: 97–119.
107. Martin R. Ingroup and outgroup minorities: differential impact upon public and private responses. *Eur J Soc Psychol* 1988; 18: 39–52.
108. Turner JC, Oakes PJ. Self-categorization theory and social influence. In: Paulus PB (ed.). *The Psychology of Group Influence*. 2nd edn. Lawrence Erlbaum: Hillsdale, NJ, 1989.
109. Terry DJ, Hogg MA. Group norms and the attitude-behavior relationship: a role for group identification. *PSPB* 1996; 22: 776–793.
110. Turner JC, Wetherell MS, Hogg MA. Referent informational influence and group polarization. *Br J Soc Psychol* 1989; 28: 135–147.
111. Haslam SA, Oakes PJ, McGarty C, Turner JC, Reynolds KJ, Eggins RA. Stereotyping and social influence: the mediation of stereotype applicability and sharedness by the views of in-group and out-group members. *Br J Soc Psychol* 1996; 35: 369–397.
112. Wittenbrink R, Henly JR. Creating social reality: informational social influence and the content of stereotypic beliefs. *PSPB* 1996; 22: 598–610.
113. Crandall CS, Eshleman A, O'Brien L. Social norms and the expression and suppression of prejudice: the struggle for internalization. *JSPS* 2002; 82: 359–378.
114. Haslam SA, Turner JC, Oakes PJ, Reynolds KJ, Eggins RA, Nolan M, Tweedie J. When do stereotypes become really consensual? Investigating the group-based dynamics of the consensualization process. *Eur J Soc Psychol* 1998; 28: 755–776.
115. Haslam SA, Oakes PJ, Reynolds KJ, Turner JC. Social identity salience and the emergence of stereotype consensus. *PSPB* 1999; 25: 809–818.
116. Quinn DM, Crocker J. Vulnerability to the affective consequences of the stigma of overweight. In: Swim JK, Stangor C (eds). *Prejudice: the Target's Perspective*. Academic Press: San Diego, CA, 1998, pp 125–143.
117. Stangor C, Sechrist GB, Jost JT. Social influence and intergroup beliefs: the role of perceived social consensus. In: Forgas JP, Williams KD (eds). *Social Influence: Direct and Indirect Processes*. Psychology Press: Philadelphia, PA, 2001, pp 235–252.
118. Stunkard AJ, LaFleur WR, Wadden TA. Stigmatization of obesity in medieval times: Asia and Europe. *Int J Obesity* 1998; 22: 1141–1144.