When are anti-fat attitudes understood as prejudice versus truth? An experimental study of social influence effects

G. C. Lee¹, M. J. Platow¹, M. Augoustinos², D. Van Rooy¹, R. Spears³ and D. Bar-Tal⁴

¹Research School of Psychology, The Australian National University, Canberra, Australia; ²School of Psychology, The University of Adelaide, Adelaide, Australia; ³Faculty of Behavioural and Social Sciences, Groningen University, Groningen, The Netherlands; ⁴School of Education, Tel Aviv University, Tel Aviv, Israel.

Summary

Background/Objectives
If people who hold anti-fat attitudes believe these attitudes to be true, then anti-prejudice appeals are likely to be unsuccessful, if only because the targets will not see their attitudes as in need of change. The current study examined processes that may lead people to see their anti-fat attitudes as ‘truth’ or as ‘prejudice’.

Subjects/Methods
Participants (N = 482) read anti-fat statements and were then presented with an interpretation of these statements as ‘truth’ or ‘prejudice’. The source of this interpretation was either an (i) in-group or out-group member and (ii) expert or non-expert. Participants’ judgements of the statements were expected to vary such that in-group others and experts would exert more influence than would out-group others and non-experts.

Results
Participants aligned their own interpretations of an anti-fat statement with those of an expert, but not with those of a non-expert, $F(1,466) = 8.97, p < 0.05, \eta_p^2 = 0.02$. The group membership variable had no effect on judgements of ‘truth’ or ‘prejudice’ of the anti-fat statement.

Conclusion
The expressions that people believe constitute anti-fat prejudice versus truth about people described as overweight are influenced by exposure to expert opinion (in this case, by medical doctors). Implications for the success of weight-based anti-prejudice appeals and for healthcare provision are discussed.

Keywords: Expertise, prejudice, social influence, weight stigma.

Introduction

Up to 40% of American adults have experienced anti-fat stigma personally (1). Anti-fat stigma, or negative attitudes about people who are in the overweight or obese weight range (2), is present across many areas of life (e.g. workplace, school, family, social settings, and health care) (3), with various negative social, psychological, and economic consequences. Negative social outcomes include bullying and victimization (4); negative psychological outcomes include body image disturbances (5) and increased risk of depression (e.g. (4)); and negative economic outcomes include decreased likelihood of college attendance (6) and enhanced likelihood of being overlooked for employment promotions (e.g. (7)). Furthermore, internalization of anti-fat attitudes (self-stigmatization) has links to poorer self-reported physical functioning and poorer self-reported mental health (5).

The widespread prevalence of weight-based stigma has led to claims that anti-fat sentiment is often seen by people as an acceptable prejudice to both hold and express (3). Proposals for more effective public anti-prejudice appeals are now becoming common in the domain of anti-fat attitudes (8). Yet a recent systematic review has suggested that many existing weight-based anti-prejudice interventions have little evidence of...
effectiveness at reducing pervasive negative beliefs about overweight and obesity (9).

One reason why existing anti-prejudice appeals fail to reduce anti-fat beliefs may be because little is currently known about what people actually perceive to constitute ‘prejudice’. Also unknown are the mechanisms by which people perceive specific attitudes and behaviours to be prejudice (and ‘not’ prejudice) and how these perceptions may be changed. Without this knowledge, the efficacy of weight-based anti-prejudice appeals will remain unclear, primarily because people may see anti-prejudice appeals as irrelevant to their own attitudes and behaviours (which they may well see as grounded in truth). To create relevant appeals against anti-fat prejudice, people’s perceptions of what constitutes ‘prejudice’ and knowledge about how to influence these perceptions need first to be gained. The current study seeks to examine this gap in the literature.

Anti-fat attitudes are common partly because of entrenched beliefs that people in the overweight range are to blame for their weight (e.g. (10)). Put simply, people with overweight and obesity are stereotyped as ‘lack self-discipline’ (11), leading to their disparagement (12). Yet the simplistic characterization of overweight as caused by readily controllable factors does not adequately represent existing scientific findings about the uncontrollable determinants of overweight (10, p. 884), including an obesogenic environment (13), certain medications (14), genetics and metabolic factors (10), psychiatric conditions (e.g. binge-eating disorder; (15)), medical conditions (e.g. chronic fatigue; (16)) and perceived weight-based stigmatization (17,18).

Nevertheless, research on attitude framing has found that many people who hold anti-fat attitudes do so because of their belief in the truthfulness of claims that weight is readily controllable, which they see as a matter of fact (e.g. (19)). In this way, people justify their anti-fat attitudes on the grounds that people who are overweight or obese are at fault and blameworthy (20). That these (incorrect) beliefs have become a cultural dogma highlights the need to know more about what people do, and do not, perceive to constitute anti-fat ‘prejudice’. It highlights the possibility that people may not perceive negative attitudes about overweight to be prejudice but, instead, to be something else, such as ‘truth’.

There are claims in the literature to support the assertion that people may perceive expressions of prejudice as mutually exclusive from what they view as ‘truth’. For example, when people perceive their attitudes to be factual, they use claims of ‘truth’ as a protection against accusations of ‘prejudice’ (21). Moreover, if people perceive stereotypes to contain a ‘kernel of truth’, they may be less likely to believe that the stereotype is a form of ‘prejudice’ (22).

This raises a question about the factors that might affect perceptions of whether anti-fat attitudes are ‘prejudice’ or not. Persuasion research suggests perceptions may be affected by direct and indirect social influence from others. Whilst there are some findings to suggest that social influence is operative in the domain of weight and stigma (23), social influence has not been widely studied with regard to people’s perceptions of whether specific anti-fat statements constitute ‘prejudice’ or ‘truth’. The current study examines two features of the source of influence that have received considerable attention in other attitudinal domains: shared group membership and expertise.

People are persuaded by others whom they perceive to be similar to them (i.e. in-group members, (24,25)). For example, facial mimicry of others’ negative emotions has been shown to occur as a function of in-group-based social influence (26). In the domain of attitudes, people’s understandings of language (27) and aesthetics (28) are influenced more by in-group than out-group members. Even with regard to food intake, people’s own eating is influenced by in-group members but not out-group members (29). Overall, a meta-analysis has indicated that the persuasiveness of a source will be significantly lower when that source is perceived as an out-group member than an in-group member (30).

Speaking specifically to the literature on prejudice, people’s expressions of prejudice have been found to correlate strongly with levels of in-group acceptance of that expression (31). In the current context then, whether people will be influenced to perceive an anti-fat statement to be an example of ‘prejudice’ or ‘truth’, based on whether an in-group member has appraised it as such, is of interest.

Shared group membership is not the only mechanism involved in social influence; the expertise of a person who makes an influence attempt is also an important contributor. Persuasion via expertise involves people’s assumptions about knowledge and accuracy (32), so that education level and formal rank are factors that lead people to form expectations of another’s expertise (33).

Messages delivered by experts are significantly more influential on people’s attitudes than messages delivered by non-experts (34). People assume that experts are credible sources (35) and that experts possess knowledge (36). If an expert’s knowledge is relevant to a topic of discussion, then it becomes particularly persuasive (37). What is less clear is the role that experts and medical doctors in particular play in shaping people’s perceptions of what constitutes anti-fat ‘prejudice’ versus ‘truth’.

The current study aims to learn more about how and when people will perceive specific claims to constitute weight-based prejudice. The current study does not
examine people’s expressions of prejudice, per se, but rather people’s views on what is, or is not, an anti-fat attitude, and the circumstances in which these views may be influenced by others. Review of literature in this field suggests that there are no extant studies on the perceived acceptability of anti-fat statements that are seen as ‘true’, in contrast to anti-fat statements that are seen as ‘prejudice’.

Three hypotheses are proposed. It is first hypothesized that participants will perceive ‘prejudice’ and ‘truth’ as inversely related; the more a statement is seen as truth, the less it will be seen as prejudice (H1). In terms of social influence, it is hypothesized that shared group membership with an influencing agent will result in higher persuasion compared with when no shared group membership is present (H2). Lastly, it is hypothesized that the views of an influencing agent with relevant expertise will be more persuasive than those same views held by an influence agent without relevant expertise (H3).

Methods

Participants

Participants were assigned to one condition of a 2 (influence attempt of an anti-fat statement: ‘truth’/‘prejudice’) × 2 (influencing agent’s group membership: in-group/out-group) × 2 (influencing agent’s expertise: expert/non-expert) between-participants factorial design. Participants were recruited through an online advertisement placed on Amazon’s Mechanical Turk platform. The advertisement informed prospective participants that the study was interested in ‘people’s opinions about themselves and others’. Participants were eligible if they were over 18 years old, spoke English as a first language and had an account registered to a residential address in the USA.

The mean study completion time was 10 min (SD = 4 minutes). Any participant who failed more than one manipulation check (described below; n = 20); who failed more than one of four items adapted from the Conscientious Responder Scale (n = 37; (38) or who completed the study in fewer than 3.99 minutes (suggesting that they did not properly engage with the study; n = 14) was excluded. These exclusionary criteria were determined in advance of performing data analysis. Notwithstanding, subsequent analyses revealed that the pattern of significant results was unaffected by inclusion of the data that were excluded from the primary analysis.

The final sample was 482 people (female = 229; male = 249; other = 3; prefer not to say = 1). The mean age was 38.59 years (SD = 12.25). Modal education was tertiary (n = 359), then secondary (n = 113), vocational (n = 9) and no formal education (n = 1). The ethnic background of participants was predominantly Caucasian (non-Hispanic) (n = 383) but also included Black or African American (n = 43), Asian (n = 21), Latino or Hispanic (n = 20), Other (n = 5), Middle Eastern (n = 4), American Indian or Alaska Native (n = 3) and Indian or South-Asian (n = 3).

Materials and procedure

Participants were asked to read a fictitious (although ostensibly genuine) newspaper article that made the following negative statements about people described as overweight: ‘most people are overweight because they have a tendency to eat junk food’; ‘fat people lack self-control, which is why they eat unhealthy food’ and ‘lack of physical exercise … is typical of overweight people because of the exertion involved’.

Experimental manipulations

Participants were then randomly presented with one of eight possible influence attempts (reflecting all possible combinations of the three independent variables) made by an influencing agent who had apparently read the article before them. The influence attempt was made either by ‘Chris Smith’ from the USA (in-group) or ‘Pehel Chatjerjee’ from India (out-group). The influencing agent was described either as a ‘medical doctor’ (high expertise in the context of being overweight and health) or a ‘Walmart employee’ (low expertise in the context of being overweight and health). The influencing agent provided an opinion about the newspaper article, which was either that the article constituted ‘prejudice’ or constituted ‘truth’. For example, the ‘prejudice’ influence attempt was, ‘The fact of the matter is, the article contains prejudiced statements. In my opinion, it is prejudiced to say that overweight people eat too much and exercise too little’.

Dependent variables

To understand what expressions people may perceive to constitute anti-fat prejudice, participants were asked to rate the degree to which 18 words (presented in random order) described the negative weight-based passages in the newspaper article. Ten of the items had theoretical links to the concept of prejudice, whilst eight had links to the concept of truth (Table 1). Responses were measured on a visual-analogue scale anchored by 0% (no agreement that the word described the passage) to 100% (the word completely described the passage).
Table 1 Loadings for one-component solution

| Item             | Loading |
|------------------|---------|
| *Prejudice       | 0.867   |
| *Biased          | 0.829   |
| *Discrimination  | 0.787   |
| *Unjustified     | 0.830   |
| *Unrealistic     | 0.787   |
| *Unfair          | 0.882   |
| *Stereotyping    | 0.778   |
| *Preconceived    | 0.683   |
| *Intolerant      | 0.843   |
| *Offensive       | 0.793   |
| Truth            | –0.871  |
| Correct          | –0.888  |
| Factual          | –0.822  |
| Legitimate       | –0.869  |
| Logical          | –0.846  |
| Valid            | –0.858  |
| Reasonable       | –0.869  |
| Objective        | –0.602  |

*Items with theoretical links to the concept of prejudice. *Items with theoretical links to the concept of truth.

Manipulation checks

Manipulation checks were included for the independent variables. For the influence attempt variable, participants were asked, ‘What was the other person’s opinion about the newspaper article?’ Response options were ‘The other person said the article was the truth’ or ‘The other person said the article was prejudice’. Fifteen participants were excluded on the basis of failing to correctly answer this manipulation check.

For the source group membership variable, participants were asked, ‘From the two names below, whom do you feel you would identify more with?’ Response options were ‘Chris Smith’ or ‘Pehel Chatterjee’. Fifty-four participants reported higher identification with the name ‘Pehel Chatterjee’ than the name ‘Chris Smith’. The main analyses were run with and without the 54 participants who reported believing that a Walmart employee involves more occupational expertise than does a medical doctor; with and without the five participants who reported being a medical doctor and with and without the one participant who reported being a Walmart employee. These analyses had no effect on the overall pattern of significant results. Thus, the participants were retained.

Exploratory variables

The Body Shape Questionnaire 8C (BSQ-8C; (40)) was then included as a control variable to capture other factors that may be related to people’s attitudes towards being overweight. The BSQ-8C is an eight-item measure that asks questions about participant body image concerns over the last 4 weeks, with response options from ‘Never’ (1) to ‘Always’ (6). A higher score is an indication of higher concern about one’s body shape. Item examples are, ‘Have you been afraid that you might become fat (or fatter)?’ and ‘Have you thought you that you are in the shape you are because you lack self-control?’ The BSQ-8C has high internal consistency (α = 0.91; (40)) which was reflected in the current sample (κ = 0.92).

Four items based on the Conscientious Responder Scale (38) were placed throughout the study to check for whether participants were paying attention to the task. Item examples are, ‘Please select “Often”’ and ‘Please slide this scale completely to 100%’. Finally, participants were asked to provide demographic information about their age, zip code, level of education, sex, if English was their first language, and ethnic background.

Results

Dependent variable formation

A high Kaiser–Meyer–Olkin measure of sampling adequacy (0.97) and statistically significant Bartlett’s test of sphericity ($\chi^2 = 9,173.24, p < 0.001$) indicated that an exploratory principal component analysis (PCA) was an appropriate dimension reduction technique for the 18 dependent variable items. A PCA with varimax rotation...
revealed two eigenvalues over 1 (12.08 and 1.24). Inspection of a scree plot suggested a one-component solution, the appropriateness of which was confirmed by a parallel analysis. A forced one-component solution accounted for a total of 67.13% of the variance.

The PCA results were used to inform the creation of a composite dependent variable. The component matrix for the final one-component solution suggested some items had strong negative loadings, whilst others had strong positive loadings. The original item loadings are shown in Table 1. The correlation between the average of the positive-loading items and the average of the negative-loading items was strong (r = −0.823). To account for items with strong negative loadings, the eight negative-loading items were reverse-scored. The mean of all items was calculated to form a highly internally consistent outcome variable: ‘Prejudice/Not Truth Rating’ (PNTR) with a Cronbach’s alpha of 0.97.

Analysis of covariance

To test the hypotheses, an Influence Attempt (‘Truth’, ‘Prejudice’) × Influencing Agent Group Membership (In-group, Out-group) × Influencing Agent Expertise (High, Low) analysis of covariance (ANCOVA) on PNTR was conducted with scores on the BSQ-8C entered as a continuous predictor. The full model was statistically significant, F(15,466) = 2.99, p < 0.05, η² = 0.09.

In this analysis, the BSQ-8C was statistically significant, F(1,466) = 8.00, p < 0.05, η² = 0.02, β = 0.13, reflecting a positive relationship between participants’ concerns about their own body in the 4 weeks before completing the study and scores on PNTR. There were no statistically significant interactions with the BSQ-8C.

A significant main effect for Influence Attempt, F(1,466) = 17.65, p < .05, η² = .04, was found. PNTR was higher if the article had first been appraised as ‘prejudice’ (M = 47.12, SE = 1.59, 95% confidence interval [44.02, 50.27]) than if it had first been appraised as ‘truth’ (M = 37.74, SE = 1.59, 95% CI = [34.63, 40.86]).

A significant interaction effect between the Influence Attempt and Influencing Agent Expertise was also found, F(1,466) = 8.97, p < 0.05, η² = 0.02. As can be seen in Figure 1, participants judged the statement to be more prejudiced (M = 49.73, SE = 2.25, 95% CI = [45.31, 54.15]) when the expert described it as prejudice and more truthful (M = 33.34, SE = 2.22, 95% CI = [28.97, 37.71]) when the expert described it as truth. In contrast, in response to a non-expert’s opinion, participants’ judgements of prejudice (M = 44.57, SE = 2.25, 95% CI = [40.15, 48.99]) and truth (M = 42.15, SE = 2.26, 95% CI = [37.71, 46.59]) did not vary. These data were consistent with H3.

Discussion

In this study, the finding of a highly internally consistent one-component PCA solution supported the claim that the concepts of ‘prejudice’ and ‘truth’ would be perceived as being inversely related to each other. When appraising negative weight-based attitudes, participants perceived ‘prejudice’ and ‘not truth’ to indicate a very similar, if not the same, single construct. This aligns with existing evidence and accords with arguments presented earlier about the perceived ‘kernel of truth’ at the core of many stereotypes (22). The results suggest that people do not believe that ‘true’ expressions constitute anti-fat
‘prejudice’; this, of course, has practical implications for anti-prejudice appeals, as discussed in the succeeding text.

The findings also provide evidence of the social influence mechanisms that may impact upon people’s prejudice perceptions. The main effect for the nature of an influence attempt reflected participants’ judgements of an anti-fat statement as more prejudiced when it was first appraised as ‘prejudice’ than when it was first appraised as ‘truth’. This main effect, however, was qualified by a significant interaction between the influence attempt and the relevant expertise of the influencing agent. Consistent with predictions, participants’ judgements were influenced by an expert but not by a non-expert. An anti-fat statement was perceived as more prejudiced when an expert had first appraised the statement to be ‘prejudice’ than when an expert had first appraised the statement to be ‘true’. This effect was not present when either type of appraisal was made by a non-expert.

Inconsistent with predictions, however, the content of the social influence appraisal was not qualified by the group membership of the influencing agent. In many ways, this is a surprising effect, as a considerable amount of previous research demonstrates the predicted group-based influence processes (e.g. (24,25)). There are, however, several possible explanations for the absence of this predicted effect. On the one hand, it may simply be that the group membership of the influencing agent is not an important factor in people’s determination of whether potentially negative statements – in this case, anti-fat statements – are prejudice or truth. No other published research has demonstrated this effect, so the current work may identify a scope condition of this group-based process. However, before rejecting this process, at least two additional factors should be considered. First, the nationality of the influencing agent may simply be irrelevant to people’s weight-based judgements. Just as the current study manipulated relevant expertise in order to test the expertise-based influence hypothesis, relevant groups (e.g. weight-based groups) may now need consideration. Second, there is mounting evidence to suggest that judgements of ‘expertise’ are, in fact, interdependent with perceptions of shared group membership and in-group prototypicality (e.g. (41)), so that a medical doctor may well have been perceived to be more in-group representative than a Walmart employee among our participants. In this way, shared group membership may simply act as a proxy for expertise. All of these possibilities point to the value of re-examination of this hypothesis in the future work, including pilot testing to determine relevant and meaningful group memberships for this specific context.

Finally, when interpreting findings of the current study, it is important to note that prejudice ratings were currently relatively low across all conditions. The overall mean for all eight experimental conditions was 42.44 (SE = 1.12, 95% CI = [40.24, 44.65]), below the scale midpoint. The implication of this result is that, currently, people did not perceive negative statements about overweight people to constitute a high degree of prejudice. This accords with the findings that, in today’s culture, people see anti-fat statements as acceptable (3,42). This exemplifies claims that the efficacy of weight-based anti-prejudice appeals must be improved.

In combination with existing knowledge that people’s attitudes guide their subsequent behaviours (43), the results of the current study highlight how people will not necessarily see their attitudes towards overweight people as prejudiced unless they are first convinced that their attitudes are untrue. Given the low efficacy of historical weight-based prejudice-reduction attempts (9), targeting people’s perceptions about the truthfulness of negative weight biases is now the fundamental challenge for future anti-prejudice appeals to address.

The current data imply that a way to reduce more successfully the prevalence of weight-based stigma is for relevant experts, like healthcare professionals, to highlight the true (versus untrue) aspects of people’s beliefs about the controllability of weight. At the same time, if perceptions of expertise and shared group membership are, in fact, interdependent (41), there may also be other potential unexpected consequences of our proposed strategy. For example, healthcare professionals who make claims that anti-fat beliefs are untruthful may simply be seen to be preaching or talking down to their audience. If so, the doctors may well be recategorized by their audience as being less in-group prototypical or even as, say, ‘elite’ out-group members. If so, the audience would remain uninfluenced (24–30). It is possible, then, that only those healthcare professionals who are perceived to possess high relative in-group prototypicality (in the form of high expertise) in the first instance can make persuasive appeals against anti-fat prejudice.

Regardless, on the basis of the current findings, it would be of interest for future anti-prejudice appeals to emphasize existing empirical research on the uncontrollable causes of overweight. This is because people who believe that weight is highly controllable also hold significantly greater negative beliefs about overweight (19). By highlighting uncontrollable factors linked to weight, it is hoped that people’s perceptions about the ‘truth’ (i.e. facts) about the causes of overweight will change. Here, it is suggested that one way to successfully influence people’s perceptions about the causes of
overweight in such a way is by delivering anti-prejudice messages via healthcare experts, like medical doctors.

Whilst the results of this study contribute to understandings about when people will perceive anti-fat attitudes to constitute ‘prejudice’, this investigation also has several limitations that would be useful to explore. In particular, and due to existing findings that anti-fat prejudice is linked to increased body dissatisfaction (44), the current study measured participants’ degree of body worry in the 4 weeks preceding participation. However, weight stigma is often also internalized (and perpetuated) by people who are themselves in the overweight or obese weight range (1,2). Thus, the possibility that people’s perceptions of what constitutes anti-fat ‘prejudice’ may be affected by, or correlated with, factors like their own body mass index cannot be ruled out. Future research should seek to clarify the current findings by taking body mass index into consideration when examining the expressions that people perceive to be ‘prejudice’. Practically speaking, another potential limitation of this study relates to its core finding that healthcare professionals can play a key role in reducing stigmatizing misconceptions about weight. This finding is problematic insofar as existing research suggests medical doctors and trainees are, themselves, not unsusceptible to possessing stigmatizing beliefs about the causes of overweight (e.g. that people with overweight are lazy; (45)). So, whilst the present data suggest that healthcare professionals may be capable of delivering persuasive appeals against negative weight-based attitudes, many people in healthcare roles are, in fact, a source of weight-based stigma (42). Perhaps this highlights a need first to reduce the anti-fat attitudes held by people in healthcare roles, before anti-prejudice appeals can persuasively rely on influence attempts from healthcare professionals. Fortunately and consistent with the findings here, there is evidence to suggest that training healthcare students with an emphasis on the controllable causes of overweight can lead to decreases in their explicit anti-fat attitudes (42).

**Conclusion**

The current study suggests that, with regard to anti-fat attitudes, people perceive that describing an attitude as ‘prejudice’ is equivalent to describing it as ‘not true’. Practically speaking, it is suggested that weight-related anti-prejudice interventions may be more persuasive if they are delivered by relevant experts from within the healthcare setting. Here, a claim about whether negative weight-based attitudes constituted ‘prejudice’ or ‘truth’ was relatively persuasive if delivered by a medical doctor. Future research should seek to clarify the persuasive ability that medical doctors may possess in challenging stigmatizing societal misconceptions about the controllability of weight.

**Acknowledgements**

We thank Dr. Elizabeth Rieger and Dr. Tegan Cruwys for their critical comments on an earlier draft.

**Funding**

This work was supported in part by the ANU Research School of Psychology and the Australian Research Council (DP160101157). Ethical permission to conduct this research was provided by the Australian National University Human Research Ethics Committee (Protocol 2016/065).

**Conflict of Interest Statement**

We confirm no conflicts of interest.

**References**

1. Puhl RM, Himmelstein MS, Quinn DM. Internalizing weight stigma: prevalence and socio-demographic considerations in US adults. *Obesity (Silver Spring)* 2018; 26: 167–175.
2. Papadopoulos S, Brennan L. Correlates of weight stigma in adults with overweight and obesity: a systematic literature review. *Obesity* 2015; 23: 1743–1760.
3. Puhl RM, Brownell KD. Bias, discrimination, and obesity. *Obes Res* 2001; 9: 788–805.
4. Pont SJ, Puhl RM, Cook SR, Slusser W. Stigma experienced by children and adolescents with obesity. *Pediatrics* 2017; 140: e20173034.
5. Pearl RL, White MA, Grilo CM. Weight bias internalization, depression, and self-reported health among overweight binge eating disorder patients. *Obesity* 2014; 22: E142–E148.
6. Canning H, Mayer J. Obesity – its possible effect on college acceptance. *N Engl J Med* 1966; 275: 1172–1174.
7. Pearl RL. Weight bias and stigma: public health implications and structural solutions. *Soc Issues Policy Rev* 2018; 12: 146–182.
8. Puhl RM, Neumark-Sztainer D, Austin SB, Luedicke J, King KM. Setting policy priorities to address eating disorders and weight stigma: views from the field of eating disorders and the US general public. *BMC Public Health* 2014; 14.
9. Alberga AS, Pickering BJ, Aix Hayden K, et al. Weight bias reduction in health professionals: a systematic review. *Clin Obes* 2016; 6: 175–188.
10. Crandall CS. Prejudice against fat people: ideology and self-interest. *J Pers Soc Psychol* 1994; 66: 882–894.
11. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity* 2009; 17: 941–964.
12. O’Brien KS, Hunter JA, Halberstadt J, Anderson J. Body image and explicit and implicit anti-fat attitudes: the mediating role of physical appearance comparisons. *Body Image* 2007; 4: 249–256.
13. Townshend T, Lake A. Obesogenic environments: current evidence of the built and food environments. Perspect Public Health 2017; 137: 38–44.

14. Varley CK, McClellan J. Implications of marked weight gain associated with atypical antipsychotic medications in children and adolescents. JAMA 2009; 302: 1811–1812.

15. Fairburn CG, Cooper Z, Doll HA, Norman P, O’Connor M. The natural course of bulimia nervosa and binge eating disorder in young women. Arch Gen Psychiatry 2000; 57: 659–665.

16. Norris T, Hawton K, Hamilton-Shield J, Crawley E. Obesity in adolescents with chronic fatigue syndrome: an observational study. Arch Dis Child 2017; 102: 35–39.

17. Brewis AA. Stigma and the perpetuation of obesity. Soc Sci Med 2014; 118: 152–158.

18. Tomiyama AJ. Weight stigma is stressful. A review of evidence for the cyclic obesity/weight-based stigma model. Appetite 2014; 82: 8–15.

19. De Caroli ME, Sagone E. Anti-fat prejudice and stereotypes in psychology university students. Procedia Soc Behav Sci 2013; 84: 1184–1189.

20. Wang SS, Brownell KD, Wadden TA. The influence of the stigma of obesity on overweight individuals. Int J Obes Relat Metab Disord 2004; 28: 1333–1337.

21. van Dijk TA. Discourse and the denial of racism. Discourse Soc 1992; 3: 87–118.

22. Augoustinos M, Walker I. Social Cognition: An Integrated Introduction. SAGE Publications: London, 1995.

23. Yan Y, Rieger E, Shou Y. Reducing the stigma associated with anorexia nervosa: an evaluation of a social consensus intervention among Australian and Chinese young women. Int J Eat Disord 2018; 51: 62–79.

24. Platow MJ, Haslam SA, Both A, et al. It’s not funny if they’re laughing: self-categorisation, social influence, and responses to canned laughter. J Exp Soc Psychol 2005; 41: 542–550.

25. Platow MJ, Voudouris NJ, Gilbert N, et al. In-group reassurance in a pain setting produces lower levels of physiological arousal: direct support for a self-categorization analysis of social influence. Eur J Soc Psychol 2007; 37: 649–660.

26. Bourgeois P, Hess U. The impact of social context on mimicry. Biol Psychol 2008; 77: 343–352.

27. Oldmeadow JA, Platow MJ, Foddy M, Anderson D. Self-categorization, status, and social influence. Soc Psychol Q 2003; 66: 138–152.

28. Platow MJ, Mills D, Morrison D. The effects of social context, source fairness, and perceived self-similarity on social influence: a self-categorisation analysis. Eur J Soc Psychol 2000; 30: 69–81.

29. Cruwys T, Platow MJ, Angullia SA, et al. Modeling of food intake is moderated by salient psychological group membership. Appetite 2012; 58: 754–757.

30. Bond R, Smith PB. Culture and conformity: a meta-analysis of studies using Asch’s (1952b & 1956) line judgment task. Psychol Bull 1996; 119: 111–137.

31. Crandall CS, Eshleman A, O’Brien L. Social norms and the expression and suppression of prejudice: the struggle for internalization. J Pers Soc Psychol 2002; 82: 359–278.

32. Hovland CI, Janis IL, Kelley HH. Communication and Persuasion: Psychological Studies of Opinion and Change. Yale University Press: Connecticut, 1953.

33. Berger J, Fiske MH, Norman RZ, Zelditch M. Status Characteristics and Social Interaction: An Expectation-States Approach. Elsevier: New York, 1977.

34. Petty RE, Cacioppo JT. Attitudes and Persuasion: Classic and Contemporary Approaches. WCB Publishers: Iowa, 1981.

35. Petty RE, Wegener DT. Attitude change: multiple roles for persuasion variables. In: Gilbert DT, Fiske ST, Lindzey G (eds). The Handbook of Social Psychology. McGraw-Hill: New York, 1998, pp. 323–390.

36. French JRP, Raven BH. The bases of social power. In: Cartwright D (ed.). Studies in Social Power. University of Michigan: England, 1959, pp. 150–167.

37. Chaiken S, Maheswaran D. Heuristic processing can bias systematic processing: Effects of source credibility, argument ambiguity, and task importance on attitude judgment. J Pers Soc Psychol 1994; 66: 460–473.

38. Marjanovic Z, Ward-Struthers C, Cribbie R, Greenglass ER. The conscientious responders scale: a new tool for discriminating between conscientious and random responders. SAGE Open 2014; 4: 215824401454596.

39. Postmes T, Haslam SA, Jans J. A single-item measure of social identification: reliability, validity, and utility. Br J Soc Psychol 2013; 52: 597–617.

40. Evans C, Dolan B. Body shape questionnaire: derivation of shortened ‘alternate forms’. Int J Eat Disord 1993; 13: 315–321.

41. Steffens NK, Haslam SA, Ryan MK, Kessler T. Leader performance and prototypicality: their inter-relationship and impact on leaders’ identity entrepreneurship. Eur J Soc Psychol 2013; 43: 606–613.

42. O’Brien KS, Puhl RM, Latner JD, Mir AS, Hunter JA. Reducing anti-fat prejudice in preservice health students: a randomized trial. Obesity 2010; 18: 2138–2144.

43. Wood W, Quinn JM, Kashy DA. Habits in everyday life: thought, emotion, and action. J Pers Soc Psychol 2002; 83: 1281–1297.

44. Murakami JM, Latner JD. Weight acceptance versus body dissatisfaction: effects on stigma, perceived self-esteem, and perceived psychopathology. Eat Behav 2015; 19: 163–167.

45. Persky S, Eccleston CP. Medical student bias and care recommendations for an obese versus non-obese virtual patient. Int J Obes (Lond) 2011; 35: 728–735.