Fat and Fit: Possible, probable, protective?

Citation: Meadows, A. (2014) Fat and fit: Possible, probable, protective? In R. Chastain (Ed.) The politics of size: Perspectives from the Fat-Acceptance Movement. Santa Barbara, CA: Praeger/ABC-Clio.

In his 1994 book '*The death of humane medicine and the rise of coercive healthism*', Petr Skrabanek suggested that 'healthism', the framing of the pursuit of health as a moral obligation, fills a void left by declining levels of religious belief in Western society, and provides an alternative route to 'salvation'. Engagement in a 'healthy lifestyle' results in avoidance of disease: those who participate, the righteous, will be rewarded; those who do not, the sinners, will be punished with ill health and untimely death.[1] In modern Western society, fat people have taken on the role of sinner. Guilty, apparently, of gluttony and sloth – two of the seven deadly sins – their fat bodies present a readily identifiable target for disapprobation, one that affords the virtuous an opportunity to shake their heads and rain down judgment on such scandalous eschewal of both individual and collective responsibility, reinforcing their own sense of moral superiority.

It is indeed possible that some fat people are guilty of these 'vices', being both greedy and lazy. This is equally true for thin people. Others are not. Whilst a critical analysis of healthism is beyond the scope of this chapter, I would like to address the misconception that all fat individuals spend their days sat on the sofa eating cheeseburgers. In particular, I will consider the case of exercise.

Fat and sedentary?

[1] Petr Skrabanek, *The Death of Humane Medicine and the Rise of Coercive Healthism* (London: The Social Affairs Unit, 1994), 17.

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Contrary to popular belief, many fat people do engage in regular physical activity. Some are casual exercisers, some hike, some belly dance, some are more hard core – running marathons and taking part in extreme multi-day endurance events, some are exercise instructors who teach daily aerobic classes, and some are semi-professional or professional athletes.[2] I'm not describing individuals with high BMI[3] due to increased muscularity – although fat people will have more muscle tissue, developed simply as a result of moving around a larger body – but people who exercise regularly and are still FAT.

The stereotype that fat people are inevitably idle arises, in part, from the widely held belief that exercise is a reliable means of achieving slimness. If this were indeed true, fat bodies, by their very existence, would represent visual proof of inactivity. However, modern research has consistently documented the limited response of body weight to physical activity. Weight loss results achieved in randomized controlled trials (the gold standard in research methods) of exercise interventions are generally poor, often in the range of only 2–3 kg and less than

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[2] Candice Buss, "Social Networking and the Fat Female Athlete: Reimagining the Female Athlete" (presentation, Annual Meeting of the National Women's Studies Association, Atlanta, GA, 29 Nov. 2011).

[3] Body Mass Index (BMI) is a measure of bodily stature, calculated as weight in kilograms divided by height in meters squared. In 1998, the World Health Organization designated cut-offs for 'underweight' (BMI less than 18.5), 'normal weight' (BMI 18.5–24.9), 'overweight' (BMI 25–29.9), and 'obese' (BMI over 30) World Health Organization, "Report of a WHO consultation on obesity. Obesity: preventing and managing the global epdiemic.," (Geneva: World Health Organization, 1998).. These categories are widely used in scientific studies of weight and health, and will be adopted here when they refer to specific research conducted based on these criteria.

one BMI unit over the course of a year.[4] This has been shown even in trials where regular, moderate to intense exercise was supervised, ruling out the possibility that people were not being truthful about how much activity they were doing.[5] A 2006 systematic review and meta-analysis looked at the results of 15 such trials that tested whether diet plus exercise resulted in more weight loss than diet alone, overall, the addition of exercise contributed only a 0.65 kg greater weight loss, or less than one and a half pounds.[6] A 2009 review identified 18 randomized controlled trials of at least six months' duration that compared diet with diet-plus-exercise in adults. Eleven of these studies, comprising a total of 861 participants, measured weight loss in kilograms. They found that, overall, weight loss in the diet-only groups at the end of study follow-up was a not particularly earth shattering 1.8 kg. The addition of exercise did increase weight loss, but only to 3.6 kg.[7] In other words, exercise contributed less than 2 kg additional weight loss, consistent with the findings in the studies of exercise alone. The other seven trials, with 775 participants between them, reported

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[4] K. Shaw et al., "Exercise for Overweight or Obesity," *Cochrane Database of Systematic Reviews*, no. 4 (2006) : 56.

[5] Ibid. Four included studies had interventions involving supervised exercise: Jeffery 1998, Neumark 1995, Stefanik 1998, and Svendsen 1993.

[6] Ibid., 58.

[7] T. Wu et al., "Long-Term Effectiveness of Diet-Plus-Exercise Interventions vs. Diet-Only Interventions for Weight Loss: a Meta-Analysis," *Obesity Reviews* 10, no. 3 (2009) : 319.

changes in BMI rather than weight loss, and the results were equally unimpressive.[8]

All told, it seems that physical activity is not a particularly effective method of shedding pounds. It's not hard to understand why. To lose one pound in weight, you'd need to create a deficit of 3500 calories[9], that is, you'd have to use 3500 calories more than you take in. Even assuming that every single calorie you expended exercising was equal to a one calorie equivalent of weight loss, a woman weighing 100 kg, for example, would have to engage in over five hours of jogging, rowing, cycling or swimming, or more than 11 hours of walking at a moderate pace to lose *one pound*. It's easy to see that the amount of physical activity that would be needed to promote significant weight loss is likely to be unrealistic for most people. But many health and fitness professionals gloss over the relatively low caloric benefit of exercise, believing it may discourage people from being active. As both public health messages and popular media continue to promote exercise for its weight loss benefits rather than for its general health benefits, many people remain unaware of the amount of exercise needed to expend a significant number of calories, and become rapidly discouraged when their efforts don't result in rapid weight loss.

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[8] Ibid.

[9] Technically, this should be 'kilocalories', but I will use the widely accepted lay version of this term, 'calorie', in this chapter.

But the true picture is even bleaker than this. In real life, a simple dose-response relationship between exercise energy expenditure and weight loss is rarely observed – that is, expending 3500 calories in exercise is unlikely to give you a one pound weight loss. The human body is very finely tuned and engages in a range of strategies to preserve itself, and the energy it needs to function, by any means necessary. Your body doesn't know that you're trying to lose weight and it compensates for the increase in energy expenditure (physical activity) by producing chemical messengers that increase appetite, driving you to eat more.[10] If you manage to resist the urge to eat more and stay on your diet, the body's internal metabolic regulation – the rate at which internal cellular processes operate and thus the amount of energy needed to complete them – must adapt. In lay terms, this is known as 'slowing down your metabolism.[11]

There are other reasons why calories expended in exercise may not translate into equivalent amounts of weight loss. For example, if you exercise regularly, you may develop additional muscle mass.[12] This means that while your body composition changes, and your overall percentage of fat mass may be reduced,

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[10] Priya Sumithran and Joseph Proietto, "The Defence of Body Weight: a Physiological Basis for Weight Regain After Weight Loss," *Clinical Science* 124, (2013) : 234-5.

[11] M. Rosenbaum and R.L. Leibel, "Adaptive Thermogenesis in Humans," *International Journal of Obesity* 34, (2010) : S48. Sumithran and Proietto, 232-3.

[12] DL Ballor and ET Poehlman, "Exercise-Training Enhances Fat-Free Mass Preservation during Diet-Induced Weight Loss: a Meta-Analytical Finding," *International Journal of Obesity and Related Metabolic Disorders* 18, no. 1 (1994) : 35.

you might not see your efforts reflected on the scales. Both type and intensity of exercise,[13] as well as age, gender, ethnicity, peri-workout nutrition, and a history of weight cycling (yo-yo dieting) may also impact on the response to exercise.[14] In addition, genes are increasingly being shown to play a part in how and why people respond differently to exercise.[15]

One example of how genetic variability can impact on response to exercise is found in the effect of the Fat Mass and Obesity-Associated (FTO) gene, which comes in two flavors (in scientific terms, it has two allelic variants): A and C. People who carry the double AA genotype are predisposed to develop higher body weights, increasing the risk of becoming 'obese' by two-thirds.[16] And in a nice double whammy, a 2010 study found that when 481 previously sedentary individuals underwent a 20-week supervised endurance exercise program, those carrying the AA form of the gene also experience two-thirds less fat loss

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[13] G.R. Hunter et al., "A Role for High Intensity Exercise on Energy Balance and Weight Control," *International Journal of Obesity and Related Metabolic Disorders* 22, no. 6 (1998) : 489.

[14] S.H. Boutcher and S.L. Dunn, "Factors That May Impede the Weight Loss Response to Exercise-Based Interventions," *Obesity Reviews* 10, no. 6 (2009) : 676.

[15] Tuomo Rankinen and Claude Bouchard, "Gene-Physical Activity Interactions: Overview of Human Studies," *Obesity (Silver Spring)* 16, suppl. 3 (2008) : S47.

[16] R.J. Loos and C. Bouchard, "FTO: the First Gene Contributing to Common Forms of Human Obesity," *Obesity Reviews* 9, no. 3 (2008) : 246.

compared with the other participants.[17] So, a genetic predisposition towards fatness may involve a number of different pathways, including a reduced body-weight response to exercise. Whilst the amount of variation in adiposity explained by this one gene is small, dozens of obesity-linkage genetic variants have now been identified,[18] and it's clear that individual responses to energy intake and expenditure are more complex than a simple 'calories in/calories out' model would suggest.

In 2012, an Australian team published a study in which they explored possible reasons for the less-than-expected weight loss during diet-plus-exercise interventions. Specifically, they were interested in the extent to which changes in metabolic rate and the composition of weight loss, i.e. fat tissue or muscle, were to blame. In their small, but rigorously conducted study, 16 'obese' men and women were put on a 600 calorie per day diet for twelve weeks, and, on top of this, were required to complete four aerobic sessions and two resistance training sessions each week, under supervision.[19] Despite the severe caloric restriction and the high-intensity, high-frequency exercise regimen, participants lost less

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[17] Tuomo Rankinen et al., "FTO Genotype is Associated with Exercise Training-Induced Changes in Body Composition," *Obesity (Silver Springs)* 18, no. 2 (2010) : 325.

[18] Felix R. Day and Ruth J.F. Loos, "Developments in Obesity Genetics in the Era of Genome-Wide Association Studies," *Journal of Nutrigenetics and Nutrigenomics* 4, no. 4 (2011) : 222.

[19] N.M. Byrne et al., "Does Metabolic Compensation Explain the Majority of Less-Than-Expected Weight Loss in Obese Adults during a Short-Term Severe Diet and Exercise Intervention?" *International Journal of Obesity* 36, no. 11 (2012) : 1473.

weight than expected, largely due to compensatory slowing of their resting metabolic rate. Given that fat people who have attempted to lose weight through diet and exercise and who report lower than expected weight loss are usually accused of lying about the extent to which they have complied with their program, the authors' conclusions are worth noting:

"Although lower-than-expected weight loss is often attributed to incomplete adherence to prescribed interventions, the influence of baseline calculation errors and metabolic downregulation should not be discounted." [20]

Fat and fit?

Despite the generally lacklustre effects of exercise on weight, large numbers of fat individuals continue to engage in regular physical activity, for a variety of reasons, including simple enjoyment. Consequently, many fat people are indeed relatively fit. A 2010 study of a subset of 4675 adults from the US National Health And Nutrition Examination Survey (NHANES I) who had performed submaximal exercise tests reported that whilst the percentage of individuals with a high level of cardiorespiratory fitness[21] was greater in 'normal-weight' than 'overweight' or 'obese' individuals, nevertheless, 87.5% and 80% of 'overweight' and 'obese'

[20] Ibid.,1478.

[21] Cardiorespiratory fitness (or aerobic fitness) is a measure of the body's ability to respond to physical demand by delivering sufficient oxygen to metabolically active tissues to support sustained physical activity. For more on CRF, see Duck-chul Lee et al., "Mortality trends in the general population: the importance of cardiorespiratory fitness," *Journal of Psychopharmacology* 24, no. Suppl. 4 (2010).

individuals, respectively, achieved a moderate to high level of fitness.[22] Because people with some medical conditions that might make exercise testing risky were excluded from this part of the study for safety reasons, it's likely that those excluded may have represented some of the least fit individuals, and so these figures may well overestimate the proportion of fit people within the population as a whole, and those percentages should be interpreted with caution. Even so, it is clearly possible to be both 'fat and fit' and large numbers of fat individuals are. Likewise, it is possible to be 'normal weight' and have a low level of fitness. I'll come back to this.

Exercise and fat health (and thin health)

So if it's not by causing weight loss that exercise makes us healthier, how does it work? Well, there are probably numerous mechanisms by which physical activity changes the body to improve health, and we're still discovering these, but one important one is via its effect on cardiorespiratory fitness. Although cardiorespiratory fitness is influenced by age, gender, health status and genetic factors, habitual physical activity level is the principal modifiable component, i.e. the one we have any control over. Regular exercise is associated with adaptations in the circulatory, respiratory and muscular symptoms that lead to increased aerobic fitness. Increased cardiorespiratory fitness is associated with reduced morbidity and all-cause mortality in men and women, *independent of age, ethnicity, adiposity, smoking status, alcohol intake, and health conditions such*

[22] Glen E. Duncan, "The "Fit but Fat" Concept Revisited: Population-Based Estimates Using NHANES," *International Journal of Behavioral Nutrition and Physical Activity* 7, (2010) : 4.

as hypertension and diabetes.[23] This effect has been shown over and over again in numerous prospective longitudinal studies: more physical activity is associated with better life expectancy.[24]

Increasing amounts of evidence also suggest that the effects of many of the diseases associated with 'obesity' can be ameliorated by lifestyle changes even in the absence of weight loss, and that 'obese' individuals are able to improve their health whilst remaining 'obese'.[25] Well-designed randomized controlled trials have demonstrated that increasing physical activity is associated with improvements in biochemical markers of health including blood pressure, cholesterol, and insulin sensitivity,[26] and that many of these changes occur relatively rapidly – prior to any effects of increased physical activity on weight status. In fact, the benefits are accrued even if people don't lose any weight, and can even be seen in people who *gain* weight.[27]

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[23] Duck-chul Lee et al., "Mortality Trends in the General Population: the Importance of Cardiorespiratory Fitness," *Journal of Psychopharmacology* 24, suppl. 4 (2010) : 28.

[24] James Woodcock et al., "Non-Vigorous Physical Activity and All-Cause Mortality: Systematic Review and Meta-Analysis of Cohort Studies," *International Journal of Epidemiology* 40, no. 1 (2011) : 121.

[25] Linda Bacon and Lucy Aphramor, "Weight Science: Evaluating the Evidence for a Paradigm Shift," *Nutrition Journal* 10, (2011) : 2.

[26] Shaw et al., 1.

[27] Bacon and Aphramor, 6.

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Strikingly, moderate to high cardiorespiratory fitness offsets at least some of the increased risk typically associated with fatness. Large epidemiological studies using objective measurements of cardiorespiratory fitness frequently report that 'overweight' or 'obese' individuals with high fitness levels have better long-term outcomes than 'normal weight' but unfit individuals.[28] And encouragingly, a systematic review of prospective longitudinal studies found a clear dose-response relationship between fitness and morbidity and mortality, with the greatest benefits associated with relatively small improvements in fitness that moved individuals out of the 'least fit' group.[29] So if you're currently in the nowhere-near-fit category, you can see significant health improvements by just getting yourself moving. And if you do, you'll be glad to know, that when researchers followed a group of people over time, they found that unfit individuals who became fit had a relative risk of all-cause mortality on a par with fit individuals who became unfit, and this risk was lower than for those individuals who have stayed unfit (although it was still higher than for those who were fit at baseline and remained so at follow-up.[30]

Even more surprisingly, perhaps, the relationship between 'obesity' and its 'related diseases' isn't actually that strong, although you wouldn't know from the ever-increasing hysteria in both the science and the lay literature. Whilst an

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[28] Lee et al., 28.

[29] Woodcock et al., 121.

[30] Lee et al., 29.

enormous amount of epidemiological evidence does show an association between 'obesity' and morbidity and mortality,[31] these studies tend not to control for a range of confounding variables – other things that might affect the results –including physical activity level, fitness, or a history of weight cycling (otherwise known as yo-yo dieting). What's more, when possible confounders *are* corrected for, the association between obesity and disease is often significantly reduced or eliminated,[32] meaning that it could be these other factors, rather than the weight itself, that are behind the health issues.

Health At Every Size®

In light of the growing body of evidence that weight loss is neither necessary for improved health, or indeed is even conducive to reducing morbidity and mortality risk, a new movement has emerged promoting 'Health At Every Size' (HAES)®.[33] The HAES paradigm simply states that if an individual chooses to improve their health, whatever their size, the most useful way of achieving this is to adopt healthy behaviors, and that the use of body weight or BMI as a proxy for health, is neither reliable nor useful. Scientific evidence supporting this stance continues to emerge. For example, a 2012 analysis of nearly 12,000 individuals

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[31] Katherine M. Flegal et al., "Cause-Specific Excess Deaths Associated with Underweight, Overweight, and Obesity," *Journal of the American Medical Association* 298, no. 1 (2005) : 2031.

[32] Paul Campos et al., "The Epidemiology of Overweight and Obesity: Public Health Crisis or Moral Panic?" *International Journal of Epidemiology* 35, no. 1 (2006) : 56.

[33] Bacon and Aphramor, 8.

from the NHANES III cohort found that lifestyle was more important than weight for long-term outcomes.[34] The authors considered four 'healthy habits': getting five or more servings of fruit and vegetables daily, exercising for at least 30 minutes, three times a week, drinking alcohol only in moderation, and not smoking. For people with an unhealthy lifestyle – no healthy habits, weight was indeed important, with heavier individuals facing a significantly increased risk of all-cause mortality (compared with a 'normal weight' individual who engaged in all four habits); but for each health behavior added to one's lifestyle, the hazard ratio for all-cause mortality was reduced. Including just one healthy habit into your lifestyle removed most of the differences in risk between the three weight groups. With three healthy habits, the risk for 'overweight' and 'obese' individuals fell below that of even a 'normal weight' individual who did not achieve any of the habits; adopting all four healthy habits resulted in optimal and identical long-term outcomes, *irrespective of weight*. The importance of lifestyle factors over weight for long-term health outcomes is supported by a recently published prospective cohort study of nearly 72,000 Swedish men and women between the ages of 45 and 83.[35] When followed up for an average of 13 years, people who ate five or more servings of fruit and vegetables daily had the same

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[34] Eric M. Matheson, Dana E. King, and Charles J. Everett, "Healthy Lifestyle Habits and Mortality in Overweight and Obese Individuals," *Journal of the American Board of Family Medicine* 25, no. 1 (2012) : 13.

[35] Andrea Bellavia et al., "Fruit and Vegetable Consumption and All-Cause Mortality: a Dose-Response Analysis," *American Journal of Clinical Nutrition* 98: no. 2 (2013) : 454.

long-term survival rates whether they fell into the 'normal weight' or 'overweight' categories.[36]

Fat and not fit?

Although it is clearly possible to be both fat and fit, and this state of affairs confers many health advantages, it is true that not all fat people have a good level of cardiorespiratory fitness. As with thin people, some will engage in regular physical activity whereas others will be more sedentary, although some will manage to maintain adequate levels of fitness even in the absence of exercise – having been blessed with 'good genes'. Cross-sectional studies and national statistical data do tend to show an inverse relationship between BMI and both physical activity level[37] and cardiorespiratory fitness[38] – that is, as BMI increases, the less likely individuals are to exercise regularly or maintain adequate levels of fitness. It should be noted, however, that these findings are not probative of a causal link – that fat people are fat because they do not exercise, and a number of alternative explanations for this relationship are possible.

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[36] Andrea Bellavia, e-mail message to author, November 29, 2013.

[37] Centers for Disease Control and Prevention, *Adult Participation in Aerobic and Muscle-Strengthening Physical Activities - United States, 2011*, Morbidity and Mortality Weekly Report no. 62, 3 May 2013, http://www.cdc.gov/mmwr /preview /mmwrhtml/mm6217a2.htm?s_cid=mm6217a2_w

[38] Susan G. Lakoski et al., "Impact of Body Mass Index, Physical Activity, and Other Clinical Factors on Cardiorespiratory Fitness (from the Cooper Center Longitudinal Study)," *American Journal of Cardiology* 108, no. 1 (2011) : 37.

On a pragmatic level, a range of practicalities may make it more difficult for the larger body to engage in many forms of physical activity – from the absence of suitable clothing and equipment, to the lack of understanding of the biomechanics of larger bodies amongst exercise professionals – making many attempts unnecessarily uncomfortable or even painful, and dissuading further participation.[39] In addition, many fat people have spent their lives repeatedly engaging in cycles of diet and exercise while attempting to lose weight. They may have forced themselves to endure high-intensity activities that they disliked for the purpose of burning more calories. Yet, as noted above, exercise, in the amounts achievable by the average working individual, are unlikely to lead to significant weight loss. Thus, exercise becomes penance for being fat, yet provides little, if any, return in the form of weight loss, and many fat individuals have come to hate the entire process. Televisual reality shows such as The Biggest Loser also foster the notion that exercise must be punitive, with participants frequently shown vomiting, crying, and sustaining overuse injuries, but forced to continue regardless, usually amidst a torrent of verbal abuse from the show's trainers. Recent studies have shown, not entirely surprisingly, that watching The Biggest Loser tends to worsen viewers' attitudes towards exercise,[40] and may discourage individuals from engaging in physical activity.[41]

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[39] Jaclyn Packer, "The Role of Stigmatization in Fat People's Avoidance of Physical Exercise," *Women & Therapy* 8, no. 3 (1989) : 56-7.
[40] Tanya R. Berry et al., "Effects of Biggest Loser Exercise Depictions on Exercise-Related Attitudes," *American Journal of Health Behavior* 37, no. 1 (2013) : 100.

[41] Tucker Readdy and Vicki Ebbeck, "Weighing In on NBC's The Biggest Loser," *Research Quarterly for Exercise and Sport* 83, no. 4 (2013) : 584.

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As noted above, the greatest benefits of increased fitness are accrued in individuals who change from being sedentary to engaging in any physical activity. Thus, the idea that extreme exertion is necessary in order to reap health benefits is neither true, nor helpful.

But perhaps more importantly, many fat individuals may avoid participation in formal, or even informal, exercise due to embarrassment.[42] Experience of weight stigma has been linked to avoidance of exercise,[43] and to less frequent engagement in moderate or strenuous exercise.[44] What's more, experiential avoidance and weight self-stigma are significant predictors of health-related quality of life, and mediate the relationship between BMI and health-related quality of life.[45] In addition, weight self-stigma is inversely related to the pleasure and post-exercise energy levels reported by 'obese', but not 'non-obese',

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[42] Sophie Lewis et al., "How Do Obese Individuals Perceive and Respond to the Different Types of Obesity Stigma That they Encounter in Their Daily Lives? A Qualitative Study," *Social Science & Medicine* 73, no. 9 (2011) : 1354.

[43] Dorothy L. Schmalz, "'I Feel Fat': Weight-Related Stigma, Body Esteem, and BMI as Predictors of Perceived Competence in Physical Activity," *Obesity Facts* 3, no. 1 (2010) : 18. Lenny R. Vartanian and Jacqueline G. Shaprow, "Effects of Weight Stigma on Exercise Motivation and Behavior: a Preliminary Investigation among College-Aged Females," *Journal of Health Psychology* 13, no. 1 (2008) : 131.

[44] Ibid.

[45] Jason Lillis, Michael E. Levin, and Steven Hayes, "Exploring the Relationship between BMI and Health-Related Quality of Life: a Pilot Study of the Impact of Weight Self-Stigma and Experiential Avoidance," *Journal of Health Psychology* 16, no. 5 (2011) : 1.

women.[46] Activities such as fitness classes may include instructors openly stigmatizing fat bodies and encouraging participants to work harder to alleviate or prevent such a fate befalling them. Even moderate, non-gym-based activities such as walking and cycling can be traumatic experiences for the fat individual. Although few quantitative data on the prevalence of actual anti-fat stigmatization whilst exercising in public are available in the peer-review literature, numerous anecdotal accounts are available of people having things thrown at them, being verbally insulted, or even mooed at,[47] for the sin of exercising in public whilst fat.[48] And the recent interest in weight stigma has produced a slew of research papers that suggest the most common forms of stigmatization occur in public places – shops, restaurants, on the street, and so on.[49] Sadly, abusive remarks

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[46] Panteleimon Ekkekakis, Erik Lind, and Spiridoula Vazou, "Affective Responses to Increasing Levels of Exercise Intensity in Normal-Weight, Overweight, and Obese Middle-Aged Women," *Obesity (Silver Spring)* 18, no. 1 (2010) : 79.

[47] While researching this chapter, I even came across a Facebook page with the charming name, 'Yelling "Moo" at fat people'. Hopefully, following complaints to Facebook administrators, this page will no longer exist at time of going to press.

[48] Jean Braithwaite, "Fat Pride," *The Sun*, no. 379, July 2007, http: //thesunmagazine.org /issues/379/fat_pride. Ragen *Chastain*, "To the Guys Who Threw Eggs at Me Tonight," *Dances with Fat* (blog), 23 Aug. 2013, http://danceswithfat.wordpress.com/2013/08/23/to-the-guys-who-threw-eggs-at-me-tonight/. Vivian F. Mayer, "The Fat Illusion," in *Shadow on a Tightrope: Writings by Women on Fat Oppression*, eds. Lisa Schoenenfielder and Barb Wieser (Iowa City: Aunt Lute Book Company, 1983), 8. Lonie McMichael, *Acceptable Prejudice? Fat, Rhetoric and Social Justice*. Nashville: Pearlsong Press, 2013, 34.

[49] Deborah Carr and Michael A. Friedman, "Is Obesity Stigmatizing? Body Weight, Perceived Discrimination, and Psychological Well-Being in the United States," *Journal of Health and Social Behavior* 46, no. 3 (2005) : 251. Mark L. Hatzenbuehler, Katherine M. Keyes, and Deborah S. Hasin, "Associations between Perceived Weight Discrimination and the Prevalence of Psychiatric Disorders in the General Population," *Obesity* 17, no. 11 (2009) : 2036. R.M. Puhl, T.

from strangers, being pointed at and laughed at by groups of people, and having insults hurled out of passing cars whilst out walking in public are not rare occurrences.[50] In one study of over 2000 individuals, 10% even reported being physically assaulted because of their weight.[51] And despite the fact that around two-thirds of individuals in the US are now classified as 'overweight' or 'obese' (and similar rates in other Western countries), the problem of weight stigma appears to be getting worse.[52] Thus, even for those who have not directly experienced these types of interactions, the not unreasonable fear that they may be subject to this kind of behavior is a very real deterrent to exercising in public.[53] The internet and social media present a new outlet for anti-fat attitudes, and photos or videos of fat people exercising attract hoards of 'trolls', who post everything from the most obscene insults to death threats in response.[54] Both

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Andreyeva, and K.D. Brownell, "Perceptions of Weight Discrimination: Prevalence and Comparison to Race and Gender Discrimination in America," *International Journal of Obesity* 14, no. 10 (2006) : 997.

[50] Puhl and Brownell, 1806, 1808. The measure used in this study was the Stigmatizing Situations Inventory (Myers and Rosen, 1999). It comprises 11 situational subscales, including healthcare, comments from children, family, being stared at, and receiving nasty comments from others (friends, strangers, etc). Items include "Groups of people pointing and laughing at you in public," "When walking outside, having people drive by and laugh or shout insults," and "Being hit, beaten up, or physically attacked because of your weight."

[51] Ibid.

[52] Tatiana Andreyeva, Rebecca M. Puhl, and Kelly D. Brownell, "Changes in Perceived Weight Discrimination among Americans, 1995-1996 through 2004-2006," *Obesity* 16, no. 5 (2008) : 1132.

[53] Lewis et al., 1352.

[54] Lonie McMichael, *Talking Fat: Health vs. Persuasion in the War on Our Bodies*. (Nashville: Pearlsong Press, 2012), 12. McMichael (2013), 78.

individuals and organizations have used pictures of fat people engaging in exercise as a highly derogatory source of humor.[55] Fat athletes are generally ignored or sidelined by the media, and attempts to show fat individuals engaging in healthy behaviors are often met with accusations that the source is "promoting obesity".[56] Thus, fat individuals, of all ages, lack role models on whom they can base their own aspirations.

The aversion to showing exercising fat people in a positive light, or at all, for that matter, has far-reaching and paradoxical implications.[57] Health psychology research has shown that Bandura's social cognitive theory,[58] accounts for a significant proportion of the variance between individuals with respect to a range of health behaviors, including participation in physical activity.[59] The major determinant of social cognitive theory is self-efficacy, an individual's belief in their ability to successfully accomplish an activity, which has been shown to be one of the most robust psychosocial predictors of physical activity and

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[55] Ragen Chastain, "Miami City Ballet and What Not to Do," *Dances with Fat* (blog), 25 Nov. 2012, http://danceswithfat.wordpress.com/2012/11/25/miami-city-ballet-and-what-not-to-do/.

[56] Ragen Chastain, "The 'Promoting Obesity' Myth," *Dances with Fat* (blog), 9 Dec. 2011, http://danceswithfat.wordpress.com/2011/12/09/the-promoting-obesity-myth/.

[57] Lewis et al. 1353.

[58] Albert Bandura, *Self-Efficacy: the Exercise of Control*. (New York: W.H. Freeman & Company, 1997).

[59] Barbara Resnick et al., "Path Analysis of Efficacy Expectations and Exercise Behaviour In Older Adults," *Journal of Advanced Nursing* 31, no. 6 (2000) : 1309.

exercise.[60] Interventions that lead to increased physical activity self-efficacy result in increased and more sustained participation in exercise.[61] Not seeing a single example of somebody who looks like you taking part in sports and other fitness activities will do nothing to foster self-efficacy, and is likely to be associated with reduced participation among fat individuals.

Fat and public health messages

Although exercise is unlikely to lead to weight loss in the majority of participants, there is a strong argument for public health messages to promote exercise and physical activity in its own right, for *all* people, not just the fat ones. Cross-sectional studies in both healthy and disease populations have found that increased physical activity level is associated with a range of physical, cognitive and emotional improvements and with improved health-related quality of life.[62] But which comes first? It could be that happy healthy people exercise more, or it could be that exercise makes people happy and healthy. In all likelihood, it's probably a virtuous circle in which both of these are true. But a recent randomized controlled trial conducted in 430 post-menopausal 'overweight' and 'obese' women (BMI 25.0–43.0) who were sedentary at the start of the study,

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[60] Adrian E. Bauman et al., "Correlates of Physical Activity: Why Are Some People Physically Active and Others Not?" *Lancet* 380, no. 9838 (2012) : 260.

[61] S.L. Williams and D.P. French, "What Are the Most Effective Intervention Techniques for Changing Physical Activity Self-Efficacy and Physical Activity Behaviour – and Are They the Same?" *Health Education Research* 26, no. 2 (2011) : 312.

[62] Raphaël Bize, Jeffrey A. Johnson, and Ronald C. Plotnikoff, "Physical Activity Level and Health-Related Quality of Life in the General Adult Population: a Systematic Review," *Preventive Medicine* 45, no. 6 (2007): 409.

showed that both physical and mental aspects of health-related quality of life were improved with exercise in a dose-dependent manner.[63] In other words, the more people exercised, at least within the levels considered in this study (up to 150% of the National Institute for Health guidelines for physical activity), the better their quality of life. That is, exercise makes people happy and healthy, or at least happier and healthier. The study also showed that these improvements in health occurred *independent of weight loss*.

The continued focus of public health efforts on the promotion of weight loss as a primary goal may be not only ineffective, but also stigmatizing and unhelpful. In response to the difficulties and prejudiced faced by many fat exercises, the Fit Fatties Forum[64] was set up by two fat activists: Ragen Chastain, a dancer, choreographer, and writer, and Jeanette DePatie, a certified fitness instructor who teaches regular aerobic classes and runs marathons and triathlons in her spare time. Both of them are fat. The Fit Fatties Forum is a HAES-friendly space where people of all sizes and abilities with in interest in exercise, can receive support, connect with others, and make friends, without a focus on weight loss. The responses of many non-fat individuals to the existence of such a space is indicative of the harm engendered by the current weight-based paradigm. In her blog 'Dances with Fat', Ms. Chastain has catalogued some of the more printable

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[63] Corby K. Martin et al., "Exercise Dose and Quality of Life: a Randomized Controlled Trial," *Archives of Internal Medicine* 169, no. 3 (2009) : 269.

[64] Fitfatties.ning.com

responses she receives when publicizing the Fit Fatties Forum. The following is a typical example that highlights the extent of the problem:

"I looked at your fat people forum – I think you people need to stop running marathons and start focusing on losing weight." [65]

Further, from a public health perspective, weight-based messages may miss a significant proportion of the 'normal weight' population who are at increased risk of ill health due to their lifestyles, whilst targeting a proportion of the 'overweight and obese' population who are not. Increasing engagement in exercise and physical activity would be a more useful target for public health policies and interventions. Weight loss may or may not be a by-product of such activities, but is not a necessary prerequisite for individuals to achieve the health benefits associated with physical activity, including higher fitness levels, better metabolic health, greater self-efficacy, improved mood, and higher health-related quality of life.

In a 2009 review entitled 'The future of obesity reduction: beyond weight loss', Ross and Bradshaw stated that:

"… a preoccupation with weight loss as the primary determinant of successful obesity reduction is not supported from either a biological or behavioral perspective. … Little support exists for the position that weight loss is an absolute requirement if obese individuals are to experience a health benefit, or that a weight reduction of ≥5% is a threshold that must be achieved to reduce obesity-related risks to health. On the contrary, several lines of evidence underscore the health

[65] Ragen Chastain, "Holy Mixed Messages Fatman," *Dances with Fat* (blog), 15 Dec. 2012, http://danceswithfat.wordpress.com/2012/12/15/holy-mixed-messages-fatman/.

benefits of lifestyle-based strategies that include an increase in physical activity combined with a healthy diet, independent of changes in weight."[66]

The move away from a focus on weight loss as a means to achieve health is gaining traction among many researchers and clinicians, yet its assimilation into the mainstream has been slow, possibly due to powerful vested financial and professional interests. Yet the current 'obesity epidemic' hysteria is helping nobody, of any weight. It is time for a paradigm shift. Until our governments and our medical professionals take on this message, we alone can advocate for and champion our own health agendas.

Conclusion

Despite current public health messages that fat people need to engage in exercise, automatically assuming that they currently do not, society at large is not kind to the fat exerciser. If public health messages are indeed intended to improve the health of the public, a more useful approach should be to work to reduce the stigma so ingrained in our society and to promote physical activity for *all* bodies. People of all shapes and sizes will profit from the numerous benefits that physical activity can bring, not just in terms of fitness and improved physical health, but also in improved psychosocial wellbeing, occasions shared with friends and colleagues, immersion in nature, and the like. One of the many casualties of the current 'War on Obesity' is that we appear to have forgotten how to move our bodies for the sheer enjoyment of it. This needs to change.

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[66] Robert Ross and Alison J. Bradshaw, "The Future of Obesity Reduction: Beyond Weight Loss," *Nature Reviews. Endocrinology* 5, no. 6 (2009) : 319-20.

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Finally, as the modern-day versions of gluttony and sloth – eating fast food and abstaining from circuit classes, either in actuality or perceived – appear to have become a measure of human decency and worth, it might behove us to remember that pride, or hubris – the desire, amongst other things, to be more important or attractive than others – has throughout history been considered the most serious of the deadly sins.

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