

THE ANTHROPOLOGY OF OVERWEIGHT, OBESITY AND THE BODY

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Throughout most of human history, obesity was not a common health problem. It was not even a realistic possibility for most people. Today, particularly in affluent societies, obesity is common and has increased dramatically in recent years.

For example, among American adults obesity increased 61% from 1991 to 2000. Most recent estimates classify 63% of the adult US population as overweight and 29% as obese. Internationally, over 300 million adults are obese and 700 million are considered overweight (Nishida and Mucavele 2005).

Because obesity and overweight involve the interaction of genetic traits with culturally patterned behaviors and beliefs, the causes of obesity can best be understood in the context of human cultural and genetic evolution. Behaviors that were adaptive in the context of past food scarcities may be maladaptive today in the context of affluence and food surpluses.

Genetic and cultural traits related to obesity, remarkably common in human societies, are evolutionary products of similar selection processes related to past food scarcities. In a modern context of food abundance, such cultural and genetic traits cause some people to add dangerous levels of fat tissue to their bodies. The increasing prevalence of overweight and obesity in the United States, especially in children, has risen to national attention and concern; in fact, it has been called an "epidemic."

Unfortunately, existing biomedical treatments for these conditions are not effective and the risks for obesity-caused chronic diseases are high. Furthermore, obesity prevention poses a special challenge for Public Health officials since meeting this challenge necessitates a more thorough understanding of multiple and complex factors of causation.

An Anthropological Model

This article uses an anthropological model of culture to explore why and how societies have encouraged behaviors and beliefs that predispose individuals to overweight.

This approach has advantages over the commonly used undifferentiated concept of "environment" for generating hypotheses about behavioral causes of obesity. It is particularly useful for understanding the social epidemiological distribution of obesity and minimizing the widespread notion that obesity represents psychological failure.

We begin with two questions: Why do people find it so hard to reduce their intake of fat and sugar even when the medical risks and benefits of a dietary change are well known? Why do people find it so hard to exercise?

Anthropology suggests that the answer to these questions is a complex combination of near-universal, in-born preferences for sugar and fat. These calorically dense substances were rare in the pre-agricultural world where prey animals often carried little extra fat and natural sugars (honey, ripe fruit) were very limited. Such food preferences are coupled with cultural practices that are salient in shaping food preferences and activity patterns from a young age (Turner et al. 2008). Like many aspects of human biology and behavior, the ultimate answers are linked to our evolutionary heritage.

Contexts of Food Scarcity and Abundance

Many global health problems are related to food: some people are underfed and some people are over-stuffed. This striking inequality did not always exist. In most of prehistory and history, food shortages were common; in fact, seasonal hunger was a virtually inevitable fact of human life. Because food shortages affect health, survival and reproduction, they were a powerful evolutionary force. Seasonal food availability results in a seasonal cycle of weight loss and weight gain in both hunting and gathering and agricultural societies. Approximately 12,000 years ago, some human groups shifted from a food foraging economy to one of food production. This economic transformation allowed the evolution of complex civilization. The archeological record clearly shows that agriculture was often associated with nutritional stress, poor health, and diminished

stature, whether due to tooth decay from increased consumption of sugars and carbohydrates, or an increase in infectious disease from more crowded living conditions, or actual food scarcity.

Anthropological research has demonstrated that food foragers are generally healthier than many less industrialized populations relying on agriculture – at least before they were displaced from their original territories. Although our food foraging ancestors suffered risks of periodic food shortages, they commonly enjoyed high quality diets, low exposure to infectious diseases, and high levels of physical fitness. In addition, studies of traditional hunting and gathering populations report no obesity.

Since food shortages were ubiquitous for humans under natural conditions, selection favored individuals who could effectively store calories in times of surplus. For most societies, such fat stores would be called on at least every two to three years. The evolutionary scenario indicates that females with greater energy reserves in fat would have a selective advantage over their lean counterparts in withstanding the stress of food shortage, not only for themselves, but for their fetuses or nursing children.

In this evolutionary context the usual range of human metabolic variation must have produced many individuals with a predisposition to become obese; yet such individuals would never have the opportunity to do so. Furthermore, in this context there could be little or no natural selection against such a tendency towards fatness. Selection could not provide for the eventuality of continuous surplus because it had simply never existed.

In contrast to a history of scarcity, developed societies like the contemporary United States have created an obesogenic environment, wherein the physical, economic, social and cultural environments encourage a positive energy balance in their population. The idea of a “nutrition transition” is one way to explain the emergence of the obesogenic environment (Popkin 1994). According to this theory, as societies undergo globalization, westernization and urbanization, their diets change dramatically. Post-transition diets are marked by energy dense foods with high levels of quickly digestible carbohydrates as well as high levels of dietary fat.

Three basic cultural changes accompany such nutrition transition:

1) Diets decrease in fiber intake and increase in fat and carbohydrate consumption, particularly in sugar and its substitutes such as high-fructose corn syrup. The industrialized food system adds calories and encourages increased food portion size due to consumer demand and higher profit opportunities.

2) The nutrition transition is associated with decreased energy expenditures related to work, modes of transportation, recreation, and daily activities. Because technological changes have reduced requirements for human labor, people in developed societies must burn energy to prevent overweight and obesity through daily workouts rather than daily work.

3) From the cultural perspective of the populations undergoing the nutrition transition and economic modernization, increasing body size may initially be seen as a good thing (rather than a health problem) but subsequently fat becomes a symbol of lower class status.

The Problems of Obesity and Overweight

Throughout most of human history, obesity was never a common health problem. Today it is common and has increased dramatically in recent years. Not only are overweight and obesity relatively common conditions in our society, but they are also extremely complex and intractable.

Obesity is a serious public health problem not because it is a disease itself but because it is associated with major causes of morbidity and mortality from chronic diseases. These include cardiovascular disease, type-two diabetes mellitus, hypertension, and some cancers. Cardiovascular disease is the most common cause of death in developed countries.

The direct relationship between overweight and health is under debate, as physical activity may actually be more important to health than body weight. On the individual level, obesity and overweight bring with them an enormous amount of personal psychological pain. The fact that the obese are subjected to significant social and economic discrimination is well documented.

Fat is extraordinarily difficult to shed because the body guards its fat stores. The remarkable failure of diet therapies has made some researchers rethink the commonsensical theory of obesity as being simply caused by overeating. Clinical evi-

dence of the past forty years simply does not support such a simplistic notion. Increasingly, obesity and overweight are being linked to physical inactivity and metabolic pathways that lead to excess fat storage related to modern diets.

Even in the absence of good scientific data about the effectiveness of diet therapy, the diet and weight loss industry in the United States is remarkably successful in capturing the hope and money of people who perceive themselves to be overweight. This industry thrives because of a complex of cultural beliefs about the ideal body and sexual attractiveness rather than medical advice and the prevention of chronic diseases per se. The American cultural concern about weight loss and the positive value placed on slenderness among American middle and upper class women is difficult to over-emphasize. Chernin (1985) has referred to this cultural theme as an "obsession" and the "tyranny of slenderness." Within this context, it is impossible to claim that overweight and obesity are purely medical issues.

Changing Definitions of Obesity

Many basic scientific issues regarding obesity are, in fact, controversial. Obesity is simply "excess adipose tissue," but most measures in medicine and public health cannot measure this directly. Definitions of obesity and overweight are partly debated because they are based upon inferred definitions of normality or "ideal" body proportions. Current medical literature utilizes Body Mass Index (BMI) defined as body weight divided by height squared. BMI (W/H^2) is correlated with total body fat, and a BMI greater than 30 is generally considered obese.

However, muscular athletes have high BMIs because muscle mass weighs more than fat. BMI is currently used in clinical settings for individual patients even though it was developed as a population-level measure; some scholars believe this is an inappropriate use. Also, BMI measures may not be appropriately valid in all populations. Increased risk of chronic disease affects some Chinese and South Asian populations at lower BMIs than among European populations.

An important and often neglected dimension to defining obesity involves the distribution of fat around the body trunk or on the limbs. Central or truncal body fat distribution is closely correlated with serious chronic diseases like cardiovascular disease, while peripheral body fat in the hips and limbs does not carry similar medical risks. In other words, peripheral body fat typical of women

appears to be epidemiologically benign. Because of this clinically important distinction, measures of fat distribution like waist to hip ratio (WHR), wherein lower WHR indicates lower risk of chronic disease consequences, are a valuable addition to the measurement of obesity.

Increased morbidity due to disease is seen at both extremes of the BMI spectrum. Very low BMI—such as is seen in parts of the developing world like India—increases risk of deaths due to infectious diseases because of a lack of energy reserves. At the higher end, BMI is linked to chronic diseases including coronary heart disease, high blood pressure, stroke, type-two diabetes mellitus, and a range of cancers. Both high and low BMIs are associated with poor health, whereas "normal" levels of adiposity (fat) should include a range of body types. It is particularly important to note that levels of physical inactivity are linked to poor health outcomes more strongly than are body size or weight; in other words, it is possible to be fit and fat.

Biological and Cultural Perspectives on the Body

The nonrandom social distribution of adiposity within and between human populations may provide a key to understanding obesity. In addition to the circumstances of the nutrition transition discussed above, three features of the social distribution of obesity are particularly cogent for an anthropological analysis: one, a gender difference in the total percent and site distribution of body fat, as well as the prevalence of obesity; two, the concentration of obesity in certain ethnic groups; and three, a powerful and complex relationship between social class and obesity. Any useful theory concerning the etiology (origins) of obesity must help account for these social epidemiological patterns.

Sexual Dimorphism Humans show only mild sexual dimorphism in stature: males are only 5 to 9 percent taller than females. Men are larger than women in height and total body mass, but women have more subcutaneous fat. However, the greatest degree of sexual dimorphism is found in the distribution of fat tissue, with women having much more peripheral fat in the legs and hips. This difference is epidemiologically important. With the same BMI, the greater proportion of peripheral fatness in females may be associated with reduced morbidity and enhanced fertility, whereas more central body fat may partly explain higher cardiovascular disease rates and lower life expectancies in males.



Gender differences in prevalences of obesity in 14 populations by general industrial development. The unbroken line demarcates equal male-female obesity prevalences. The broken line indicates an apparent distinction in gender proportions of obesity in developed and underdeveloped countries. From Brown, P.J., and M. Konner, *An Anthropological Perspective on Obesity*. In R. J. Wurtman, and J. J. Wurtman, eds., *Human Obesity*, *Annals of New York Academy of Sciences* 499:29-46. Copyright 1987. Reprinted with permission.

Sex differences are also seen in the prevalence of obesity. Data from the 14 population surveys shown in Figure 2 indicate that in all of the studies females have a higher prevalence of obesity than males. Despite controversies concerning measurement, a greater risk for obesity for females appears to be a basic fact of human biology.

Evolution has favored female ancestors who are able to retain surplus body fat, thus improving their ability to bear and feed children even in times of nutritional scarcity. Peripheral body fat is mobilized after being primed with estrogen during the late stages of pregnancy and lactation. In addition, a minimal level of female fatness increases reproductive success because of its association with regular cycling as well as earlier menarche. Fat metabolism is influenced by hormones including reproductive hormones and insulin.

Pregnancy and lactation represent serious and continuing energy demands on women in societies that have not undergone the demographic transition – the historical shift from high to low fertility rates associated with the reduction of mortality due to infectious disease. In underdeveloped societies with high fertility, higher numbers of pregnancies and longer periods of breast feeding place high energy demands

upon women, especially if they cannot supplement their diet. As a result, such women suffer greater risk of protein-energy malnutrition. Conversely, with fewer pregnancies and the reduction of breast-feeding, women in developed societies have less opportunity to mobilize peripheral fat stores and suffer greater risk of obesity (Worthman et al. 1989).

Ethnicity The idea that particular populations have high rates of a genotype that predisposes individuals to obesity and related diseases is not new, and is supported by a convincing body of adoption and twin data, as well as work focusing on obesity-prone populations like the Pima Indians. This is evidence of genetic predisposition to obesity. In the United States, ethnic groups with elevated rates of obesity include: African Americans (particularly in the rural south), Mexican Americans, Puerto Ricans, and Native Americans. Given that these groups are often over-represented in lower socioeconomic strata, it may be difficult to distinguish the causal effects of class versus ethnicity. The fact that certain ethnic groups have high rates of obesity is not easy to interpret because of the entanglement of the effects of class with genetic heredity, cultural beliefs, and opportunities for exercise.

Social class Socioeconomic status is a powerful predictor of the prevalence of obesity in both modernizing and affluent societies, although the direction of the association varies with the type of society. In developing countries there is a strong and consistent positive association of social class and obesity for men, women, and children. Correspondingly, there is an inverse correlation between social class and protein-calorie malnutrition. On the other hand, it has long been recognized that in heterogeneous and affluent societies like the U.S., there is a strong inverse correlation of social class and obesity for females. The association of obesity and social class among women in affluent societies is not constant through the life cycle. Garn and Clark (1976) have demonstrated a pattern of reversal in which economically advantaged girls are initially fatter than their poor counterparts. For females, social class remains the strongest social epidemiological predictor of obesity.

Cultural Perceptions of Body Size

From an anthropological perspective, the most important aspects of culture relating to body weight may be cultural symbols, beliefs and values. Aspects of ideology relevant to the

etiology of obesity include the symbolic meaning of fatness, ideal body types, and perceived risks of future food shortages. Fatness is symbolically linked to psychological dimensions such as “self worth” and sexuality in many of the world’s societies, but the nature of that symbolic association is not constant. In mainstream U.S. culture, obesity is socially stigmatized, but for many cultures of the world, fatness is viewed as a welcome sign of health and prosperity. Given the rarity of obesity in preindustrial societies, it is not surprising that ethnomedical terms for obesity are usually non-existent.

Perhaps it is large body size rather than obesity per se that is an admired symbol of health, prestige, prosperity or maternity. The agricultural Tiv of Nigeria, for example, distinguish between a very positive category “too big” (*kebe*) and an unpleasant condition “to grow fat” (*ahon*). The first is a compliment because it is a sign of prosperity; the second term is a rare and undesirable condition. For women, fatness may also be a symbol of maternity, nurturance, and adult success. Symbolically, a fat woman is well taken care of, and, in turn, takes good care of her children. The ethnographic record indicates that Fellahin Arabs in Egypt describe the proper woman as fat because she has more room to bear a child, lactates abundantly, and gives warmth to her children. In contrast, the cultural ideal of thinness in developed societies is found where motherhood is neither the sole nor primary means of status attainment for women. The ideas that fat babies are beautiful and that fat children are healthy children are very widespread throughout the world. Foods, particularly sweet foods, can be treated as symbols of love and nurturance on the part of parents and grandparents; the growing problem of child obesity in China is related to increased economic resources, the one-child policy, and doting grandparents. In some cultures it may be impolite for a guest to refuse some offered food, but it is taboo to refuse food from one’s mother.

Fatness and CrossCultural Standards of Beauty

Culturally defined standards of beauty for women vary between societies and may have been a factor in the sexual selection for phenotypes predisposed to obesity. A classic example is the custom of “fattening huts” for elite Efik pubescent girls in traditional Nigeria. Here fatness was a primary criterion of beauty as defined by the elites, who

alone had the economic resources to participate in this custom. An important recent ethnography of Azawagh Arabs of Niger entitled *Feeding Desire* (Popenoe, 2004) illustrates these cultural notions to an extreme degree. Here, fatness to the point of voluptuous immobility is encouraged by systematic over-eating in order to hasten puberty, enhance sexuality, and ripen girls for marriage. The people believe that women’s bodies should be fleshy and laced with stretch-marks in order to contrast with thin, male bodies. Similarly, fatter brides (as well as early maturing brides) demand significantly higher bridewealth payments among the Kipsigis of Kenya. The Tarahumara of northern Mexico consider fat legs a fundamental aspect of the ideal feminine body; a good-looking woman is called a “beautiful thigh.” Ramotswe, the large and beautiful protagonist of a popular mystery series by Smith (2009) set in Botswana, is referred to as “traditionally built.”

Among the Amhara of the Horn of Africa, thin female hips are called “dog hips” in a typical insult, and thin women in Jamaica are thought to be meager and powerless, like a mummy or a dried empty husk. Yet in Belize body shape is more important than body size, with most people preferring women to have a curved, hourglass figure like a Coca-Cola or Fanta soda bottle.

Among the world’s cultures, it is difficult to know how widespread is the association of plumpness and beauty.



Zeinabou, considered very beautiful in the Azawagh Arab culture. Tassara, Niger, 1991. Photo courtesy Rebecca Popenoe.

A preliminary indication can be found through a crosscultural survey based upon the Human Relation Area Files (a cross-indexed compilation of ethnographic information on over 300 of the most thoroughly studied societies). This data offers the basis for some preliminary generalizations, notably that cultural standards of beauty tend not to refer to physical extremes. On the other hand, the desirability of “plumpness” or being “filled out” is found in 81 percent of the societies. This standard, which probably includes the clinical categories of overweight and mild obesity, apparently refers to the desirability of fat deposits, particularly on the hips and legs.

Although crosscultural variation in standards of beauty is evident, this variation falls within a certain range. American ideals of thinness occur in a setting where it is easy to become fat, and preference for plumpness occurs in settings where it is easy to remain lean. In context, both standards require the investment of individual effort and economic resources; furthermore, each in its own context involves a display of wealth. Cultural beliefs about attractive body shape in mainstream American culture place pressure on females to lose weight; such cultural beliefs are central to the etiology of anorexia nervosa and bulimia.

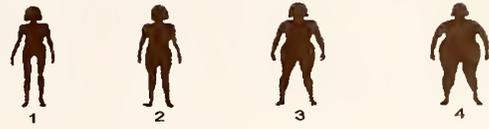
Ideal Male Body Type, Size, and Symbolic Power

The ethnographic record concerning body preferences in males is weak, yet preliminary research suggests a universal preference for a muscular physique and for tall or moderately tall stature. Men tend to aspire to a muscular shape characterized by well-developed upper body muscles and slim waist and hips. Efforts to achieve this ideal body generally center around exercise rather than diet.

Large body size may serve as an attribute of attractiveness in men because it symbolizes health, economic success, political power, and social status. “Big Men,” the political leaders in tribal New Guinea, are described by their constituents in terms of their size and physical well-being: he is a man “whose skin swells with ‘grease’ [or fat] underneath” (Strathern 1971). The spiritual power (*mana*) and noble breeding of a Polynesian chief are expected to be reflected in his large physical size. In American society there are historical vestiges of a similar idea, for example, a “fat cat” is a wealthy and powerful man who can “throw his weight around.”

Contemporary rap and hip-hop is filled with positive references to large bodies indicating largesse in life,

Female Silhouettes



Male Silhouettes

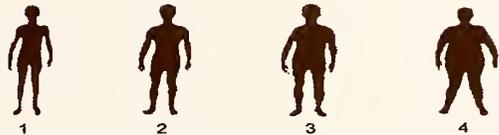


Figure 1 The silhouettes used in the perception of body size (1 = thin, 2 = normal, 3 = overweight, 4 = obese).

Illustration courtesy D. T. Simeon. Published in Simeon, D.T., et al. 2003.

especially in names such as the Notorious B.I.G., Heavy D, and the Fat Boys. Most male college students in the U.S., in contrast to women, want to gain weight because it is equivalent to gaining muscle mass and physical power in a process called “bulking up.”

Conclusions

Three conclusions can be drawn from this discussion of culture and its relationship to obesity.

- First, recognition of cultural variation in beliefs and behaviors related to obesity needs to be incorporated into health programs aimed at reducing the prevalence of obesity.
- Second, more education is needed about the importance of the location of body fat (rather than solely BMI) as well as the medical benefits of increased physical activity regardless of body size.
- Third, more research is necessary on the role of culture as it interacts with genes, on the etiology of obesity, and on associated chronic diseases.

Existing cultural beliefs must be taken into account in the design and implementation of health promotion projects. A classic example is an obesity prevention campaign in a Zulu community outside of Durban (Gampel 1962). It featured one health education poster that depicted an obese woman and an overloaded truck with a flat tire, with a caption “Both carry too much weight.” Another poster showed a slender woman easily sweeping under a table next to an obese woman who is using the table for support; it has the caption, “Who do you prefer to look

like?” The intended message of these posters was misinterpreted by the community because of a cultural connection between obesity and social status. The woman in the first poster was perceived to be rich and happy, since she was not only fat but had a truck overflowing with her possessions. The second poster was perceived as a scene of an affluent mistress directing her underfed servant.

Health interventions must be culturally acceptable, and in this regard we cannot assume that people place the highest priority on their health or on their physical appearance. Many people at risk of obesity live in poverty, or have a history of poverty, and therefore feel insecure regarding possible future food shortages. Similarly, eating high calorie comfort foods can be a psychological adaptation to stressful living conditions. Finally, disadvantaged people may discount their futures – that is, ignore somewhat vague risks of future chronic disease associated with obesity when they do not feel empowered and live in a fundamentally risky world. The social distribution of overweight and obesity may reflect social inequalities as well as a changing “obesogenic” environment.

The frequency of past food shortages, the social distribution of obesity, and the cultural meanings of fatness, when taken altogether, suggest a biocultural hypothesis of the evolution of obesity. Both genetic and cultural predispositions to obesity may be products of the same evolutionary pressures, involving two related processes. First, genetic traits that cause fatness were selected because they improved chances of survival in the face of food scarcities, particularly for pregnant and nursing women. Second, in the context of unequal access to food, fatness may have been socially selected because it is a cultural symbol of social prestige and an index of general health. Under Western conditions of abundance, our biological tendency to regulate body weight at levels above our ideal weight cannot be easily controlled even with a reversal of the widespread cultural ideal of plumpness.

Recent advances in understanding the genetic bases of obesity are echoed by new understandings about the role of “environment.” Recent research into the role of urban sprawl, the built environment, and resulting sedentary modern lives demonstrates that decreasing physical activity has contributed to current levels of overweight and obesity.

Despite increased understanding of the etiology of overweight and obesity, as well as the combined

biocultural contributions to the conditions, many questions and avenues for future anthropological research remain. These include: social discrimination against fat people, even when the majority of a population is fat; relative influences of dietary change and decreased physical activity in obesity; changing cultural standards of body ideals and physical activity related to acculturation and class mobility; the cultural perception of the medical community, particularly obesity researchers; cultural patterns of accommodations for an increasingly fat and less mobile population; and understanding of the cultural beliefs and behaviors of individuals or groups who are successful in reducing risks for chronic disease through sustained weight loss.

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