Obesity rising, but why?
Eduardo Kausel
Massachusetts Institute of Technology
February 15, 2008

With the myriad weekly headlines in tabloids announcing yet another miracle diet for excess weight or report on the battles of the glitterati with anorexia, bulimia and cellulites, it is evident that the obesity problem in America only continues to grow, and this is mirrored also in the frequency with which cover page articles on weight and diet appear in major magazines, including the prestigious National Geographic. That the modern sedentary lifestyle of children and the weakening of physical education classes in schools together with the pervasive role of the food industry are significant contributors to the obesity problem is plainly evident to me, but these are aspects of the problem that have been cogently reported and documented before. In contrast, it seems that nobody ever provides any profound insights into the deep causes that underlie this vexing problem, which is why I wish to offer some alternative reasons as to why people may eat too much. These causes are inextricably linked to subtle cultural phenomena that have taken root over the last few generations, and inasmuch as people are immersed in that culture and can’t see themselves from “out of the box”, they are unable —and perhaps even unwilling— to reverse the fatness trend. Yet unless one clearly understands all of the reasons that ultimately cause people to eat more today, one is unable to combat the problem.

Until the middle of the 20th century obesity was rare, even among people who could afford to buy as much food as they desired. ... People did not need to eat as much as they do now, they were satiated with less food, ate what they wanted, and did not need dieting.

Why hungrier today?
Sure, it is crystal clear that people gain weight because they eat too much and ingest more calories than their bodies need, but that is begging the obvious. What journalists, doctors and scientists haven’t discerned is why should people need to eat more today, considering that until the middle of the 20th century obesity was rare, even in people who could afford to buy as much food as they desired. Leaving aside some of the poor and malnourished classes of the inner cities, five decades ago most people did not need to eat as much as they do now, they were satiated with less food, ate what they wanted, and did not need dieting.

Biological theories
Evidence of recent studies from worms to monkeys indicates that animals which are consistently fed slightly below their normal daily calorie needs are healthier and live longer lives. Still, it is not yet clear if this applies to humans, especially because the stress of constant fasting may cause harmful effects of its own.

In the last decade or so researchers have began to understand how a number of hormones, such as insulin, leptin and ghrelin, mediate the regulation of appetite and fat storage, and their mode of function and activity in the body continues to be a matter of intense investigation and debate today. However, hormones per se have not been implicated as the primary cause of obesity for most persons even if excess adipose tissue has at times been found to elicit hormonal imbalances in some individuals that make losing weight difficult or virtually impossible.

Another fascinating news recently making the headlines is the discovery of a link between the type of bacterial flora in the gut and obesity. While researchers are just beginning to unravel the complex interactions and synergy between bacterial species in the intestine and their findings await further confirmation, the most likely outcome will be that obesity is found to cause changes in the flora and not the other way around, and that the influence of the type of flora on obesity, if any, is relatively small. Nonetheless, microbial ecology in the body appears to be a promising field of research.

1 “The heavy cost of fat”, National Geographic, August 2004
3 “Intestinal bacteria may explain obesity”, Associated Press, June 13, 2006
It is often argued that people inherit the tendency to excess weight from their parents and grand-parents. While there is no denying that some individuals may in fact be victims of their own genes, there is no convincing explanation as to why this tendency should be more manifest today than it was half a century ago, why it should cut across all cultural and racial groups, and how the American-born children of immigrants from places where obesity is rare (e.g. Japan) acquire fatness genes simply by virtue of living here.

Another closely related explanation goes roughly like this: Our forebears thousands of years ago had to endure periods of famine, during which evolutionary pressures favored those whose bodies could process and store fat more efficiently. Hence, our tendency to excess weight got indelibly written into our genes, which condemns us to be fat—diet or not.

Yet another explanation is the so-called set point theory. It basically propounds that our body knows exactly how heavy it wants to be and regulates our appetite to attain and sustain that goal. Eat more than the ideal body weight and the metabolism revs up and burns away the excess calories. Go on a diet, and the body promptly switches into conservation mode that allows it to get by with fewer calories. Succeed after a strict diet to lose weight, and steady hunger pains will ensure that you get back to your old set weight.

**Blame your mother**

While there may be elements of truth in the theories mentioned, they most certainly do not explain why the set point should be so much higher today than in the past. What raised it to current levels? Some recent observations in mice⁴ may indicate a possible biological reason: Overnourished fetuses often become fat adult mice, reportedly by activation during gestation of several hundreds of genes. This seems to suggest that the set point of babies may already be set in the womb, which condemns us to be fat —diet or not.

Yet another explanation is the so-called set point theory. It basically propounds that our body knows exactly how heavy it wants to be and regulates our appetite to attain and sustain that goal. Eat more than the ideal body weight and the metabolism revs up and burns away the excess calories. Go on a diet, and the body promptly switches into conservation mode that allows it to get by with fewer calories. Succeed after a strict diet to lose weight, and steady hunger pains will ensure that you get back to your old set weight.

**Food as entertainment**

Consider next the issue of food as social glue. While walking in a park I once saw a woman going on a stroll with her infant child. At one moment she stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content, and whatever the woman stopped, the baby was perfectly content.

**Contagious fatness?**

Some of the arguments for the inheritance of obesity have also come from observing families in which many or most members are fat. But this glosses over the fact that spouses are not blood relatives, yet chances of both being fat are much higher than average. The problem then is not one of genes, but food culture, and spouses indoctrinate each other—and their children—with their wrong food choices and bad eating habits. This is strongly corroborated by a recent study⁵ which found that the friends of overweight persons are significantly more likely to be fat. In the press, the absurd interpretation of this observation was that fatness was “contagious”—opinions that were promptly echoed by some experts. However, this simple-minded explanation completely overlooks the obvious fact that friends are friends because they share cultural background and affinities, social class, sense of humor, tastes, and with that also diet, preference for certain types of food, and bad eating habits. In fact, this correlation between fatness and friendship strongly corroborates that fatness is in fact mostly a social, and not a medical or genetic phenomenon.

---

⁴ Science News, V. 171-8, Feb 24, 2007

acquires the habit of eating at random times throughout
the day simply because, and not to satiate hunger.
Chances are then that the set point of this baby will be
adjusted upwards. And this continues in childhood:
During an outing to the zoo or park, one of the parents
of a family may offer a *Who cares for an ice cream?* to
which the children’s unanimous answer is a jubilant
me! That none of the children may have actually asked
for one is by then a moot point. Thus, parents and
society train their children to eat without any need, but
simply for joy and entertainment.

Some readers may disagree with my previous
examples and counter that an occasional cookie or ice
cream causes no harm to a child, with which I would
concur. But they would also have missed my point: The
treats are not so rare, and one cannot judge their
harmful effects individually, because they acquire
meaning only in the aggregate, i.e. it is the pattern
that counts. Unless one sees how the process of excess
eating gets started with innocent yet frequent little
steps, one cannot do anything to prevent the onset of
obesity. Once the infants and children have developed
fat cells in response to the superfluous food, these
remain with them for life, and when starved and
partially depleted of fat, they elicit hormonal signals
that are best summarized as loud cries of *Feed me!*
Resistance to those bodily demands is only an option
for the iron-willed.

*Cultural bias and overfed children*

Another problem is that of-fading memory and drifting
standards of normalcy. As social and family customs
evolve, people adapt and get used to the imperceptible
changes, and in due time they lose memory of sizes of
portions and proper diets, of the art of cooking, and of
how bodies looked in earlier times or should look now,
especially those of children. Moreover, society and the
arts tend to glorify cute babies and pink-cheeked
children who are “round” and exhibit “adequate”
amounts of adipose tissues, much like the rubicund,
rounded cherubs wafting on clouds in Baroque
paintings. But decades ago—or at present in some
other countries—children were not so round, had little
subcutaneous fat and exhibited bodies that today would
be derided as “bony” or “skinny”, or even the victims
of parental neglect. Still, a century ago most of them
grew into well-proportioned adults, and their set point
remained low. But modern cultural biases against
skinny babies and children are simply too large for
society to resist, and the tendency to overfeed them will
remain.

Grownups also often overlook the fact that children
weight less and thus need not eat as much as adults,
especially calorie-rich snacks and drinks. A nine to ten
year old will weigh perhaps half of its eventual adult

weight and thus need only some 60% in calorie intake.
Hence, *handing out a two-scoop ice cream to a child is
like offering an obscene four-scoop cone to an adult.*
Similarly, the calories in a single ½ liter sweetened
soda beverage represent an inadmissibly large fraction
of a child’s daily calorie requirements. A youngster
who drinks three such beverages a day in school and at
home will easily consume 50% of his daily calorie
needs just in soda, and gulp this down without feeling
satiated. Similarly, the portions for children at lunch
and dinner ought to be only a fraction of the portions
for adults—which nowadays are too large anyway,
because parents’ own portions are too large.

**Handing out a two-scoop ice cream to a child is like offering an obscene four-scoop cone to an adult.**

*Eating throughout the day*

Many (most?) persons have (acquired!) the habit of
eating at random times during the day, of eating small
portions and snacks at periodic intervals. Here, even
those who mostly adhere to the three-meal custom of
breakfast, lunch and dinner will also break for coffee
and doughnuts in the morning, and another “light”
snack in the afternoon, not to mention an occasional
chocolate bar or a few cookies or peanuts taken from
the desk while working at the computer. Here at MIT, a
daily ritual is that of coffee and calorie-rich chocolate-
chip or butter cookies being offered to the attendees of
seminars and meetings.

Some experts claim that it is healthier to eat many
times during the day than to eat only two or three times,
but there is not one shred of scientific evidence that it
should be so. In fact, zoos often take a day off in
feeding their large carnivores such as lions and tigers,
reportedly to maintain their health. Moreover, there are
many problems with eating throughout the day:

- One eats without really being hungry. This is done
mostly to socialize with other coffee breakers, or to
break the tension (or boredom) of work.
- It is difficult or even impossible to control the
amount and quality of calories ingested each day.
- The food eaten is almost invariably of the junk
percentage type, and snacks end up making a sizable portion
of the daily consumption of calories.
- The body gets used to eating constantly despite
little hunger, so when deprived —say when
skipping snacks in attempts to reduce weight—the

---

8 The basal metabolic rate (BMR) in mammals (the energy
needed to maintain physiological functions such as blood
flow, breathing or brain activity) grows roughly in proportion
to the body mass raised to the power 2/3. The daily calorie
requirement is roughly 50% higher, and depends, among other
variables, on the level of physical activity.
Physiological and psychical torture become unbearable.

Pavlovian reflexes
Yet another source of eating relates to the so-called conditioning reflexes. In the late 1890’s, the Russian researcher Pavlov found that mice began drooling and salivating in response to the look and smell of the food offered, a phenomenon that he referred to as psychic secretion. In today’s world, food is everywhere, in vending machines, ambulant vendors, fast food restaurants, and the abundant variety on display in supermarkets. Thus, people are constantly thinking of, smelling or seeing food throughout the day, or seeing colleagues eating at their desks, and these stimuli surely trigger their cravings for food. Who can resist and not feel hungry with such an assault onto the senses?

People are constantly thinking of, smelling or seeing food throughout the day, or seeing colleagues eating at their desks, and these stimuli surely trigger their cravings for food.

Nostra culpa
Other than the tentative biological explanation of higher set points in babies from mothers who have gained too much weight during pregnancy, among the main reasons for an increased waistline today are the following cultural manifestations:

- Sedentary life, and above all, low physical activity in children, who have replaced the tumble and roll in the yard with TV watching and computer games.
- Wrong food culture, wrong food choices, wrong amounts. Difficult to break the habit, once established.
- Ubiquitous displays of food in convenience stores, fast food restaurants, ambulant vendors and vending machines as well as food odors that permeate the environment. These trigger Pavlovian secretions in the body that cause cravings for food.
- Food as social lubricant, as entertainment, to release emotional stress, or to combat depression.
- Habit of eating throughout the day at random times and without being truly hungry.
- Snacking on high calorie (junk) foods that only satiate for brief periods.
- Quenching thirst with soft drinks and sugar-laden fruit juices instead of water. In fact, merely drinking (or eating) consistently some 135kcal more than needed each day may increase the body weight by about a pound each month.
- Brief quick lunches and dinners with little interaction among members of the nuclear family promote excess eating. Conversation allows time for the body to initiate digestion and send clear signals of satiety.

- Parents who work may not have the time (or desire, or knowledge) of how to cook healthy meals, so they replace these with TV dinners and prepared dishes and snacks that are higher in calories than freshly prepared foods.
- Lunch and dinner portions at home are much too large, because parents eat too much, and the tendency is to eat it all simply because it is in front. Children get then used to eating more than needed. It would be healthier if smaller portions were served, followed when needed by second helpings.
- Portions served at restaurants have grown, in some cases to gargantuan proportions. Since people tend to eat and drink the whole portion they have purchased, they get used to eating more.
- In response to commercial pressures, the food industry offers progressively larger sizes of snacks (e.g. sodas that have grown from 350ml to 500ml; when I was a child, the sinuous Coca Cola bottle contained less than 200ml).
- Children buy or choose a larger fraction and quantity of their calories by themselves. Decades ago, they were fed by their parents and schools.
- The rich American breakfast was appropriate for farmers who labored the fields from dawn to dusk. It is not appropriate for today’s sedentary workers.
- Shifting standards: Moderately overweight persons are now seen as normal and normal children with little subcutaneous fat are seen as “skinny”. This stereotype is difficult for parents to recognize, especially if they themselves are overweight, for they have “forgotten” what normal is. Thus, they will tend to overfeed their children, who in turn will perpetuate this culture in the next generation, after which the obesity problem will have become “locked in”.

Paraphrasing the maxim of real-estate agents, the three main causes of obesity are lifestyle, lifestyle and lifestyle. Or as the comic strip “Pogo” famously proclaimed, We have met the enemy, and it is us.