

Facebook, Obesity, and Your Friends' Friends

By Nicholas A. Christakis and James H. Fowler

Thanksgiving is a time of year when we gather with friends and family. But it is also a time when we eat. And eat. And eat! Two years ago, we published an article in the *New England Journal of Medicine* that showed such family gatherings can help to explain the obesity epidemic. The propensity to put on pounds is not isolated to a single individual—when we gain weight, so do our friends, siblings, spouses, and even our coworkers. And the effect doesn't stop there—it seems to spread to friend's spouses, siblings' coworkers, and even to friends' friends' friends. Our social networks contain “clusters” of people with the same weight that extend all the way out to three degrees of separation.

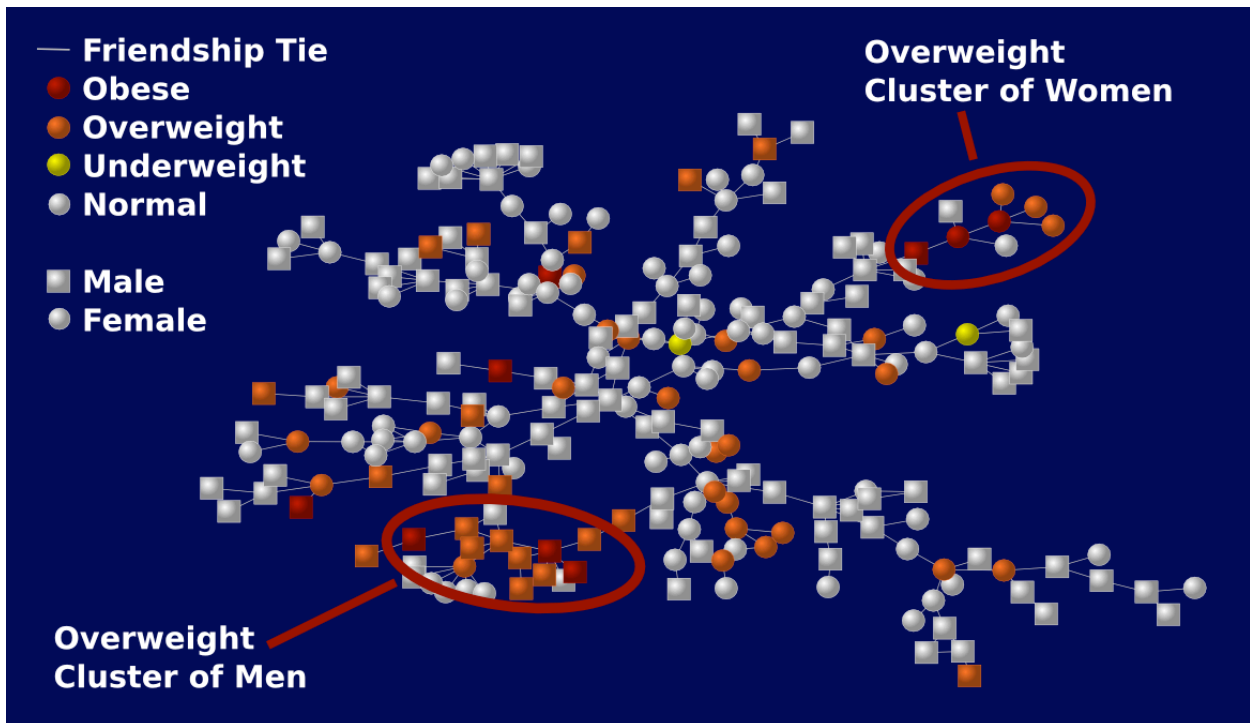
Several social processes might cause such clusters. One possibility is that there is a kind of social contagion, whereby behaviors or attitudes related to body size flow through the network. However, while a pair of friends might influence each other, they also might choose to be friends with each other because they were similar in the first place. Or they might both react the same way to something in their environment, like a new donut shop down the street, both gaining weight at the same time, but not because one is influencing the other. Teasing these effects apart requires the right kind of data, such as the ability to follow lots of people in a social network for a long time (we followed more than 5,000 people and mapped their social networks over 32 years). And when properly teased, the data show that obesity can spread in our real-world social networks from person to person to person.

Today, when we say “social network” most people think of Facebook, Twitter, or MySpace, and not necessarily the kinds of real-world network we have studied. Alas, our study only went up to 2003, before online social networks started to gain in popularity. So a natural question to ask is whether the same clusters of overweight individuals exist online. In our book, *Connected: The Surprising Power of Our Social Networks and How They Shape Our Lives* <hyperlink to <http://connectedthebook.com>>, we argue that connection and contagion are so fundamentally rooted in our evolutionary psychology that they carry over even to very modern aspects of human life – including email, blogs, and social networking sites. And new evidence is showing just how powerful the online world can be.

We decided to see whether overweight people cluster together in the online world like they do in the offline world, and, if so, under what circumstances. We started following a group of about 1,700 interconnected college students on Facebook about four years ago. In addition to all of their personal information and daily status updates and wall posts, we also had a very important resource: their photos. Although we could not put each of these students on a scale, we could study their photos and develop a systematic way to estimate each student's weight. It's true that people tend to post only flattering pictures of themselves, but, since everyone does this, we can still get an idea of who is relatively heavier than whom. And, it turns out that roughly a quarter of the people in our study were overweight or obese, which is close to the figure for college students nationwide.

At first, when we analyzed the whole Facebook network, we were surprised to find no evidence of clustering. There did not seem to be any relationship between your weight and the weight of your Facebook friends. But we soon realized that this makes sense. Our previous work showed that the social contagion of obesity only works between people who have close social relationships. Even though we may have 1,000 “friends” online, the very tenuousness of these relationships means they may not be as powerful as a single real-world connection. So, you probably won’t gain weight if any old Facebook friend does.

But what about your Facebook friends who are real friends – the old-fashioned kind? How could we figure out which Facebook connections were also important, real-world connections? One idea we had was to use the tagged photos that people share with one another online. If you upload a picture of someone, the chances are good that you have a real-world connection with them. At the very least, if you physically took the picture, then you and the tagged person were in the same place at the same time. In fact, while the average student in our data has over 110 Facebook friends, they have only six “picture friends,” a number very similar to the number of “close” friends people list when asked in sociology studies.



It turns out that when we restrict our analysis to “picture friends,” we do find evidence that overweight people cluster on Facebook! The results suggest that if one of your picture friends is obese, it increases the likelihood that you are obese by 11%. If your picture friend is overweight, the likelihood you’ll be overweight goes up by 10%. And, even more remarkably, if a picture friend of your picture friend is overweight, it increases the likelihood you’ll be overweight by 4%. In other words, we find evidence that clusters of overweight friends extend two degrees of separation on Facebook.

Many processes could underlie this clustering online, just as was the case in the offline world. Perhaps people are more likely to befriend others who resemble them in terms of body size. Perhaps groups of online friends share exposures to things that make all of them gain (or lose) weight in synchrony. Or perhaps when one of your close friends online gains weight, you follow suit. It is not yet clear which of these processes is occurring, but this is the first evidence we've seen that suggests the online world may be like the offline world when it comes to body size.

So as we gather round the Thanksgiving table with our friends and family this week, take a moment to consider how powerfully we influence and are influenced by the ties that bind. Facebook, MySpace, and Twitter give us new ways to keep in touch, but in many ways our online networks are really just an extension of the real-world networks that we have all inhabited for hundreds of thousands of years. If we truly want to understand this new virtual world we live in, we must first understand how and why we are connected.

(November, 2009)