

Forthcoming, *Psychology Today*, 2001.

Judith S. Kleinfeld

University of Alaska Fairbanks

April 12, 2001

E-mail: kleinfel@alaska.net

Telephone: 907-474-5266

Six Degrees of Separation: An Urban Myth?

By Judith Kleinfeld

In the first issue of *Psychology Today*, back in 1967, Stanley Milgram described the familiar "small world experience":

Fred Jones of Peoria, sitting in a sidewalk cafe in Tunis, and needing a light for his cigarette, asks the man at the next table for a match. They fall into conversation; the stranger is an Englishman who, it turns out, spent several months in Detroit. . . . "I know it's a foolish question," says Jones, "but did you ever by any chance run into a fellow named Ben Arkadian? He's an old friend of mine, manages a chain of supermarkets in Detroit. . . ."

"Arkadian, Arkadian," the Englishman mutters. "Why, upon my soul, I believe I do! Small chap, very energetic, raised merry hell with the factory over a shipment of defective bottle-caps."

"No kidding!" Jones exclaims in amazement.

"Good lord, it's a small world, isn't it?"

Milgram's small world experiment took this idea a step further: his subjects could reach anyone in the country, maybe anyone on the planet, through a chain averaging just a few people.

In the intervening decades, Milgram's findings have slipped away from their scientific moorings and sailed into the world of imagination. The "six degrees of separation" between any two people has been integrated into the intellectual world of educated people, and it has turned up in the media, movies and Web sites. A variant involving the actor Kevin Bacon has become a popular parlor game.

But Milgram's startling conclusion turns out to rest on scanty evidence. The idea of "six degrees of separation" may, in fact, be plain wrong—the academic equivalent of an urban myth.

The question of how people are hooked up had long been a game among mathematicians: If you choose any two people in the world at random, how many acquaintances would be needed to create a chain between them? Ithiel de Sola Pool at the Massachusetts Institute of Technology and Manfred Kochen of IBM collaborated on mathematical models, but never felt that they had broken the back of the problem.

But Milgram believed he had made substantial progress, if not solved the problem outright. Rather than theorize, Milgram experimented. He asked "starters" from places such as Nebraska to send a folder through the mail to a target person in cities like Boston. The starters had to send the folder to someone they knew on a first-name basis. That person was to send the folder to someone closer, and so forth.

Incredibly, Milgram reported that it took only five people in six jumps to reach a random stranger.

I had always regarded Milgram's work as one of the great, counterintuitive studies in the social sciences and wanted to replicate it in the electronic age. In order to do so, I tracked down the details of Milgram's papers in the Yale archives.

What I found was disconcerting: very few of his folders reached their targets. In his first, unpublished study, only 3 of 60 letters-5 percent-made it. Even in Milgram's published studies, less than 30 percent of the folders got through. Few replications spanning cities had been done, and these showed few folders made it through, especially across class and race boundaries.

Perhaps people didn't bother sending the letters on. That was Milgram's explanation. But that seems unlikely. The folder was not a simple chain letter, but an official-looking document with heavy blue binding and gold logo. If the subjects knew how to reach the targets, they would have passed the folder along.

There is some evidence that Milgram might be right in spite of his own research. Duncan Watts at Columbia University and his colleagues have created mathematical models that show how a small world could work. Their research has created interest in fields such as disease transmission and corporate communication.

It is just as likely, though, that Milgram was wrong. But if we don't live in a small world after all, why do people find this idea so easy to believe? My research suggests that first, the belief that we live in a small world gives people a sense of security, a feeling that we are all somehow holding hands. And small world experiences that we encounter naturally buttress people's religious faith as evidence of "design."

But also, there is a difference between what ordinary people mean by a "small world experience" and what mathematicians mean. When we say, "It's a small world," we are not talking about the chances of connection between two people taken at random. We are talking about the chances of meeting a person who knows someone from our past. Over a lifetime, these chances are high, especially for educated people who travel in similar networks.

And when an especially unlikely connection occurs, the world does feel small, whether or not the scientific evidence agrees.