

Social networks today. A decidedly small world

by Michel Forsé

Everyone has undoubtedly had personal experience at least once in their lives of what is suggested by the notion of a “small world”. You meet a complete stranger and you realize that you share a mutual acquaintance. Back in the 1960s, Stanley Milgram provided empirical validation of this intuitive notion by trying to determine how many intermediaries it took on average to link two individuals who did not know each other in a large country like the United States. He conducted a clever experiment that yielded a striking result: 5.2 intermediaries sufficed (or 6 “degrees of separation”, as the saying goes). Other studies since then have produced figures of about the same order. Without going into the technical details, however, these studies had certain problems, including that many of the subjects surveyed dropped out during the studies, and the number of participants were relatively small.

The recent advent of social networks on the Internet has provided an opportunity to consider this issue again, this time on a much larger scale since the Net covers the entire planet. The networks formed by instant messaging, Twitter and Facebook have been studied from this angle. The question posed was always the same: how many intermediaries does it take to link two individuals selected at random from one of the networks. And while the figures may vary slightly, every time the response confirmed or amplified what could be expected based on Milgram’s work.

The case of Facebook is particularly instructive, since it is the largest network analyzed to date. An investigation conducted in 2011 covered 721 million people and some 69 billion links that exist among them. On this basis, it took

an average of 4.7 intermediaries to connect two Facebook subscribers worldwide. This figure drops even further, to 4.3, if we restrict ourselves to the United States. There is no doubt therefore that this largely confirmed the theory of a “small world”.

But this still needs to be explained. While many models exist, two seem paramount: one based on a world of clusters connected by weak links, and another that invokes hubs at various levels (international, national, regional, local) demonstrating relative scale invariance. Up to now, these models have been seen as rivals, but there may be potential for combining them, as is suggested in an article published on this subject in the [Revue de l'OFCE](#).