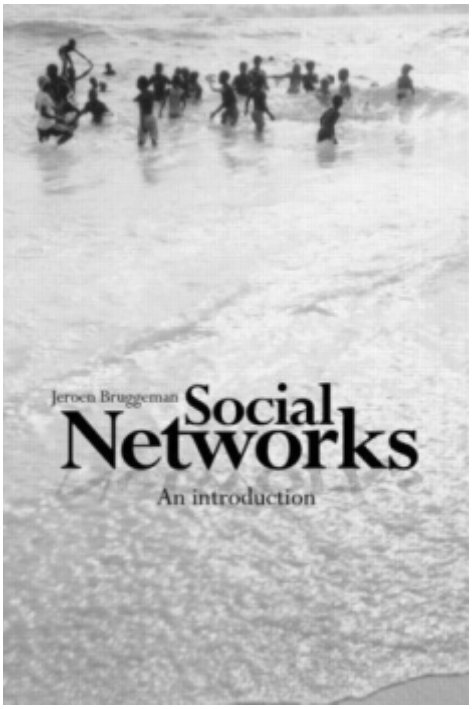

Routledge, 2008

Humans are the most social of all animals, learning from and being interdependent with many others, thereby forming relationships that span our complex world-society. Understanding humans and humanity therefore requires comprehending social relations, which may be hard to grasp systematically. Fortunately, the variety and turmoil of social relations can be mapped out as clear-cut networks. With the aid of network theory, characteristics of social life can be pointed out and explained that nobody imagined before, such as small worlds, highly skewed distributions of sexual and other social contacts, and the structure of social inequality and cohesion. Furthermore, phenomena that are not yet well understood can be grasped more clearly, such as organizations and the growth and diffusion of knowledge. Many social network models are also applicable to, or inspired by, other fields, such as economics, biology, political science, statistical physics, and organization science.

This book introduces social networks to a general audience, from novices in all kinds of fields to experts wanting to catch up, and from academics on the one hand to practitioners in consultancy, management, policy, and social work on the other hand. Sophisticated models are lucidly explained and comprehensible without math (which is put in boxes, footnotes, or references), and are illustrated with network diagrams and examples ranging from anthropology to organizational sociology. A free and easy to use software tool - R's igraph package - is explained in the final chapter so readers themselves can depict and analyze networks of interest to them. It includes a Graphical User Interface (see brief manual) that can perform a limited subset of igraph's options in a simple and user friendly way.

Table of contents

News, updates, and additional materials

Some **new developments** after the manuscript was completed (early 2008)

1. Obviously, there is tons of new literature out there, of which I will mention some in my lectures and will review more extensively if I get a chance at a 2nd ed. Inevitably, I missed a some relevant pre 2008 works, which I will then add as well. I'm particularly interested to learn about work done in Asia, South America, and other parts of the world that I haven't covered well enough, by not knowing enough languages.
2. Community detection is now also possible for networks with both positive and negative ties. The software will be out soon.
3. For users of *exponential random graph* models, there is a tutorial for R's statnet package.

Errata A network *component* is a set of nodes where each node can be reached from any other through a *path* (a concatenation of lines), as said in the book. However, a component is also maximal in the sense that every node that can be reached belongs to the component in question. (Organizations are components for the authority relation at a moment in time, since at other times people can work in other organizations, obviously.)

Software In the current version of R, in each working session one must set the working directory in the console menu: File > Change dir...

To generate a *power law* network of, say, 20,000 vertices, and to check out its degree distribution (exercises 3.1 and 4.1), use the following commands that work better than Chaper 8's suggestions, i.e. generate a directed network only, and use its indegree.

```
b <- barabasi.game(20000, m=10, directed=TRUE)

plot(degree.distribution(b, mode="in"), log="xy")

power.law.fit(degree(b, mode="in"), xmin=10)
```

A **Course syllabus** for 2009.

Finally, the printer of the book ruined my **pictures** by turning them into a grayish fog, while they are much more subtle and expressive instead, for example:

Street in Cotonou, Benin (2002)