

In large-scale networks such as the Web, most units are not neighbours. Nevertheless, they still can reach almost every other connected unit in a few steps, in this way creating a *small world*. This has been demonstrated by among others Stanley Milgram (1967) with his famous observation of the *six degrees of separation*. This means that, on average, every world inhabitant is connected to every other in only six steps when all available social networks of these inhabitants are used. The secret that explains this phenomenon is that actors are grouped in clusters with *strong ties*, and that they reach people far away in another cluster by long-distance ties, often *weak ties*. See pages 2–15 and Figure 2.2. Examples of clusters with strong ties are extended families, neighbourhoods, groups of colleagues and school classes.

When not only social networks are used, but also new media networks, the number of six steps could be reduced to five or even four as has been demonstrated in research using email, web-page links, SNS and Twitter messages for a test (Albert et al., 1999; Cheng, 2010; Watts, 2003).

An important question is how far actions and communication carry on this average of six degrees of separation. According to Christakis and Fowler (2009) the answer is three. According to the *three degrees of influence* rule, they show that the phenomenon of contagion on average reaches three steps further than the source and then gradually dissipates. Think about friends of friends. This goes for attitudes, feelings and behaviour and for a very broad range of phenomena such as political views, obesity, emotions or non-verbal behaviour – laughing, coughing and dancing are contagious – and even happiness.

The law of small worlds explains why our world is ever more connected and interactive using the Web and other communication networks.

BOX 2.8

The law of the limits to attention

As everybody in a network is able, in principle, to connect and communicate to everyone else in the network, there is a limit to attention because the time to read, listen or view for receivers runs out. The more people write/produce content on the Web, the smaller on average their audiences become.

Many people think that everything is available on the Internet as the number of senders and receivers is endless. They suppose that there is an audience for every new voice. However, this is a basic mistake. People forget that sending may be boundless, but attention is limited. It is easy to speak on the Internet, but difficult to be heard (Hindman, 2008). Let us suppose that every new Internet user has the same period of time to read and to write online. In that case, the new Internet user would on average find only an audience of one. Fortunately, most Internet users take more time to

read, listen and view than to write and to produce. Moreover, it takes more time to produce than to consume messages on the Internet. So, fortunately, the audience for a new voice is larger than one. However, it still is limited. The more people generate content on the Internet, the smaller their audiences become. Most weblogs are read by very few people; the majority of Twitter messages are never read; and most personal web-pages have a very small audience.

The limitation of Web audiences is strongly reinforced by ‘Googlearchy’, the rule of the most heavily linked (Hindman, 2008). Google and other search engines rank the most popular websites at the top of their results page. In this way they become even more popular (this is an instance of the power law discussed below). Because of the law of network extension we simply have to use search engines and other intermediaries.

So, in theory, the Web may offer equal chances to numerous senders, but in practice audiences are unequally divided. Hindman (2008) has even shown that media concentration on the Internet is bigger than in the traditional mass media (see Chapter 8). The largest part of the Internet audience goes to a few big players such as Google, MSN, Yahoo, Facebook and MySpace. At the other end of the scale, another large part goes to the numerous senders with very small audiences. This is the so-called ‘long tail’ (Anderson, 2006). But the middle is missing: surprisingly few middle-sized media in terms of audience can be observed on the Internet (Hindman, 2008: 82–102).

BOX 2.9

The power law in networks

In large, scale-free networks those units already having many links acquire even more, while most units keep only a few links. The mechanisms are a continuous growth of links, preferential attachment and contagion.

This distribution of a small number of units or nodes with many links, a large number of units or nodes with a few links and the missing middle is explained by the so-called power law. This is a statistical regularity for large-scale, so-called scale-free networks – scale-free means that there is no assumption on the number of nodes and links in the network. Nor is it assumed that every node is linked to every other or that the distribution is normal. The Internet, for example, does not have a fixed number of nodes, every user is not linked to everybody else and the distribution is not normal (this would mean a fat middle: a Bell curve). Instead, there is a power law distribution. This is marked by many nodes with a few links and a few nodes with a very large number of links: ‘They have the power’. In more common-sense language it is called ‘the rich are getting richer and the poor are getting poorer effect’ on the

Internet. Yes, the poor are also getting poorer, mostly not in absolute but in relative measures. The law of the limits to attention is responsible. Those with few links have increasing problems finding an audience.

There are three mechanisms explaining the appearance of this regularity. First, there should be a large and growing number of units and links that forces people to choose according to the law of network extension. Second, the new units decide to choose links to other units in the network following preferential attachment. In social networks this means that people tend to flock round the 'most popular guy'. In media networks such as the Web, the most conspicuous example is that search engine users tend to go to the first hits on the list. In this way the most popular links become even more popular. This also goes for Facebook and Twitter. Those that already have most friends and followers regularly assemble most new connections. The third mechanism is contagion. Observing and simulating the behaviour of others stimulates people to follow each other and flock to the most popular.

The power law helps to explain inequality in networks. In this book it will be shown that networks tend to increase inequality, despite the fact that they are also able to spread knowledge, information, contacts and other valuable things.

BOX 2.10

The law of trend amplification

Networks are relational structures that tend to amplify existing social and structural trends. When technologies such as ICT networks and computers are used, they serve as reinforcing tools.

The last 'law' of the Web returns in about every chapter of this book. It is the main contribution of this book to the known laws of the Web in network theory. A basic statement of this book is that networks such as the Internet tend to reinforce existing structures of society instead of overthrowing them. The effects of the Internet and the new media on society are evolutionary rather than revolutionary. The technology of networks might be revolutionary, but its social effects on society are not (van Dijk, 2010a). A very popular view is that things have never changed so fast and as deeply as they have in contemporary society, by the current communications revolution among others. However, already at the start of the following chapter we will see that changes in the former communications revolution of modern history, about a century ago, were perhaps even more pervasive for society and everyday life in those days than they are today. Remember that a communications revolution is not equal to a societal revolution! This also goes for the network society that gradually evolved from the mass society and did not, for example, put an end to capitalism.

In this book many examples will be given to show that the Internet and the new media reinforce existing social trends – they are trend amplifiers. The background