

Small worlds & the strength of weak ties

We find it eerie when we bump into a school friend from decades ago unexpectedly, perhaps in some foreign city miles from where we both live. We're surprised at the *small world* we've just encountered. Amazement at such a meeting, though, is misplaced.

Not just social networks, many others are 'small worlds' too. Markets, epidemics, traffic flows, supply chain interactions, the internet router system, food webs in ecologies, Fortune 1000 directors, ownership of German banks, the Kevin Bacon game, the metabolic rate of *e-coli*, the neurons in our brains . . . are all examples of small world networks.

There are similar processes and dynamic patterns in all small world networks. The number of links between nodes is surprisingly low and "weak ties", the often unnoticed connections between far away nodes, drive network dynamics in unexpected ways — including our social networks.



A Taipei market, reproduced with kind permission of Ronny Leva

Duncan Watts in his book [Six degrees: The science of a connected age](#) asks his readers to imagine kinds of worlds, CAVEMAN and SOLARIA. In the CAVEMAN society, everyone knows everyone else, and there are no visitors. It's a densely-clustered, closed network. By contrast, in the SOLARIA society, people live alone, rarely meeting across a sparse landscape. Any random connection between two individuals is as likely as any other.

Most people's social relationships comprise elements of both CAVEMAN and SOLARIA and everything in between. Typically, we belong to several dense CAVEMAN-like clusters of *strong ties*, perhaps family, work colleagues, sports or other group.

Indeed, we tend to have very close relationships with fewer than a dozen people, and have other strong ties with about 120-150, a predisposition anthropologist and evolutionary psychologist Robin Dunbar argues is a neuropsychological legacy from our hunter-gatherer past.¹

We have many more *weak ties* than strong ties, typically 2000 or so by the time we're in our 30s or 40s, perhaps more with address books and other memory aids.

These ties are the relationships you have with acquaintances, friends of friends and SOLARIA-type random meetings.

The sociologist Mark Granovetter published a now-famous paper [The strength of weak ties: A network theory revisited](#) forty years ago. For the first time, the role of weak ties was demonstrated to be important at a macro-level, at a society level. The reason why is that a single weak tie can provide a link between two densely-knit social clusters. If only one person from a cluster knows someone from a quite separate cluster, then *everyone* is in a small world network.²

Hence, a micro-group feature, weak ties, has an impact at a macro-societal level and thereby generates social cohesion.



A Salento boatman, also reproduced with kind permission of [Ronny Leva](#), a man with many weak ties

¹ For further exploration of this intriguing topic, see Professor Dunbar's book: [How many friends does one person need? Dunbar's number and other evolutionary quirks](#) and/or this Wikipedia entry on [Dunbar's number](#).

² For a fuller account (4 pages!) of these ideas, see a paper I wrote for the Warwick Manufacturing Group: [Sources April 2005](#).