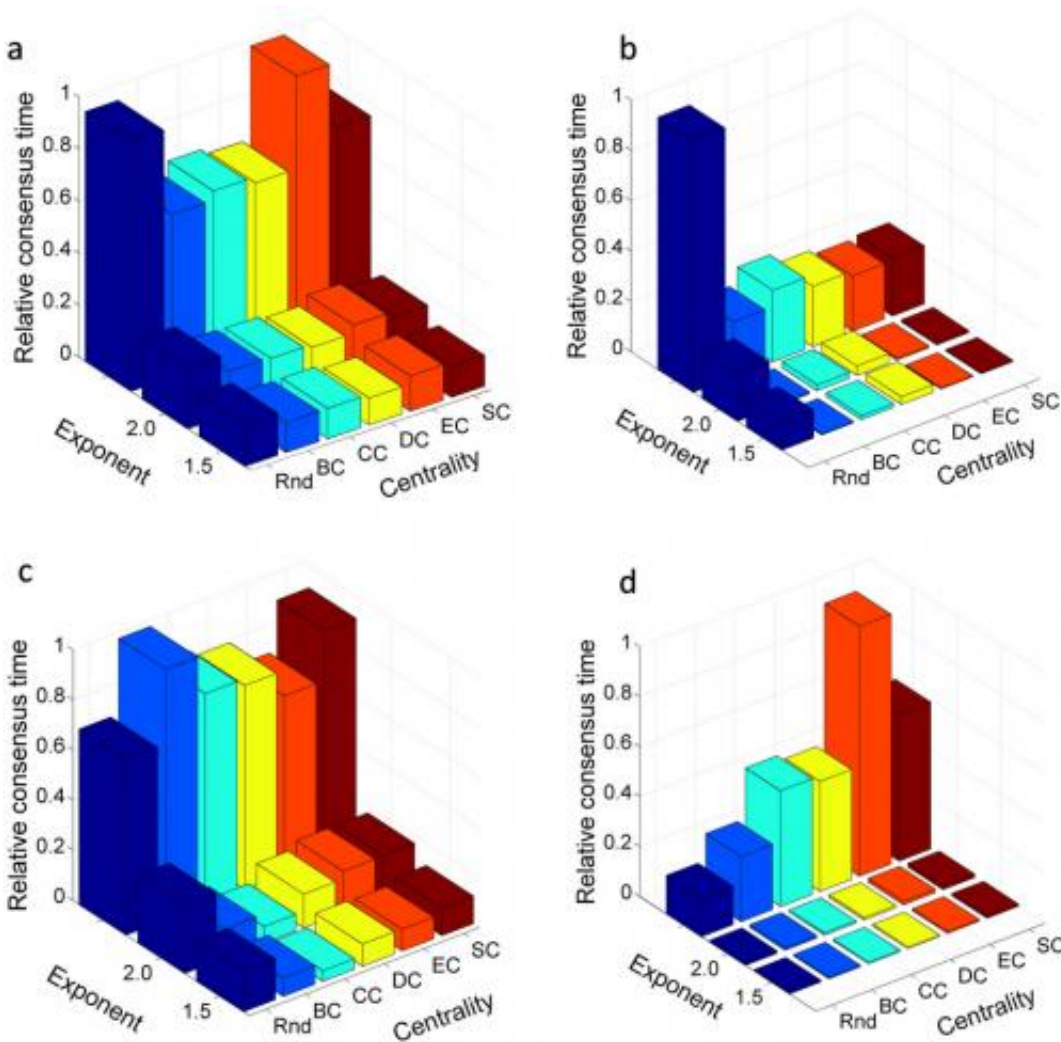


Peer pressure's influence calculated by mathematician

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Random and centrality-based emergence of leaders. Credit: *Scientific Reports* 3, Article number: 2905 doi:10.1038/srep02905

(Phys.org) —A mathematician has calculated how peer pressure influences society.

Professor Ernesto Estrada, of the University of Strathclyde's Department of Mathematics and Statistics, examined the effect of direct and indirect social influences – otherwise known as [peer pressure](#) – on how decisions are reached on important issues. Using mathematical models, he analysed data taken from 15 networks – including US school superintendents and Brazilian farmers – to outline peer pressure's crucial role in [society](#).

Professor Estrada said: "Our modern society is a highly-interconnected one – and social groups have become ever-more interconnected as time has progressed, with the evolution from the cavemen to today's technology-driven society.

"Reaching consensus about vital topics – such as global warming, the cost of health care and insurance systems, and healthy habits – is crucial for the evolution of our society.

"That is why the study of consensus has attracted the attention of scholars in a variety of disciplines, ranging from social to natural sciences, who have documented examples of peer pressure's influence on popular cultural styles – such as changing fashions over time and the behavior of crowds at football matches – as well as collective decision-making, and even pedestrians' walking behavior."

Professor Estrada's research into how decisions are reached found that the process begins when [individuals](#) directly connected to each other first reach agreement, then – under the influence of peers not directly connected to them – the entire social group eventually tips into a collective consensus. He said: "Consider a teenager who is pressed by her friends into binge-drinking on a Saturday night – this corresponds to

the direct pressure exerted by the peers connected to that individual.

"However, she is also under indirect pressure, by seeing that many teenagers are doing the same every Saturday. Thus, this indirect pressure could make the difference in that individual to copy a given attitude."

Professor Estrada's study, being published today in the Nature journal *Scientific Reports*, also examined the extent to which a small number of [leaders](#) can guide and dictate the behavior – and decisions – of an entire social group.

He said: "Think about the existence of groups in different organisations, such as industries. Every organisation has one or more leaders who might, for example, be trying to convince the group to go to – or indeed not attend – a demonstration about a contentious issue.

"The group can reach a [consensus](#) about the topic only by considering the direct pressure exerted by the members of the group and that of the leaders. However, if the individuals in the group observe that many other workers from external places have joined the demonstration, they can take a decision to join – regardless of the pressure exerted by their leaders."

In [social groups](#) in which indirect peer pressure is largely absent, the extent to which its leaders share the same views plays a critical role in the length of time it takes to reach agreement on issues. However, when there is strong indirect peer pressure, the role of the local leaders vanishes and individuals with no important positions in their networks can become the leaders of the [group](#).

Professor Estrada said: "Think about, for instance, the change of attitudes in respect to the smoking habit. In the 70s, it was very cool to smoke and you would see actors lighting cigarettes all the time on TV –

and movie stars were always smoking at decisive moments in films.

"Back then, individuals were not only directly pressed by their colleagues and friends to smoke but they also saw that people of the same social class, age and gender were doing the same. In this way, the combination of both direct and indirect peer pressure influenced the individuals to take up smoking.

"What is happening right now is the reverse. Many people have stopped smoking and they apply some direct pressure to their relatives and friends to quit too.

"However, in addition – and probably more importantly – individuals feel a lot of indirect pressure from the wider society to avoid smoking in public places. Smoking is not cool anymore – the combined action of direct and indirect peer pressure is winning the battle against tobacco use."

More information: How Peer Pressure Shapes Consensus, Leadership, and Innovations in Social Groups,
[www.nature.com/srep/2013/13100 ... /full/srep02905.html](http://www.nature.com/srep/2013/13100.../full/srep02905.html)

Provided by University of Strathclyde, Glasgow

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