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## Play nice

### ARVID ÅGREN reviews Nowak's Super Cooperators

Arvid Ågren

Why bother being concerned for others? The theory of inclusive fitness has been favoured by evolutionary biologists for almost 50 years. The theory resolves why people behave selflessly by considering the genetic relationship between the helper and the helped individual. Altruism, the unselfish concern for the welfare of others, evolves if the cost to the helper is less than the benefit to the recipient and is weighted by the genetic relatedness between the helper and the recipient. The more genes shared, the more help provided, which leads to an increase in the probability of the helper's genes getting passed onto the next generation. A neat summary of the theory is given by British evolutionary biologist J.B.S. Haldane, who said "I'd lay down my life for two brothers or eight cousins."

Last August, mathematical biologist Martin Nowak and two Harvard colleagues argued in a controversial article in *Nature* that predictions from inclusive fitness have highly limited applicability and only work under very strict conditions.

This sent inclusive fitness right back into the centre of debate in the evolutionary biology community. *Nature* later published five fiercely critical responses to the paper, including one signed by 137 (!) researchers.

Critics focused on the particular claim that inclusive fitness theory has contributed nothing to our understanding of social evolution.

"This claim is just patently wrong", commented Andy Gardner of Oxford University in an interview in the *New York Times*. Jerry Coyne from University of Chicago went further in his blog, *Why Evolution is True*, where he commented that Nowak and his colleagues demonstrated a "wilful ignorance of the literature." Gardner, Coyne and others point to fruitful empirical studies such as parent-offspring conflict.

In Nowak's book, *Super Cooperators: Altruism, Evolution and Why We Need Each Other to Succeed* written together with *New Scientist* editor Roger Highfield, he explains his reasoning to the general public. The book is an exciting account of how mathematics has enhanced the study of all sorts of biological questions, including the spread of cancer, the evolution of language, and the occurrence of altruism in the living world.

Nowak outlines five rules for the evolution of cooperation: direct reciprocity (being

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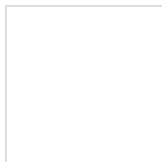
nice to individuals that are nice to you), indirect reciprocity (having a reputation of being nice makes others more likely to be nice to you), spatial games (be nice to your neighbour), group selection (cooperating groups do better than non-cooperating groups) and kin selection (Nowak agrees that giving preferential treatment to relatives can work under some circumstances). The statistician George Pox once commented that "all models are wrong but some are useful" and that holds equally true today. The relative importance of the five rules will be the subject of much future debate. However, one problem Nowak overlooks is the fact that inclusive fitness theory is not just a tool used to calculate when social traits are likely to evolve, but also tells us something very fundamental to the question of what natural selection maximizes: inclusive, rather than individual or group, fitness. Before Nowak addresses this shortcoming, he will struggle to convince the scientific community of the value of his models, however elegant they may be.

Overall, SuperCooperators is the kind of book more scientists should write. It provides a personal account of one of the most controversial topics of biology and manages to do so in a very accessible way. Add in some personal anecdotes about playing soccer with members of the House of Lords, cracking mathematical problems when hiking the Alps, and sipping cocktails with a Wall Street tycoon — and you got all the ingredients of a bestseller.

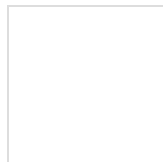
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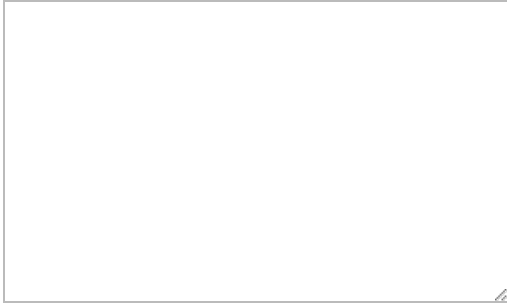
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