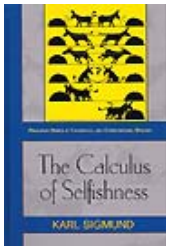
MAA Reviews

The Calculus of Selfishness

Karl Sigmund



Publisher: Princeton University Press (2010)
Details: 173 pages, Hardcover
Series: Princeton Series in Theoretical and Computational Biology
Price: $35.00
ISBN: 9780691142753

Category: Monograph
Topics: Game Theory, Mathematical Biology, Mathematics in Society

MAA Review

[Reviewed by Sarah Boslaugh, on 08/17/2010]

Nearly everyone has heard about game theory by now: a google search turns up over 2.5 million results and references to game theory turn up everywhere from big-budget movies like the John Nash biopic *A Beautiful Mind* to *South Park* and *The Simpsons*. On a more serious note, explicit or implicit references to game theory, or to what a given individual thinks is meant by some facet of game theory, often turn up in discussions of social and public policy issues. Such issues are too important to leave to the specialists, so the best defense is to get educated, at least on the basic level, about game theory, its assumptions and limitations.

Enter *The Calculus of Selfishness* by Karl Sigmund, a text intended (according to the author's preface) primarily for undergraduates in economics, psychology and evolutionary biology. Sigmund's writing is admirably clear and historically grounded and he wisely restricts his coverage primarily to a subset of situations: those involving reciprocal interactions among self-interested individuals in mixed populations. Each chapter has a brief bibliography and there is a longer bibliography and index at the back of the book.

Sigmund's treatment is no more mathematical than it need be (although it does require attention and a capacity for logical thought); the first chapter uses no mathematical notation at all. It provides an excellent introduction to some of the more common social dilemmas (including the Prisoner's Dilemma and the Snowdrift Game) and extends them to more complex situations including multiple interactions, artificial societies, and the introduction of punishment. This chapter makes fascinating reading for the interested general reader and provides a good background in game theory which should inoculate readers from being fooled by sloppy or completely incorrect references in the popular media.

The mathematical sledding gets heavier in chapters 2–7, but anyone who has survived general calculus should have no problem with these chapters. I realize that does not necessarily include all psychology majors (I can't speak for economics or evolutionary biology majors), so anyone considering using this book for that audience might want to take a close look at one of these chapters to see if they are suitable for the students in question. Topics covered include evolutionary game theory, repeated interactions, indirect reciprocity, the Ultimatum and Trust games, and interaction among larger groups. Chapter 7 introduces some complexities when structured populations such as families are considered.

Postscript: if you're interested in expressions of game theory in popular culture (referring to a few of these could liven up classroom discussions) check out Mike Schor's web page: http://www.gametheory.net/popular/.

Karl Sigmund is Professor in the Faculty of Mathematics at the University of Vienna. He is a regular contributor to *Nature*

and *Science* and author or co-author of 7 books including *Games of Life* (Penguin, 1994) and *Evolutionary Games and Population Dynamics* (Cambridge University Press, 1998).

Sarah Boslaugh is a freelance writer, statistical consultant and Instructor in the Washington University School of Medicine in St. Louis, MO. Her books include *An Intermediate Guide to SPSS Programming: Using Syntax for Data Management* (Sage, 2004), *Secondary Data Sources for Public Health: A Practical Guide* (Cambridge, 2007), and *Statistics in a Nutshell* (O'Reilly, 2008), and she served as Editor-in-Chief for *The Encyclopedia of Epidemiology* (Sage, 2008).

Reader Reviews

This project is funded in part by the National Science Foundation Grant DUE-0435198.