

THE LIMITS OF RATIONALITY¹

ALEX KACELNIK

During the academic years 2001/02 and 2002/03, the Wissenschaftskolleg hosted a focus group entitled “The Sciences of Risk”. The project involved Fellows, guests of the Rector, guests of the Fellows and special invitees to two workshops. The project as a whole was aimed at casting a multidisciplinary glance on the interaction between normative and mechanistic approaches to research on decision-making in both human and non-human organisms (animals and plants). The first workshop was held in May 2002 (see *Wissenschaftskolleg Nachrichten* 11, 2002 and *Wissenschaftskolleg Jahrbuch* 2001/02), and dealt with decisions under uncertainty. The second, held in May 2003 under the title “The Limits of Rationality”, dealt with both deterministic and non-deterministic problems, but focused more strictly on non-human organisms.

The workshop was suggested by the realisation that while many theoretical advances result from the fusion of economic ideas of optimality with principles of biological evolution, empirical studies in humans and animals often report systematic violations of fundamental properties of economically rational behaviour. Some of these violations have been found in animals’ responses to risk, thus hitting at the core of the focus group’s interests. These reports include violations of transitivity and regularity, both considered hallmark properties of rational behaviour. Researchers claim that hummingbirds, jays and bees modify their attitude towards risk depending on the context of their choice, in some cases reversing their preference, depending on the presence or absence of less preferred (and then theoretically irrelevant) options. These observations contradict axiomatic principles of rational choice. In other puzzling observations, starlings and pigeons have been seen to prefer one kind of reward to another simply because they were harder to obtain, an animal behaviour analogue of the so-called “Sunk-Cost” and “Concorde” fallacies in human

¹ Workshop held at the Wissenschaftskolleg zu Berlin, May 8–10, 2003, supported by the Otto and Martha Fischbeck Foundation.

behaviour and evolutionary theory. At the same time, other workers have questioned the interpretation and generality of these observations, pointing to experiments in which decision-makers (including starlings) follow the principles of rational choice rather fastidiously. The significance of these controversies is clear and underlies the group's decision to summon the main actors to discuss them face to face in a workshop: "mistakes" (that is, suboptimal behaviour due to random factors) are not a worrying concern, but systematic misbehaviour is a different matter. If systematic maladaptive behavioural trends are widespread, theoretical biologists face the challenge of developing suitable accounts of how these trends might have evolved and why they are evolutionarily stable, that is, why are they not weeded out by natural selection. Cataloguing examples of maladaptive behaviour is not a research programme with which modern biology can cohabitate happily. A proliferation of publications in the main biological journals, where strongly held contradictory views were expressed, made this workshop timely and promising.

The workshop brought some of the main originators of this literature together with experts on experimental economics and human behavioural research. Intense and productive discussions were held for two days in a convivial but sometimes lively and robust exchange of perspectives.

Some authors (Hurly, Bateson, Shafir, Waite) described elegant new experiments demonstrating how conventional principles of rational choice are violated by birds and insects under appropriate circumstances; others (Schuck, Pompilio, Simpson, Raubenheimer, Kacelnik) argued that most of these violations can be explained by changes in the state of the subjects and were not, after all, violations of biologically optimal strategies. From researchers on human decision-making (Todd, Hutchinson) came the strong view that the origin of many of these violations can be found in the paradoxical consequences of the use of simple heuristic rules for choice, which can lead to preferring less rather than more information and less rather more choice in exchange for faster mechanisms that are easier to implement. The economists at the meeting (Eckel, Sugden), meanwhile, brought the refreshing notions that what may be misleading is the assumption that the paramount principles of economic rationality actually do reflect optimal and realisable strategies or that metrics of preference in the most influential experimental paradigms actually do express general properties of the subjects. (Eckel's analysis of lack of correlation between the most widespread metrics of risk appetite in human experiments caused deep concern to the experimentalists among the audience.)

The deliberations at Wiko were complemented by enjoyable and productive discussions during walks in the Grunewald, appropriately lubricated by excellent beer. All participants learned a great deal from each other and several collaborations were planned as a consequence of the workshop.

Speakers

Melissa Bateson, University of Newcastle

Cathy Eckel, Virginia Polytechnic Institute and State University

Gesine Hofinger, Wissenschaftskolleg zu Berlin and Universität Bamberg

Andy Hurly, University of Lethbridge, Alberta

John Hutchinson, Max-Planck-Institut für Bildungsforschung, Berlin

Alex Kacelnik, Wissenschaftskolleg zu Berlin and University of Oxford

Lorena Pompilio, University of Oxford

David Raubenheimer, Wissenschaftskolleg zu Berlin and University of Oxford

Miguel Rodríguez-Gironés, Wissenschaftskolleg zu Berlin and Estación Experimental de Zonas Áridas, Almería

Cynthia Schuck, University of Oxford

Sharoni Shafir, Hebrew University of Jerusalem

Stephen Simpson, Wissenschaftskolleg zu Berlin and University of Oxford

Robert Sugden, University of East Anglia, Norwich

Peter M. Todd, Max-Planck-Institut für Bildungsforschung, Berlin

Thomas Waite, Ohio State University

Participants



C. Schmitz, S. Simpson, B. Cusack

R. Gadagkar, G. Hofinger, C. Eckel, T. Waite

M. Bateson, P. M. Todd, A. Hurly, D. Raubenheimer, R. Sugden, M. Rodríguez-Gironés

A. Kacelnik, S. Shafir, L. Pompilio, C. Schuck, S. Kipper, H. Hultsch