Editorial introduction

Two special issues on Risk

The options confronting organisms are differentially "risky", and economists, psychologists, and evolutionary biologists have all been interested in specifying exactly what this proposition means, and how decision makers deal with risk. Although these fields have developed their approaches to the topic more or less independently, with the result that there are some subtle and potentially confusing differences in methodology and vocabulary, they have nevertheless converged on common conceptualizations. Risk is typically operationalized as outcome variance in some proximal currency (such as money or calories), and appropriate response to risk is construed as a matter of maximizing expected returns in some more distal currency ("utility" in economics, "fitness" in biology) which is nonlinearly related to, and usually less directly measurable than, the proximal currency.

In addition to defining risk as outcome variance, economists and behavioral ecologists have also converged on an essentially similar "normative" approach: avoiding the daunting question of *how* creatures actually make their decisions under risk, both fields initially focused on the more tractable problem of identifying optimal policies for decision-makers, who were imagined to come equipped with perfect knowledge of payoff magnitudes and probabilities and an innately given function linking the proximal and distal currencies. Of course, the problem of optimal choice becomes much less tractable if the organism's knowledge is *not* perfect, and theorists therefore called this a *different* problem: decision making under "uncertainty", rather than under "risk". And as for the hazards of death or injury that one might ordinarily encompass in the word "risk", these too were set aside as quite another matter.

From an evolutionary perspective, this narrowing of the scope of risky choice seems artificial. Few problems in nature present people (or other animals) with choices for which payoffs and their probability distributions are precisely known. Rather, natural selection equips animals with what amount to statistical expectations based on ancestral contingencies, so decision-making under "uncertainty" and decision-making under "risk" surely rely on the same evolved psychological and physiological processes. For similar reasons, the insistence that risk must be defined strictly as payoff variance, with the ordinary English meaning component of danger excluded, seems unduly restrictive. Like the distinction between risk and uncertainty, this stricture, too, is motivated by mere considerations of analytic tractability–it's hard to do your optimality analysis when gains are tallied in one currency, such as calories or mating opportunities, and losses in another, seemingly incommensurate currency, such as injury or death–rather than by evidence that distinct decision processes are involved.

Escaping these traps requires first that we recognize that there *is* a common currency after all, in the coin of expected fitness, and that people (and other animals) do indeed behave in ways that effectively weight costs such as the risk of death against benefits such as mating opportunities. The implication, we believe, is that the ordinary English usage by which "risk" encompasses both uncertainty and peril as well as payoff variance is not, after all, just a bad habit that scientists should get over, but a reflection of a profound commonality. Analysis of "risky choice" in all these senses can be and should be integrated.

Happily, this integration is in progress. Uncertainty is becoming part of the analysis of decision making under risk as a result of efforts to model and measure subjective probability (or its implicit equivalent) and to incorporate costs of information acquisition (reduction of uncertainty) into analyses of optimal policy. Danger, too, is beginning to be incorporated into optimality analyses, by making the distal utility or fitness currency a function of more than one proximate currency.

Thus, as in so many areas of the social and biological sciences, evolutionary thinking appears to hold the key to interdisciplinary synthesis, and with this in mind, we put out a call, in December, 2000, for submissions for a special issue of *Evolution & Human Behavior* on the topic of risk. The response was remarkable: original theoretical and empirical contributions flowed in from half a dozen academic disciplines. During the ensuing review process, of course, some papers were found to be flawed or too preliminary for publication, and some others were insufficiently evolution-minded for this journal. Still, we received so many high quality submissions that we ended up scheduling two special issues instead of just one. The first (volume 23, # 1) is the issue that is now in your hands, and the second will appear later this year. We hope that our readers will find the breadth of contributions on this topic as stimulating as we have.

Martin Daly
Margo Wilson