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REPLY

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REPLY TO PROFESSOR HARSANYI

JOSEPH B. KADANE AND PATRICK D. LARKEY

Our differences with Professor Harsanyi are not as profound as might appear. His principal source of discomfort with our paper seems to be the indeterminancy that results from our inability to tell you what your opponent is likely to do. Our suggestion is that this is an empirical matter, and that we need studies of how different sorts of people play different sorts of games. Professor Harsanyi's position, as we understand it, is that you should assume that your opponent is "rational" and then decide what "rationality" implies for his behavior in the particular game in question, and act accordingly.

Thus we agree with Professor Harsanyi that "in deciding on the best strategy against an actually or potentially irrational opponent or opponents, normative game theory can provide only indirect help. Rather, what we need is an empirically supported *psychological* theory making at least probabilistic predictions about the strategies people are likely to use, . . . given the nature of the game and given their own psychological makeup. If we had such a theory, deciding on their best strategy against such an opponent . . . would . . . involve . . . a solution of a simple maximization . . . problem." We would add only that the empirical data cited in our paper supports the conclusion that opponents tend to be "actually or potentially irrational," and hence we attach urgency to further psychological research on actual behavior of people making decisions in game situations.

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REJOINDER

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REJOINDER TO PROFESSORS KADANE AND LARKEY

JOHN C. HARSANYI

Frankly, I do not think it would serve any useful purpose to minimize the importance of our disagreement because it is about the very foundations of game

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theory. We all agree that game theory—at least as commonly practiced by game theorists—is essentially a study of the question of how to act in game situations against highly *rational* opponent(s). But while Professors Kadane and Larkey feel that preoccupation with this question is a serious mistake, I think that this line of inquiry actually is, and has always been, the main intellectual attraction of game theory, ever since von Neumann and Morgenstern. In fact, the importance that game theorists attach to this problem is easy to understand:

(1) The concept of rational behavior plays a fundamental role in economics, in other social sciences, and in several branches of philosophy, so as to make *theoretical* clarification of this concept an intellectual task of utmost importance.

(2) It is also a concept of great *practical* significance. As experience shows, even though people do not always act very rationally, in economic and other strategic situations rational behavior is sufficiently common so as to make it imperative for all of us to understand what strategies are open to a rational opponent, and so as to make it extremely dangerous to underestimate an opponent's ability to act rationally.

(3) As Kadane and Larkey correctly argue, according to Bayesian decision theory, a rational player will base his behavior on his *expectations* (subjective probabilities) concerning the other players' likely strategies. But they do not seem to realize how important a *normative* theory of rational behavior in game situations is for formulating realistic expectations about the other players' strategies and, eventually, for developing a realistic descriptive—i.e., explanatory and predictive—psychological theory of game behavior.

No psychologist studying how people perform arithmetic computations can develop a realistic *descriptive* theory of computing behavior without knowing arithmetic, i.e., without knowing the *normative* theory of correct computations—for he must explain any given computation move *either* as the *correct* move prescribed by normative arithmetic, *or* as a psychologically understandable *deviation* from the correct arithmetic procedure. Likewise, a psychologist trying to explain a move by a given player in a game must explain it *either* as a move justified by normative game-theoretical rationality, *or* as a psychologically understandable deviation from it. [See Harsanyi, 1977, pp. 16–19.]

Accordingly, I submit that it is a serious mistake to deny the great value of normative game theory as an intellectual tool for a philosopher, a social scientist, or a practical decision maker involved in conflict situations; and that any disagreement about the scientific relevance of normative game theory is in fact a disagreement of fundamental importance.

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