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The Formulation of Rational Choice

By AMARTYA SEN*

Consider the description of a “rational” person in traditional economic theory, or standard game theory. As Roger Myerson (1991 p. 2) lucidly presents the prevailing view of the matter, “a decision-maker is rational if he makes decisions consistently in pursuit of his own objectives.” Myerson goes on to explain that “we assume that each player’s objective is to maximize the expected value of his own payoff, which is measured in some utility scale.” The payoff function is a real-valued representation of the person’s preferences over the outcomes. Rationality is seen as intelligently maximizing such a payoff function, using all the available instruments, subject to feasibility.¹

This canonical formulation of “rational choice” in standard theory is critically scrutinized in this note, identifying distinct inadequacies in different contexts. The need for context-dependent parametric variations in the characterization of rational choice is outlined. The general problems are illustrated in the specific case of monitoring and work motivation.

I. Menu Dependence

In the “utility scale,” person i ’s payoff $U_i(x)$ is seen as a function of the outcome x . This is the way that choice behavior is typically axiomatized. This formulation has some difficulty in accommodating “social” behavior such as not picking the last apple when the fruit basket goes around, or not grabbing the uniquely largest slice of cake, since the valuation of outcomes here is

“menu-dependent.” Menu-dependence can arise also from many other types of behavior involving more complex considerations of ethics and epistemology (see Sen, 1993a). There is, however, nothing in the idea of payoffs that prevents a payoff function from having as arguments not just the *actual* outcomes (x) that will emerge, but also the anticipated set of alternative outcomes (S) —“the opportunity set” or “the menu,” which the person reckons she *can* have through different choices of her strategy (given her presumptions about the others’ behavior).

Menu-dependent behavior, while socially important, would tend to violate some commonly used properties of internal correspondence of choice, or “internal consistency of choice” (as it is often called—begging a question about what form consistency must take). An example of such an internal-consistency condition is the following: if x is chosen from a set T and belongs to a subset S of T , then it must be choosable from S . This is violated by menu-dependent behavior (e.g., an apple that is nicely choosable may cease to be so if the set of alternatives is reduced to make it the last apple in the basket). “Binariness” or “rationalizability” of choice, as they are typically defined (i.e., over sets of outcomes only), would be violated too. With that would go real-valued representation of preference orderings over the outcomes. This does not, however, require abandoning *maximization* as an operation. Instead, the function to be maximized would have to be defined over the pair (x, S) of outcomes and menus, rather than over outcomes x only.

II. Multiple Interpretations and Preference

Moving from the *form* to the *interpretation* of preference, one can ask what the preference ordering stands for. Insofar as the preference ordering is the “support” for predicting a person’s behavior, it must be deeply relevant for the person’s choice (seen

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¹See David Kreps (1988) for a classic exploration of this approach and its implications.

as maximization based on that preference ordering). I will call it the *choice-salience interpretation* of preference. But as the term “payoff” suggests, there is also some presumption that the preference relates to the person’s own gain from the outcome in question. In economic theory, in particular, the goal to be maximized, reflected in the preference ordering, has been typically seen as the person’s own well-being. I will call it the *well-being interpretation* of preference.

Both interpretations—based respectively on choice-salience and well-being—have some plausibility, but they are not the same. To take them to be the same involves a substantive *empirical* assumption that a person’s choices must be governed by the maximization of her own well-being. Many central results in economic theory depend on the presumed congruence of well-being and choice-salience, such as the Arrow-Debreu “fundamental theorem of welfare economics” (Kenneth Arrow, 1951; Gerard Debreu, 1959), which relates competitive equilibria (seeing preference in terms of choice salience) with Pareto efficiency (seeing preference in terms of individual welfares).²

A divergence between choice and well-being can easily arise when behavior is influenced by some motivation other than the **pursuit of one’s own interest or welfare (e.g., through a sense of commitment, or respect for duty)**. The issue here is not that of altruism as such. Individual well-being can certainly take good note of a person’s sympathy (or antipathy) for others (see e.g., Gary Becker, 1976, 1981). Rather, the question is whether the influence of other-regarding concerns is restricted only to the extent to which they enter the person’s own welfare function, either directly (e.g., suffering at others’ pain) or indirectly (e.g., feeling disappointed or dejected when attempts to help others—for whatever motive—are frustrated).³

²However, by using the choice-salience interpretation only, competitive equilibria can be seen to be “weakly efficient” in freedoms, rather than welfares (Sen, 1993b).

³The question here corresponds to the distinction between “sympathy” and “commitment” in Sen (1977).

Can people have reason to act other than the extent to which their own well-being is directly or indirectly enhanced by it? The belief that individuals, as free and rational agents, are capable of going *beyond* the exclusive pursuit of their respective well-being was strongly asserted by classical authors such as Adam Smith (1759, 1776). Smith, in particular, distinguished actions motivated by “prudence” (taking into account indirect as well as direct advantages) from those influenced by “sympathy,” “generosity,” and “public spirit,” to each of which he gave a distinct and differentiated role.⁴ The variability of motivations was explicitly accepted also by the pioneers of utility theory in economics (such as John Stuart Mill, William Stanley Jevons, Francis Y. Edgeworth, and Alfred Marshall), though this issue is rarely addressed in modern economic theory.

III. Action Ethics and Behavioral Norms

Another important qualification concerns the relationship between the evaluation of *actions* and the assessment of *consequences*. In game-theoretic formulations, a person has a set of clearly defined individual strategies, and the exercise of maximization concerns picking a maximal strategy from that set (including randomization over these strategies). There may, of course, be complicated *strategic* considerations related to such behavior, which can be particularly important when the game is repeated (see David Kreps, 1990; Myerson, 1991; Drew Fudenberg and Jean Tirole, 1992). But there is, in this framework, no further ethical consideration in the choice of actions and strategies (i.e., “further” to what is already incorporated in the person’s objective function). Given the feasibility of a strategy, the only issue that influences its choice by a person is its direct and indirect effectiveness in promoting her objective function.

⁴See Smith (1790 [Section IV, Chapter 2]); in D. D. Raphael and P. L. Macfie’s (1975) edition, pp. 187–93. On Smith’s concerns see, among others, Raphael and Macfie’s introduction, Sen (1987), Patricia Werhane (1991), and Emma Rothschild (1992).

This formulation of the choice problem contrasts with Adam Smith's analysis of appropriate actions in the context of public policy: "In these and in all other cases of this kind, our admiration is not so much founded upon the utility, as upon the unexpected, and on that account *the great, the noble, and the exalted property of such actions*."⁵ There is, in this view, a distinct assessment of actions that is not identified with the evaluation of the useful consequences (what Smith calls the "utility") of that action seen on its own (though Smith does discuss the good consequences of people in general following such rules of behavior).

An important case of such action-judgments concerns situations of social interdependence such that every member of the group does better by treating as "the unit of choice" their *joint* strategy. An example is the unrepeated prisoner's dilemma. Choosing to be "cooperative" in such a situation (i.e., *not* confessing) would involve selecting an individual strategy that is strictly *dominated*, and it would entail a violation of standard formulations of individual rational choice.

Yet if some action-ethic, like the one that Smith describes (he relates it, incidentally, to acting according to the view of an "impartial spectator"), makes the people involved impose restraints on their own instrumental choice, they could all end up having more fulfilment of their *unmodified* preferences.⁶ This line of reasoning relates also to the Kantian requirements of action morality; for example, "Act always on such a maxim as thou canst at the same time will

to be a universal law."⁷ Obviously, confessing oneself is not such an act in the prisoner's dilemma, since neither prisoner wants that behavior to be "universal." The Smithian-Kantian *self-imposed restraints* differ from constraints given from outside.⁸

IV. Work Motivation and Behavioral Modes

How does all this relate to the problem of monitoring work performance? One of the general issues to emerge from the preceding discussion is the need to take what one may call a "parametric" view of rational choice. Do the possibilities explored in earlier sections relate to any observed regularities in work, motivation, and monitoring? There are some suggestive empirical data in that direction.

First, there is considerable evidence that the view that is taken of work responsibilities varies greatly from one society to another. These cross-section comparisons can be supplemented by evidence of intertemporal change as a result of movements of social tradition, an old subject discussed, for example, by Karl Marx, Richard Henry Tawney, and Max Weber, among many others. Social traditions can indeed be relevant in the formation of objective functions as well as in the specifics of action ethics.

Recently, attention has been drawn to the special sense of collective responsibility that

⁵Smith (1790 [Section IV, Chapter 2]); in Raphael and Macfie's (1975) edition, p. 192; italics added.

⁶The problem being discussed here, which arises most unambiguously in the case of *unrepeated* prisoner's dilemma (though it can coexist with some types of repetitions as well), must be distinguished from the issue of cooperation in *repeated* prisoner's dilemma. An incentive for cooperation can be directly derived just from the pursuit of one's own objective function if the prisoner's dilemma is repeated indefinitely, and to some extent, even when the repetitions are finite but combined with some specific epistemic conditions (see Fudenberg and Tirole, 1992).

⁷Immanuel Kant (1785); in T. K. Abbott's (1907) translation, p. 66. For discussions of this and related issues, see Sen (1973, 1977, 1987), Derek Parfit (1984), and Susan Hurley (1989). On connected matters, see also John Harsanyi (1976), Albert Hirschman (1982), George Akerlof (1984), and Robert Frank (1985), among many other contributions.

⁸It is, of course, possible to translate the impact of instrumental constraints—even self-imposed ones—into *reconstructed* "objective functions" through such devices as Lagrangean multipliers. But then the interpretation of the "objectives" would have to be correspondingly different and contingent (in the way the values of Lagrangean multipliers must be). The crucial issue here is not whether the "maximizing format" can continue to work in the Smithian-Kantian case (it certainly can), but whether there are reasonable arguments that support self-imposition of action norms, with a deliberate restriction of instrumental possibilities.

apparently prevails more abundantly in Japanese industrial relations than in the West, though the explanation given for this agreed phenomenon has varied between distinct theories (see e.g., Michio Morishima, 1982; Ronald Dore, 1987; Masahiko Aoki, 1989). These theories include alternative attempts at explaining why, as *The Wall Street Journal* put it (stretching a point somewhat), Japan is "the only communist nation that works" (30 January 1989, p. 1).

Second, one of the observed phenomena in behavioral norms is the tendency to imitate others, much commented on recently in the context of explanations offered for corrupt activities in business and politics in Italy: "I was not alone in doing it" (see Camera dei deputati, Roma, 1993). This type of reasoning, on the one hand, points to the need to bring in the influence of established norms of behavior in explaining what actions will or will not be chosen, and on the other, it indicates that individual choices may often take a menu-dependent form (similar to not picking the last apple). A person may refrain from seizing a unique opportunity of breaking an implicit moral code and yet be willing enough to break that code if there are many such opportunities (either because the departures might then seem more "usual," or because the person expects that some others would possibly grab one or more of the remaining opportunities).

Third, based on a widely observed phenomenon in both rich and poor countries, indicating the coexistence of relatively high wages and involuntary unemployment at those wages, there has been an extensive literature on "efficiency-wage models." As Akerlof and Janet Yellen (1986 p. 2) have discussed, the benefits of higher wage payments (above market-clearing wages) can be of different types, including "reduced shirking of work due to a higher cost of job loss, lower turnover, improvement in the average quality of job applicants, and improved morale." These are very diverse benefits.⁹

⁹On this and related issues, see also Akerlof (1982, 1984).

Whereas connecting the higher cost of job loss to reduced shirking may be fairly adequately done through the presumption of self-interested behavior, there would be a more complex connection between "morale" and actual work effort.¹⁰

On the basis of a "cross-national" study of monitoring and supervision, David Gordon (1994) has presented an interesting empirical analysis of variations in "the bureaucratic burden" among 16 advanced economies in the OECD. He defines that "burden" as the relative proportion of "administrative and managerial workers" among total employees in nonfarm occupations (though he also considers variations of this measure). That "burden," for 1980, ranges between 2.5 percent in Sweden to 11.5 percent in the United States, which is the highest in the list (with the next three positions being taken by the other English-speaking countries, to wit, the United Kingdom, Canada and Australia). In the longer, unpublished version of Gordon's paper (available from Gordon upon request), he considers possible explanations of these variations, and while he finds a general connection here with the use of higher "efficiency wages" as an alternative to supervision, he also notes that the differences in labor relations appear to reflect structural differences in institutions, norms, and culture.¹¹

¹⁰Indeed, as Robert Solow (1990 p. 22) has observed, "wage rates and jobs are not exactly like other prices and quantities," and "they are much more deeply involved in the way people see themselves, think about their social status, and evaluate whether they are getting a fair shake out of society."

¹¹To comment on a particular issue, the position of Japan in Gordon's (1994) study fits uneasily with the wide literature on the hold of work ethics and shared responsibilities in that country. Japan's "burden" of 4.4 percent is closer to Sweden's (2.5 percent) than to that of the United States (11.5 percent), but it is still a very middling performer (with the tenth lowest "burden" in a list of 16). It appears, however, that given the nature of "life-long" employment relations in Japan, a significant proportion of workers, as they mature in the respective firms, are rewarded by being given "administrative and managerial" positions without their being actually involved in monitoring or supervising other employees (on this see Dore [1993]).

The wide intercountry variations in behavior patterns and in the need for monitoring certainly do suggest the case for more parametric formulations of rational choice, with varying relationships (i) between choice-salient objectives and personal well-being and (ii) between individual and social instrumentalities.¹²

V. Concluding Remarks

While the reformulations of rational choice discussed here tend to make more room for "less self-centered" views of rationality, I should avoid giving the impression that more "social" behavior must invariably be more conducive to identifiable requirements of social justice. Some of the nastiest things in the world happen as a result of "selfless" pursuit of objectives far removed from one's own well-being but also from the well-being and freedoms of others (such as communal rioting or racist violence).¹³

Also, while social behavior may contribute to group cooperation in such classic cases of atomistic failure as the prisoner's dilemma, that dilemma is very limited in its formulation, in that there is a *uniquely* Pareto-superior outcome over the atomistic result, so that the question of justice in the *division* of gains between the parties is simply avoided. When there are alternative divisional arrangements, some could be taken to be acceptable on grounds that may be far removed from justice (such as historical convention).¹⁴

¹²However, on the basis of Gordon's (1994) observations alone, it is not yet possible to discriminate between (i) variations within the standard model that would be brought about by different social and economic circumstances and (ii) variations of the basic model itself in the lines outlined earlier in this paper. Gordon's empirical findings strongly suggest the need for follow-up analysis to explore this type of discrimination and also the distinction between the different ways in which "social behavior" may work (e.g., between broadening the objective function and the self-imposition of action constraints).

¹³On this see Sen (1977) and particularly Samuel Brittan (1993).

¹⁴The issue of "salience" in coordination or bargaining problems has to be distinguished from that of social optimality or justice; on this see Thomas Schelling (1960).

In those circumstances, the formulation of "selfless" objectives and adherence to "cohesive" action-ethics can, in many cases, help to sustain extensive inequities. For example, there is much evidence that valuing the cohesion of the family in many gender-unequal societies can actually serve to perpetuate the unequal position of women, by making women themselves give priority to the alleged interest of the family over personal well-being, and also by inducing a view of "jointness" of efforts within the family to sustain unequal provisions.¹⁵ Similar problems arise in many other areas of group cooperation, even in industrial relations.

The need for making more room for other-regarding concerns in the formulation of rational choice would seem to be strong on grounds of better description and greater explanatory and predictive power. Despite their ethical origin, however, the social effects of these concerns need not necessarily be conducive to equity or justice, in any obvious sense. That is a separate issue which calls for a more context-dependent answer.

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¹⁵I have tried to discuss this issue in Sen (1990).

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