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CARDINAL WELFARE, INDIVIDUALISTIC ETHICS, AND INTERPERSONAL COMPARISON OF UTILITY: COMMENT

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NOT very recently, Professor John Harsanyi (1955) presented in this *Journal* three appealing axioms for social choice under uncertainty which lead to the conclusion of a social welfare function which is additive in individual utilities. While not directly addressing his defense of these axioms, I wish to argue that one of them is not consistent with notions of justice held by some individuals.[1] Since this is an ethical discussion, the argument will take the form of an example which suggests the problem inherent in the axiom and some comments on the nature of the example.

Harsanyi's three axioms are: (1) individual decision making satisfies the axioms for expected utility maximization; (2) social welfare can be written as an increasing function of individual expected utilities; and (3) social choice satisfies the axioms for expected utility maximization. It is the third axiom with which I wish to quarrel.

In mathematical terms, we can express the first axiom as individual choice conforms to the maximization of expected utility, v_i, where

$$v_i = \int u_i [c_i(\theta)]\, dF(\theta) \,, \qquad (1)$$

with u_i being the utility function of the ith individual; $c_i(\theta)$, his consumption in state θ; and $F(\theta)$ the probability distribution of the states of nature.

The second axiom is that social choice should conform to the maximization of welfare, w, which can be written as a function of individual expected utilities:

$$w_1 = f_1 (v_1, v_2, \ldots, v_n) \,. \qquad (2)$$

This axiom implies that social choice can be expressed as a choice among vectors of expected utilities, which are determinate, not random, and thus social choice under uncertainty need not be considered.

The third axiom says that the social objective function can be written as expected welfare (with welfare a function of individual utilities):

$$w_2 = \int f_2 \{u_1 [c_1(\theta)] \,, \; u_2 [c_2(\theta)] \,, \ldots, \, u_n [c_n(\theta)]\}\, dF(\theta) \,. \qquad (3)$$

These three axioms imply that welfare can be written additively,

$$w = \sum_{i=1}^{n} \lambda_i \int u_i [c_i(\theta)]\, dF(\theta). \qquad (4)$$

(In the presence of differing individual subjective probabilities, a case not considered by Harsanyi, these three axioms are inconsistent.)

As an example, let us consider a society composed of two identical individuals, A and B, facing a choice between two alternatives, α and β, with two possible and equally probable states of nature, θ_1 and θ_2. Let us further assume that social choice, in addition to satisfying the first two axioms above, is symmetric in its treatment of the two individuals. It is assumed that under alternative α, the utility of A is 1 and that of B is zero, independent of the state of nature; while under β, these are the utility levels if θ_1 occurs, but they are reversed if θ_2 occurs. In tabular form, we have

[1] This comment is also relevant for part of the Robert H. Strotz paper (1958). For further discussion of these matters, see also Franklin M. Fisher and Jerome Rothenberg (1961, 1962) and Strotz (1961).

	if θ_1 occurs	if θ_2 occurs
Alternative α:	$u_A = 1$, $u_B = 0$,	$u_A = 1$, $u_B = 0$,
Alternative β:	$u_A = 1$, $u_B = 0$,	$u_A = 0$ $u_B = 1$.

Harsanyi's third axiom, in combination with the other assumptions, leaves society indifferent between the two alternatives. However, β seems strictly preferable to me, since it gives B a fair shake while α does not. (In terms of expected utilities, under α we have $v_A = 1$ and $v_B = 0$ while under β, $v_A = v_B = \frac{1}{2}$.)

I am willing to accept the sure-thing principle for individual choice but not for social choice, since it seems reasonable for the individual to be concerned solely with final states while society is also interested in the process of choice.

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