SOME FOUNDATIONAL ISSUES IN THE FUNCTIONING AND CAPABILITY APPROACH TO THE CONCEPT OF WELL-BEING

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Contents

1. Introduction
2. Basic features of the functioning and capability approach
3. The contrast between the functioning and capability approach and some alternative approaches
4. Some conceptual issues
5. The concept of deprivation in the functioning and capability approach
6. An overall assessment
Acknowledgements
Glossary
Bibliography
Biographical Sketch

Summary

This chapter deals with some foundational issues in the functioning and capability approach to the notion of a person's well-being. After presenting an outline of the basic ingredients of this approach, we compare it with alternative conceptions of well-being, such as subjective conceptions of well-being and resource-based conceptions of well-being. Next we discuss some important conceptual and practical issues in the functioning and capability approach, namely, the identification of the relevant functionings, aggregation over the various dimensions of well-being so as to arrive at an assessment of an individual's overall well-being, the ranking of capability sets, and the notion of capability sets of individuals in interactive situations where, in general, the functioning bundle of an individual is determined by other individuals' actions as well as her own action. We also discuss issues involved in identifying deprived individuals and measuring the overall deprivation of an individual who is identified as being deprived. We conclude with an overall assessment of the approach.

1. Introduction

The concept of human well-being is of vital interest in many areas of social sciences and moral philosophy. In particular, it is of central importance in all matters relating to

the formulation of public policies. Even those who take the position that human well-being is not the only consideration relevant for assessing the goodness of public policies are unlikely to deny that human well-being is one of the most important considerations relevant for that purpose. But what exactly constitutes human well-being? This is a difficult issue, and, understandably, there are different answers. The purpose of this chapter is to examine one particular approach to this problem, namely, the functioning and capability approach (FC approach, in short), which has been discussed and used widely over the last thirty years or so following the seminal contributions of Sen (1985, 1987) and Nussbaum (1988, 2000). Our main focus will be on the basic conceptual and analytical structure of this approach to the notion of human well-being, and will not touch on issues relating to equality and justice based on the FC approach. We will not seek to provide a comprehensive survey of the literature; in particular, except for a few occasional remarks, we shall not be concerned with the large body of literature that deals with empirical applications of the general analytical framework.

The plan of the chapter is as follows. In Section 2, we outline the intuition underlying the FC approach and its formal structure. In Section 3, we contrast it with some other approaches to the notion of human well-being. Section 4 deals with several important issues in the FC approach. In particular, we discuss in this section: (i) the issue of identifying the functionings which constitute one of the basic building blocks of the analysis; (ii) the problem of aggregating the different dimensions of well-being of an individual so as to determine the level of her overall well-being; (iii) the ranking of capability sets (i.e., the set of all functioning bundles available to an individual) in terms of the freedom of choice that they offer; and (iv) the issue of how to conceive the capability set in a world where the functioning bundle of an individual may depend on other people's actions as well as her own action. In Section 5, we consider the application of the approach to the problem of measuring deprivation. We conclude in Section 6 with an overall assessment of the approach.

2. Basic Features of the Functioning and Capability Approach

In this section, we discuss the basic features of the FC approach in some detail.

2.1. Functionings: The Building Blocks of the Functioning and Capability Approach

Functionings are the "beings" and "doings" that people value in their lives (see Sen 1987, p. 29). "Being healthy", "being sheltered from the elements", "being educated", and "participation in the life of one's community" are some examples of functionings. An individual may achieve different levels of a functioning. For instance, for the functioning of being healthy, the different levels or values may be the following: bad health, fair health, good health and excellent health. A vector specifying a level of each functioning is called a functioning bundle.

The role of functionings in the FC approach is analogous to the role of commodities in the economic theory of consumers' behavior, but functionings are different from commodities. Commodities are the means for achieving various functionings; it is the functionings, not the commodities as such, which constitute the ends that people value

in their lives. Thus, commodities, such as apples, meat, etc. are the 'means' or 'inputs' for achieving the functioning of being well-nourished, while, in a cold country, commodities such as coal are the means for achieving the functioning of being protected from the elements. Functionings are also different from characteristics of commodities, as conceived by Lancaster (1966). Characteristics of a commodity are the various physical, chemical, engineering, and biological properties it possesses. The vitamins and calories constitute some of the characteristics of commodities such as apples and milk; reliability, safety and comfort of transportation are the characteristics of automobiles; and so on. Characteristics themselves do not have intrinsic value, but are instrumental in achieving the goals that people have; for instance, protein, calories, etc., which are characteristics of items of food, are valued not for their own sake but for being well-nourished. The characteristics constitute a step beyond commodities towards what people value intrinsically, but they still fall short of those intrinsically valuable ends. Characteristics of commodities are independent of individuals' circumstances, while the amounts of functionings that a person can achieve with given amounts of characteristics are dependent on the circumstances of the individual: a given amount of calories, which may be adequate for a person with a sedentary occupation, may be quite inadequate for somebody doing hard physical work.

Given a bundle of commodities, an individual may be able to achieve any one of several alternative functioning bundles. Thus, a given amount of leisure and other commodities can be used to generate various alternative combinations of recreation and interaction with family and friends. The set of (mutually exclusive) functioning bundles that an individual can possibly achieve with a given commodity bundle depends on the geographic and climatic conditions, the individual's physical and psychological features, and her social and political environments. In a very moderate climate, the individual does not need much fuel to be comfortably warm/cool. A certain amount of food may be adequate for a person of small stature but inadequate for a person of large stature. A person who lacks proper knowledge can destroy many of the nutrients in vegetables by overcooking the vegetables, but a knowledgeable person can get more nourishment from the same vegetables by avoiding overcooking. Finally, university education may be free for all in a country but social taboos may prevent women from being educated in universities. Given these other conditions, however, one can think of each commodity bundle being associated with a set of (mutually exclusive) functioning bundles which can be achieved by the individual under consideration with that commodity bundle.

It may be helpful to use a few notations here. Let R be the set of real numbers and let R_+ be the set of all non-negative real numbers. Let there be n commodities (there need not necessarily be markets for all commodities some of which may be public goods) and let R_+^n be the consumption space of the consumer under consideration. Let $F = \{f_1, \ldots, f_m\}$ be the set of $m > 1$ relevant functionings. For every functioning f_j, let X_j be the set of values or levels that functioning f_j can have. For the sake of convenience, we shall assume that, for every functioning f_j, X_j is a (non-empty) set of real numbers, a higher real number indicating a larger amount of functioning f_j. When

a functioning f_j can be measured continuously, X_j is typically an interval, and when a functioning f_j can only take several values, X_j is a discrete set. Some functionings, such as being sheltered from the element and being educated may be cardinally measurable so that, not only may it make sense to talk about more or less of the functioning, but it may also make sense to talk about the increase/ decrease in the amount of functioning in one case being greater than the increase/decrease in the amount of the functioning in another case. Often, however, functionings are only ordinally measurable so that comparisons of changes in the amount of the functioning under consideration is not possible though one can talk about an increase or decrease in the amount of the functioning; being healthy is a conspicuous example of such a functioning.

Let X denote $X_1 \times X_2 \times \ldots \times X_n$ .We assume that, for each individual i , there is a correspondence
c^i , which, for every commodity bundle e in R_+^n specifies exactly one non-empty subset $c^i(e)$ of X . $c^i(e)$ is to be interpreted as the set of different functioning bundles any one of which individual i can generate if she possesses the commodity bundle e . As we have noted in the intuitive explanation given earlier, the correspondence c^i will be determined by the individual's physical and psychological features, and the individual's natural, social and political environments.

2.2. The Capability Set

The concept of capability or capability set (we use the two terms interchangeably) is an important component of the FC approach to well-being. An individual's capability or capability set is the set of all mutually exclusive functioning bundles which are feasible for the individual under consideration and any one of which he can choose to have. An individual's capability set reflects the individual's freedom or opportunities to choose.

Formally, for every individual i , let Y^i be the set of all commodity bundles available to i . If we assume that there are competitive markets for all relevant commodities, then the set of all commodity bundles available to the individual in a competitive equilibrium is simply the individual's budget set, i.e., the set of all commodity bundles satisfying the individual's budget constraint given by the competitive equilibrium prices and her initial endowment of commodities. Then, given the correspondence c^i , which, as we noted earlier, is determined by i 's physical and
psychological features and i 's natural, social and political environments, the capability set of the individual is given by $A^i = \bigcup_{e \in Y^i} c^i(e)$. The individual decides which functioning bundle in A^i she will have.

The capability set of individual i reflects the extent of freedom or opportunity that i enjoys to choose a functioning bundle, given all her constraints – resource constraints as well as the constraints imposed by her natural environment, her own physical and psychological features, the society, and the state. While the capability set is the result of

all these constraints, it does not, by itself, give us much information about the role of specific constraints. Thus, if all functioning bundles in the capability set of a woman, i, involve very small amounts of education, it may be because of lack of resources (which will affect the capability set via her budget constraint or it may be because of the decrees of a theocratic government (such decrees will affect the capability set via the correspondence c^i). Thus, the capability set reflects the positive freedom of the individual as well as her negative freedom (see Berlin (1958) and MacCallum (1967) on the distinction between positive freedom and negative freedom.

2.3. Well-being

In the FC approach, the well-being of an individual is affected by her achieved functioning bundle and/or her capability set. There are three distinct positions that one can take here:

(2.1) the well-being of an individual is determined exclusively by her achieved functioning bundle;
(2.2) the well-being of an individual is determined exclusively by her capability set; and
(2.3) the well-being of an individual is determined by both her achieved functioning bundle and her capability set.

Given the practical difficulties of specifying an individual's capability set, it is tempting to resort to the assumption that an individual's well-being depends exclusively on her achieved functioning bundle, and, understandably, many applications of the FC approach focus exclusively on the achieved functioning bundles. The idea that a change in an individual's freedom of choice can affect the individual's well-being independently of any change it may induce in the individual's realized functioning bundle is, however, an attractive analytical feature of the FC approach. Sen's (1987, p. 37) telling comparison between a person, who has the means to eat an adequate amount of food but is malnourished because he fasts for religious reasons, and another person, who is malnourished because of poverty, illustrates the intuition that freedom of choice may be intrinsically relevant for well-being: in Sen's example, the realized outcome (malnourishment) is the same for both individuals but we feel that, in an important sense, the second individual is worse off insofar as he does not have the freedom of choosing to eat adequately. An alternative route of capturing the importance of freedom of choice is proposed by Sen (1987, p.37) where he suggests the possibility of "refining" the notion of a functioning so that the opportunities available to an individual will figure in the specification of a functioning itself. We shall not discuss this further since we believe that Sen's (1985, 1987) main framework, where the functionings are left "unrefined" and the individual's opportunity or freedom is captured by her capability set, provides a conceptually more general and flexible way of introducing freedom as a determinant of the individual's well-being.

In general, many people's moral intuition coincides with that of J. S. Mill (1859, Chapter III, paragraph 2), when he writes fervently about "free development of individuality" as being "one of the leading essentials of well-being" (it may be recalled that the title of Chapter III of Mill's (1859) On Liberty is "Of Individuality, as One of

the Elements of Well-being"). In the functioning and capability framework, the freedom to choose one's own functioning bundle is the counterpart of Mill's freedom to develop one's individuality in a broader context.

From a purely formal point of view, it seems attractive to have a framework which incorporates each of the three positions, (2.1), (2.2), and (2.3), as special cases. In light of this, one can introduce well-being functions for individuals as follows. For every individual i, let W^i be a function, which, for every conceivable capability set A^i of individual i and for every functioning bundle a^i in A^i specifies exactly one real number w^i. We write $w^i = W^i\left(a^i, A^i\right)$ and interpret w^i as the well-being level of individual i, when her capability set is A^i and her achieved functioning bundle is a^i. For our purpose, it is enough to assume that the numbers representing the well-being levels of the individual have ordinal, but not necessarily cardinal, significance; thus, a higher number represents a higher level of well-being as compared to a lower number for the same individual, but the magnitude of the difference between two such numbers may not have any significance. In fact, one could dispense with these real numbers altogether and work only with a ranking of pairs such as $\left(a^i, A^i\right), \left(b^i, B^i\right)$, etc. Given the well-being function W^i, (2.1) holds if and only if we have $W^i\left(a^i, A^i\right) = W^i\left(a^i, B^i\right)$ for every functioning bundle a^i and all capability sets A^i and B^i such that a^i belongs to both A^i and B^i. (2.1) is, therefore, compatible with the well-being function W^i, and, as can be easily seen, so is (2.2).

2.4. Some Terminological Clarifications

Before concluding this section, we would like to clarify the use of certain terms in the literature.

First, the term "capabilities" has been often used differently from the notion of capability or capability set, which, following Sen (1985, 1987), we have used here. The term has been sometimes used to denote the ability to achieve specific functionings; thus, being able to be healthy, being able to have recreation, being able to participate in public life are considered to be examples of "capabilities". Clearly, capabilities in this sense are very different from functionings, such as being healthy, having recreation, participation in public life, etc.: being able to be healthy is different from being healthy. Nor does this use of the term coincide with capability or capability set as we have used it in this chapter: capability (or capability set) in our sense is a set of functioning vectors and not a set of abilities, such as the ability to be healthy, the ability to participate in community life, etc.

If by capabilities one means the ability to secure simultaneously for oneself specified amounts (often interpreted as essential or minimally satisfactory amounts) of the different functionings, then one can talk about one's capabilities without any conceptual difficulty. But in general, in the absence of such specification of the amounts of all the functionings, we find it rather ambiguous to talk separately about the ability to be healthy, to participate in the community's life, to interact with family and friends, and

so on. Given limitations of resources (e.g., time) at one's disposal, to what extent one is able to participate in the community's life may depend on how much recreation one is having, and vice versa. For this reason, we have avoided the term "capabilities" altogether.

Foster and Sen (1997) and Basu and López-Calva (2011) have suggested that the individual's opportunity to choose itself can be regarded as a functioning. If we decide to take this route, it may be useful to distinguish between "primitive" functionings, which are what we have called functionings above, and the "non-primitive" functioning, the freedom to choose as reflected in the capability set, which will be defined in terms of the primitive functionings (Basu and López-Calva (2011) make the corresponding distinction between a "basic" functioning and a "supervenient" functioning). We would not follow this formulation here; so we retain the distinction between functionings and the capability set. It may be noted that, for our purpose here, it will not matter whether we consider the opportunity to choose to be a (non-primitive) functioning or keep, as we do here, the capability set (reflecting the individual's opportunity to choose a functioning bundle) as a dimension of an individual's well-being, which is separate from what we call functionings.

Finally, several closely related terms, such as well-being, personal well-being, interest, and standard of living are used in the literature, sometimes in an interchangeable fashion. We will not make any distinction between the well-being of an individual and his personal well-being, and we shall use the two terms interchangeably. Following Sen (1985, 1987), we would exclude from the notion of an individual's well-being, the achievement of her ethical goals. An individual's success in fulfilling her ethical commitments to promoting redistribution of income in her society so as to benefit the poor or to prevent the extinction of tigers does not necessarily contribute to her well-being, unless, through sympathy, she identifies herself so much with the poor or with the tigers that more income for the poor or the survival of tigers becomes a part of her own personal interest. Is there any distinction between well-being and standard of living? Sen (1985, 1987) suggests that a person's sympathies and antipathies, which enter the conception of well-being ("other things remaining the same, my well-being increases when my children/spouse/parents/cousins/neighbors become better off" or "other things remaining the same, my well-being decreases when my 'obnoxious' neighbors become better off"), should be excluded from the conception of that individual's living standards since the term living standards refers to that individual's living and not to the lives of others. In this paper, our main concern is with the notion of well-being, but, for the sake of simplicity in exposition, we shall assume that neither sympathies nor antipathies are present in our framework, so that Sen's distinction between the notions of well-being and standard of living disappears.

3. The Contrast between the Functioning and Capability Approach and Some Alternative Approaches

To appreciate the exact nature of the FC approach and to see the intuitive motivation for its development, it may be helpful to outline some other approaches to well-being and to contrast the FC approach with these other approaches. This is what we seek to do below.

3.1. Subjective Conceptions of Well-being

Conventionally, economists have used a broadly utilitarian framework for the analysis of human well-being, where the well-being of a person is identified with her utility. But the term utility has been used in different senses by different writers. First, we have the Benthamite notion of utility as pleasure and the absence of pain. There are not many economists now, who think of well-being as pleasure and the absence of pain, though most people, including economists, would probably agree that the absence of excessive pain is a precondition for a reasonable level of well-being.

A far more widely used interpretation of utility is in terms of preference satisfaction or desire fulfillment. In fact, modern microeconomics interprets a person's utility as the fulfillment of her desires, and much of conventional welfare economics, the branch of economics which is concerned with ethical aspects of public policies, identifies a person's well-being with the satisfaction of her desires. In economic model, these desires are often taken to be desires with respect to her consumption of marketable commodities, though the models are flexible enough to include an individual's desires for non-marketed goods (e.g., a pollution-free environment). The justification given for this identification of an individual's well-being with preference satisfaction is often based on two explicit or implicit premises:

(3.1) an individual prefers what she believes to be conducive to her well-being;
and
(3.2) an individual's beliefs about what is conducive to her well-being are correct.

A somewhat weaker justification consists of (3.1) and (3.3) below:

(3.3) the individual's beliefs about what is conducive to her well-being are more likely to be correct than anybody else's beliefs about what is conducive to the individual's well-being.

A third interpretation of utility is in terms of happiness. While both pleasure and happiness refer to states of the mind, happiness usually connotes a more sustained and stable state of the mind as compared to pleasure, which can be a fleeting sensation.

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40. Pattanaik, P. K. (2005). Little and Bergson on Arrow's concept of social welfare. Social Choice and Welfare, 25, 369-379; reprinted in P. K. Pattanaik, Essays on Individual Decision-making and Social Welfare (Delhi: Oxford University Press). [The paper seeks to clarify the difference between Arrow 's concept of social welfare and that of Little and Bergson.]

41. Pattanaik, P.K. (2006). On comparing functioning bundles and capability sets. In J. K. Boyce, S. Cullenberg, P. K. Pattanaik, and R. Pollin (eds.), Human Development in the Era of Globalization: Essays in Honor of Keith Griffin. Northampton, MA: Edward Elgar. [The paper discusses various issues relating to comparisons of functioning bundles and capability sets.]

42. Pattanaik, P.K. and Y. Xu (1990). On ranking opportunity sets in terms of freedom of choice. Recherches Economiques de Louvain, 56, 383-390. [One of the earlier papers that developed a theoretical framework to discuss the problem of ranking opportunity sets in terms of freedom of choice.]

43. Pattanaik, P.K. and Y. Xu (1998). On preference and freedom. Theory and Decision, 44, 173-198. [The paper discusses how and to what extent the information about preferences can be used in freedom ranking.]

44. Pattanaik, P.K. and Y. Xu (2000). On ranking opportunity sets in economic environments. Journal of Economic Theory, 93, 48-71. [The paper discusses the problem of ranking opportunity sets that are derived from economic environments.]

45. Pattanaik, P.K. and Y. Xu (2000a). On diversity and freedom of choice. Mathematical Social Sciences, 40, 123-130. [An axiomatic approach to measuring freedom of choice based on similarities of alternatives.]

46. Pattanaik, P.K. and Y. Xu (2007). Minimal relativism, dominance, and standard of living comparisons based on functionings. Oxford Economic Papers, 59, 354-374. [The paper discusses a difficulty arising from combining two principles, dominance and minimal relativism, in assessing living standards in the FC approach.]

47. Pattanaik, P.K. and Y. Xu (2009). Conception of rights and freedom in welfare economics—a re-examination. In R. Gotoh and P. Dumouchel (eds.), Against Injustice, Cambridge: Cambridge University Press. [An exposition and assessment of various formulations of freedom and rights in welfare economics.]

48. Pattanaik, P.K. and Y. Xu (2011). On dominance and context-dependence in decisions involving multiple attributes. Mimeograph, Georgia State University; forthcoming in Economics and Philosophy. [The paper develops a general framework for discussing some difficulties in various decision problems involving multiple attributes; some of the results in Pattanaik and Xu (2007) emerge as special cases of results proved here.]

49. Puppe, C. (1996). An axiomatic approach to `preference for freedom of choice'. Journal of Economic Theory, 68, 174-199. [A `revealed' preference model for measuring freedom of choice.]

50. Robeyns, I. (2005). The capability approach: a theoretical survey. Journal of Human Development, 6: 93-117. [A survey of the analytical framework of the FC approach.]

51. Robeyns, I. (2006). The capability approach in practice. Journal of Political Philosophy, 14, 351-376. [An account of applications of the FC approach.]

52. Robeyns, I. (2011). The capability approach. Stanford Encyclopedia of Philosophy, http : / / plato .s tanford . edu / e ntries / capability – approach / [A clear exposition of the FC approach developed by Sen and Nussba um.]

53. Roemer, J.E. (1996). Theories of Distributive Justice. Cambridge, MA: Harvard University Press. [A comprehensive account of various theories of distributive justice.]

54. Roemer, J.E. (2005). A new definition of the poverty line. Mimeograph, Yale University. [This paper attempts to give a new definition of the poverty line in a multidimensional framework.]

55. Savaglio, E. and S. Vannucci (2009). On the volume-ranking of opportunity sets in economic environments. Social Choice and Welfare, 33, 1-24. [This paper presents an axiomatic study of the volume-based rule for ranking opportunity sets in terms of freedom of choice. Opportunity sets studied in the paper are polyconvex in the Euclidean space.]

56. Schokkaert, E. (2007). Capabilities and satisfaction with life. Journal of Human Development, 8, 415-430. [An interesting paper which suggests the possibility of determining the relative importance of different functionings by considering their contributions to life satisfaction.]

57. Schokkaert, E. (2009). The capabilities approach. In P. Anand, P.K. Pattanaik and C. Puppe (eds.), Handbook of Rational and Social Choice. Oxford: Oxford University Press. [A lucid survey of the FC approach]

58. Sen, A.K. (1976). Poverty: an ordinal approach to measurement. Econometrica, 44, 219-231. [A seminal paper on the measurement of income poverty in a society.]

59. Sen, A.K. (1985). Commodities and Capabilities. Amsterdam: North-Holland. [A foundational contribution to the FC approach and still one of the best and most lucid introductions to the approach.]

60. Sen, A.K. (1987). The Standard of Living. In G. Hawthorn (ed.) The Standard of Living. Cambridge: Cambridge University Press. [Like Sen (1985) this is a very lucid introduction to the FC approach, though it is somewhat less detailed than Sen (1985).]

61. Sen, A.K. (1991). Welfare, preference and freedom. Journal of Econometrics, 50, 15-29. [An illuminating discussion of the importance of freedom in welfare economics.]

62. Sen, A.K. (1993). Markets and freedom. Oxford Economic Papers, 45, 519-541. [A discussion of the extent to which free markets promote individual freedom.]

63. Sen, A.K. (1999). Development as Freedom. New York: Alfred A. Knopf, Inc. [An attempt to interpret the problem of development as a problem of increasing people's freedom.]

64. Sen, A.K. (2004). Capabilities, lists, and public reason: continuing the conversation. Feminist Economics, 10: 77-80. [In this paper, Sen explains his reservations about having a universally applicable list of functionings.]

65. Sugden, R. (1993). Welfare, resources, and capabilities: a review of Inequality Reexamined by Amartya Sen. Journal of Economic Literature, 31, 1947-1962. [This is a critical review of Sen's Inequality Reexamined and contains an examination of the FC approach as well.]

66. Sugden, R. (1998). Measuring opportunity: toward a contractarian measure of individual interest. Social Philosophy and Policy, 15, 34-60. [This paper develops a contractarian approach to measuring freedom, and argues for the strategy of measuring freedom that a person has to satisfy preferences in general, rather than the actual preferences.]

67. Tadenuma, K. and Y. Xu (2010). The Walrasian distribution of opportunity sets: an axiomatic characterization. Global COE Hi-Stat Discussion Paper Series gd 10-158, Institute of Economic Research, Hitotsubashi University, Japan. [This paper examines the interdependence of opportunity sets in an interactive world, and presents an axiomatic characterization of the opportunity sets arising from the market mechanism.]

68. van Hees, M. (2004). Freedom of choice and diversity of options: some difficulties. Social Choice and Welfare, 22, 253-266. [This paper explores the sensitivity of a freedom ranking of opportunity sets to the diversity of alternatives, and points out the importance of the notion of distance between sets and alternatives in the exercise.]

69. Van Hees M. and M. Wissenburg (1999). Freedom and opportunity. Political Studies, XLVII, 67-82. [This paper discusses difficulties of incorporating various notions of preferences in measuring freedom, and argues that the discussion of the meaning of freedom should be separated from the issue of the value of opportunity sets.]

70. Weymark, J. (2008). Must one be an ogre to rationally prefer aiding the nearby to the distant needy? Presidential Address, 9th International Meeting of the Society of Social Choice and Welfare, June 19-22, 2008, Concordia University, Montreal, Canada. [This paper discusses certain difficulties which arise in individual decisions involving multi-attributes.]

71. Xu, Y. (2004). On ranking linear budget sets in terms of freedom of choice. Social Choice and Welfare, 22(1), 281-289. [This paper presents axiomatic characterization of the volume-based ranking rule of linear budget sets in terms of freedom of choice.]

Biographical Sketches

Prasanta K. Pattanaik: Prasanta K. Pattanaik is Emeritus Professor in the Department of Economics, University of California, Riverside. Educated at Utkal University, India, and the University of Delhi, he taught at a number of universities, including the University of Birmingham (1978-1991) and the University of California, Riverside (1991-2007). He is a Fellow of the Econometric Society, the Public Choice Society, and the Human Development and Capability Association.

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