

The Poverty Line: Methodology and Measurement

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Saunders, Peter

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THE POVERTY LINE: METHODOLOGY AND MEASUREMENT

edited by

Peter Saunders

Papers given at a seminar held on 12 June 1980



Social Welfare Research Centre

THE UNIVERSITY OF NEW SOUTH WALES
P.O. BOX 1 • KENSINGTON • NEW SOUTH WALES • AUSTRALIA • 2033

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Preface

Although it was generally believed in the prosperous post-war years that poverty was not a serious problem in Australia, the pressure for the establishment of a Commission of Inquiry into Poverty and the subsequent publication of the Commission's many reports provide evidence that not all Australians get an adequate share of the nation's resources. The Chairman of the Commission, Professor Ronald Henderson, made an attempt at drawing a 'poverty line', and since then, that line (updated) has formed the basis of much discussion in welfare circles, in political circles, and in academic circles. It has been used to pass judgement on government income security measures, and it also has been used in discussions of levels of living. It has attracted both supporters and opponents, the latter attacking it mainly from a methodological standpoint.

The Commonwealth Government decided, early in 1980, that a study should be undertaken to examine "the whole issue of alternative approaches to measure a poverty line that would be relevant to Australia in the 1980's". By expressing it in these terms it was obvious that there was no one poverty line, nor for that matter, no one view of what a poverty line might do, or how one might arrive at such a line.

Any research into such an issue brings forward the many value issues, measurement issues, and political issues that are woven into contemporary policy social science. Questions about why a line is needed became apparent. Is a poorly constructed line better than no line at all? Will determination of a line lead to improvement of the quality of life of those presently below it? Will too 'generous' a line cause a political reaction from taxpayers? What units should a line be built around — individuals, families, households? What notion of income ought to be used? What data is needed? What data is already held? These are only a smattering of the questions that have to be placed in perspective before efforts are made to place the concept of poverty in Australia in 1980 near a policy threshold. By most accounts (and these varied greatly in research and analytical quality) Australia was not winning the war against poverty and many commentators asserted that the number of those deemed to be poor had increased since 1975.

As the issue of poverty is central to welfare policy for the 1980's the Social Welfare Research Centre at the University of New South Wales thought it appropriate to bring together a number of specialists working in the field so that issues could be discussed and methods debated. The SWRC was fortunate in having Peter Saunders, Lecturer in Economics, University of Sydney as a consultant. He brought together interested people from academia, the welfare sector, and government to contribute to a discussion on the methods of determining a poverty line. The SWRC has, as one of its functions "to arrange seminars and conferences to foster understanding of and to elucidate issues in the field of social welfare". This booklet will help foster understanding and elucidate issues relating to the measurement of poverty in Australia. The authors of the papers write from different disciplinary perspectives in an attempt to broaden our understanding.

Adam Graycar
Director
S.W.R.C.

Introduction: Poverty and the Poverty Line

by Peter Saunders

In order to identify poverty as a social problem distinct from wider issues of social and economic inequality, a poverty line or threshold is required to identify the poor. Clearly the choice of the poverty line is crucial to the absolute size of measured poverty, the composition by age, family size and workforce status of the poor, and the financial cost of resource redistribution required to raise everyone to the poverty line. Not surprisingly, a keen interest has been taken in the construction of the poverty line by academics, welfare practitioners, relevant public servants and politicians, the latter increasingly as government policies have been criticised for failing to solve 'the poverty problem' in advanced industrial economies. Perhaps more surprisingly there exists fundamental disagreement concerning the appropriate basis for the construction of poverty lines, which reflect alternative theoretical approaches to the problem of poverty, whether or not poverty is simply a subsistence phenomenon, and by which income concept, if any, poverty should be assessed.

In Australia we currently have a set of poverty lines for families of differing size and composition, drawn up by the Commission on Inquiry into Poverty and published in its First Main Report in April 1975.¹ However these poverty lines have been the subject of criticism by the Priorities Review Staff (1975), Halladay (1975), Pritchard and Saunders (1978) and Richardson (1978). In recent announcements, the Minister for Social Security, Senator Dame Margaret Guilfoyle, has expressed dissatisfaction with the poverty lines produced by the Poverty Commission (PC), and has asked the Social Welfare Policy Secretariat "to examine the whole issue of alternative approaches to a poverty line that would be relevant to Australia in the 1980's."

In light of these developments, the Social Welfare Research Centre at the University of New South Wales organised a seminar entitled 'The Poverty Line: Methodology and Measurement' to which were invited interested academics and representatives of government departments and welfare agencies. Three papers were presented at the seminar and they are reproduced in the following pages of this report. In this introductory paper, alternative approaches to the concept of poverty and the development of poverty lines will be outlined, followed by a description of the methods used by the PC. The papers given at the seminar will be briefly outlined and the major points which arose in the discussions will be given.

The Definition of Poverty and the Poverty Line

In his discussion of poverty, Watts (1977) distinguishes between the 'narrow economic' and the 'culture of poverty' as competing approaches.² The former focuses on the external circumstances that condition individual behaviour, whilst the latter considers the internal attitudes and patterns of behaviour brought by individuals to any set of circumstances. "The one locates poverty in the person's condition; the other finds it in the person's behaviour."³ The economic definition is admittedly restrictive, in that it ignores sociological, political, psychological and physical ills associated with poverty, but against this Watts argues that it can be clearly identified and, in principle, eliminated. This economic concept sees poverty in terms of severe restriction on the choices of goods and services which individuals and families are able to purchase. Thus people are poor if their resources are insufficient to allow them to purchase a minimum necessary basket of goods and services. They are not required to actually purchase the minimum basket, but merely to have sufficient resources to enable them to do so. If, given sufficient resources, they choose to purchase a different basket, that is their prerogative, given the value judgement that their tastes and preferences are to be respected.

In order that this concept be made operational, definitions of both resources and the poverty line are required. In addition, one needs some basis on which to compare families of different size and composition, for resources which may be adequate for some family types may be woefully inadequate for others. In most studies, resources are equated with current net money income, defined to include asset income but generally excluding income in kind. The poverty line itself has been conceived in alternative ways, the absolute, relative and official measures being most common. Absolute poverty corresponds to Watts' concept, being defined in terms of subsistence. Initially thought to provide the basis for an objective, scientific definition of poverty, it is now commonly accepted that this is not so and that value judgements are required on what constitutes 'necessary' and even 'minimum' consumption levels. Even so, the current official practice in the United States is to define the poverty line in terms of the income required to allow families on average to purchase a nutritionally adequate diet. This is derived from the cost of such a diet, given existing food prices, and the empirical observation that low income families spend about one third of their income on food.⁴ The relative concept of poverty views it as one extreme manifestation of income inequality; people are poor if their income is low relative to other incomes in the society to which they belong. Thus the poverty line can be expressed as some fraction of the mean or median income, as suggested for the United States by Fuchs (1967) for example. Finally the official poverty line is simply equal to the existing level of government income assistance payments; it is a method which has been used by Abel-Smith and Townsend (1965) and Atkinson (1969) to measure poverty in the United Kingdom. This method has the advantage that poverty is measured by the measuring rod of the government of the day; against this it produces the paradoxical result that measured poverty will be lower by definition under governments who set low assistance levels.

All three methods contain value judgements, and are to this extent arbitrary. Rather than rely on the values of the researcher, or the government, an alternative is to base the poverty line on the values and preferences of the members of society themselves. For it is they after all who will bear the brunt of any redistribution required to alleviate poverty. Townsend's research into individual conceptions of poverty indicated that many saw it in subsistence terms, but only a very small proportion saw poverty as a relative concept.⁵ A similar procedure has been suggested for Australia by Halladay (1975) and for the United States by Paglin (1980). In his paper Professor Kakwani considers the problems involved in making such an approach operational. The work of Goedhard et al. (1977) however, suggests some caution with such an approach. They report on a survey of over 2,800 Dutch families in which they were asked to state the minimum income which would just allow them to make ends meet. The stated minimum was found to depend both on family size and on actual family income. They went on to define the poverty line as the income at which actual and stated minimum incomes are equal, thus ensuring that the poverty line is independent of current income.

An alternative approach to the narrow economic definition of poverty has been proposed by Townsend (1979). He argues against defining poverty solely in income or consumption terms, and that

"... to concentrate on income as the sole criterion of poverty also implies that relatively simple adjustments, as might be made in a single scheme for negative income tax, will relieve it."⁶

In fact, however, on Townsend's plural approach,

"... the abolition of poverty may require comprehensive structural change in not one but several institutional systems."⁷

Townsend's concept of poverty is based on deprivation, reflected in 'style of living' rather than

consumption levels. Relative deprivation "denotes *feelings* of deprivation relative to others and not *conditions* of deprivation relative to others".⁸ He constructs an index of deprivation based on indicators of style of living including diet, clothing, housing facilities, conditions of work, health and social relations. A conventional poverty line in terms of income can be found by plotting the deprivation index against income and establishing for each family type the income at which the deprivation index increases disproportionately. But it is deprivation, not income per se which determines poverty. Low income is an indicator of poverty only indirectly through the established relationship between it and deprivation. On the basis of his index of relative deprivation, Townsend finds poverty in the United Kingdom in 1968-69 to be 25.2 per cent, compared to 7.1 per cent using the official poverty line.⁹

Both Watts and Townsend recognise that the income concept used needs to be defined broadly. In theory Watts argues that the appropriate concept is permanent income, which includes income flows from both human and non-human capital and gifts, whether in cash or kind. In practical terms this can be approximated by adding to current cash income the value of all income receipts in kinds, gifts, and the equivalent expected lifetime annuity value of all net wealth.¹⁰ Whilst the inclusion of private income in-kind, in the form of the imputed rent from home ownership or the value of homegrown food, is warranted, recent work in the United States by Smeeding (1977) and Paglin (1980) has argued that public income in-kind provided to low income groups should also be included in the income definition. This procedure, referred to as 'cashing out' the value of in-kind transfers to low income groups in the form of food, housing and medical programmes, has a substantial effect on the size of the poverty problem in the United States. In 1972 for example, the official Census estimate of poverty was 24.46 million people. Cashing out reduces this figure to 12.85 million according to Smeeding's calculations, and to 9.69 million according to Paglin.¹¹

In evaluating these results, four points should be borne in mind. Firstly, both Smeeding and Paglin base their estimates of poverty on the official poverty line. As indicated earlier however, this line is derived partly from observing the proportion of *total money income* spent on food by low income families. Since actual income is adjusted upwards by cashing out, consistency suggests that the poverty line should also be adjusted appropriately.¹² Secondly, there is considerable dispute as to the correct value at which in-kind transfers should be cashed out, and the results are sensitive to the method selected, as a comparison of Smeeding's and Paglin's results indicates. Thirdly, if one is to cash out the benefits from in-kind transfers, then account should also be taken of the taxes imposed to finance their provision. Both Smeeding and Paglin deduct personal income tax, but neither take account of indirect taxes which are well known to be regressive.¹³ Finally, why stop at cashing out for the low income groups only? If poverty is viewed in relative terms, then cashing out should be extended to all income groups. This is likely to affect the results considerably, and as Orshansky (1969), the originator of the United States' poverty line has argued:

"As for the argument that nonmoney income should be included in determining who is poor, one can say with confidence that inclusion of all the free medical care and the food stamps received by the poor and of all the benefits that go to the middle class, including health insurance benefits, expense accounts, vacations, free tuition, and commodity discounts would hardly change the result; nonmoney income, like income tax benefits, would go mainly to the nonpoor . . . and since poverty is relative, the poverty line would have to be moved up."¹⁴

If income definition and measurement is one problem common to all studies of poverty, another involves the estimation of family equivalence scales. These equivalence scales are the means by which the incomes of families of different type and composition are expressed on a common scale and thus compared. The scales are usually expressed in ratio form, relative to a standard

family. In what follows the standard family will be assumed to consist of a working man with dependent wife and two children. The equivalence scale for the standard family is given a value of unity, and those for other family types express the income they require, relative to the standard family, in order to attain the same standard of living. For example, if the equivalence scale for a four-child family is 1.4, this implies that such a family requires an income forty per cent higher than the standard family in order to achieve the same standard of living. It follows therefore that the poverty line for the four-child family should be forty per cent higher than that for the standard family. Equivalence scales are normally derived from the analysis of family expenditure patterns, although many different techniques are available for the calculation of the scales.¹⁵ The scales are clearly of great importance, for they not only determine the implied cost of additional family members,¹⁶ but also the overall extent of measured poverty and its composition by family type. Ideally, equivalence scales derived from alternative methods should be used to assess the sensitivity of poverty findings to the equivalence scales contained in the poverty lines.

The Measurement of Poverty by the Poverty Commission

Having briefly reviewed alternative theoretical approaches to poverty, income definition and equivalence scales, in this section the procedures adopted by the PC will be explained. In the Preface to their First Main Report, the PC recognised that poverty is both an economic condition and one which relates to the structure of society itself. Poverty is conceived of in relative terms, and attention is focused on the relationship of income to needs in assessing the extent of poverty. As in the previous section attention here will focus on three elements in their procedures: the definition of income, the poverty line for the standard family and the set of family equivalence scales.

The income concept used by the PC is defined as follows:

"Income consisted of the receipts (net of tax) of the head and wife in the form of earnings, pensions and benefits, superannuation, rent, scholarships, dividends, business income, etc. . . . child endowment and any income received by dependent children over 14 was taken into account. Tax refunds were considered when computing effective tax paid. Subsidies and income in kind, such as the pensioner medical service, reduced bus fares, etc., were excluded."¹⁷

Income units were defined as poor if their average weekly income of the previous year was below their respective poverty line. No attempt was made to include in income either in-kind receipts or the annuity value of net assets held. These omissions are likely to affect the results substantially in particular cases. For example, many farmers recorded as poor have additional resources in the form of homegrown food and own considerable assets.¹⁸

Allowance was made for the value of home ownership by calculating poverty both before and after housing costs. The former calculations used the income concept described above, whilst the after housing cost figures, which the PC regarded as "a most important indication of poverty"¹⁹ were calculated by deducting from income actual housing costs in the form of rent, mortgage repayments and land, water and sewerage rates, and comparing these figures with poverty lines which excluded the (estimated) housing component. These adjustments made a considerable difference to the extent of poverty amongst those groups owning their own home. In the case of the aged for example, where 61 per cent fully owned their own home, poverty declined from 23.8 per cent before housing to 7.6 per cent after housing costs.²⁰

The poverty lines used by the PC vary with the number, age, sex and workforce status of family members, as well as with their housing situation as described above. Once the poverty line for the

standard family has been established, those for other family types can be calculated from the family equivalence scales. The PC based the poverty line for the standard family on that used in the study of poverty in Melbourne undertaken by Henderson, Harcourt and Harper (1970). Thus it is informative to quote at length from this study:

"For our survey of income and needs . . . we have accepted as a state of poverty the situation of a man with a wife (not working) and two children where total weekly income . . . was less than the basic wage plus child endowment . . . We chose this basic wage concept of the poverty line because of its relevance to Australian concepts of living standards . . . This poverty line also has international relevance since, in relation to average earnings, to average incomes and to basic social service rates, it is comparable to the poverty lines that have been adopted in some surveys carried out overseas . . . We have deliberately confined ourselves to a study of poverty as determined by the relationship between the income of a family and its normal needs . . . We have not attempted to study the personal causes of poverty, its life cycle or its perpetuation, which would have taken us into the deep waters of the sociology of poverty . . . Finally we consider poverty to be a relative standard, to be defined in relationship to the living standards typical of the community in which we live."²¹

The poverty thus contains both relative and official elements. In line with the former, the PC updated the standard family poverty line by movements in seasonally adjusted average weekly earnings between the time of the Melbourne survey in 1966 and the Commission's work in 1973. This procedure implies that 'Australian concepts of living standards' were reflected in basic wage and child endowment levels up until 1966, but in average weekly earnings movements thereafter. If this process of adjustment is extended further, it produces a poverty line for the standard family of \$141.80 for the March quarter of 1980, based on average weekly earnings of \$250.90.

Table 1: Equivalence Scales Used by the Poverty Commission

Family Type	Points Allocated				Total	Equivalence Scale
	Adult Maintenance	Children's Maintenance	Housing	Fuel, Power, etc.		
Single Adult	20.80	—	12.1	4.9	37.80	0.529
Married Couple (MC)	29.70	—	13.1	6.7	49.50	0.693
MC and 1 child	29.70	8.48	14.5	8.0	60.68	0.850
MC and 2 children	29.70	16.71	15.7	9.3	71.41	1.000
MC and 3 children	29.70	25.19	16.9	10.6	82.39	1.154
MC and 4 children	29.70	33.42	18.2	11.8	93.12	1.304
MC and 5 children	29.70	41.90	19.4	12.6	103.60	1.451
MC and 6 children	29.70	50.13	20.0	14.0	113.83	1.594
Single Parent and 2 children	19.70	16.71	14.5	8.0	58.91	0.825
Single Parent and 4 children	19.70	33.42	16.9	10.6	70.02	0.981

Notes: (i) In order to standardise for the age, sex and workforce status of family members, it has been assumed that all adults are aged under 40, all children are aged between 6 and 15 and of alternate sex beginning male, the first adult in each family is male and in the workforce and the second adult is female and not in the workforce.

(ii) The equivalence scales are derived by dividing the total points score by the total score for the standard family.

At the time of the work of the PC, the family expenditure data required to estimate family equivalence scales were not available, and so scales produced by the Budget Service Standard of New York in 1954 were used. These scales are clearly only appropriate if the expenditure patterns of New York families in 1954 and of Australian families in 1973 are similar, an unlikely situation as Sebel (1976) has pointed out. The scales themselves are built up by allocating points to various items of family expenditure, relating to the maintenance of family members in the form of food, clothing, recreation, transport, etc., to housing and to fuel, power, furniture, furnishings, etc. The equivalence scales and their component parts are shown in Table 1 for a range of family types. Translating the equivalence scales into monetary values, the poverty line for the standard family in March 1980 is \$141.80 per week, comprising \$59.00 for maintenance of adult members, \$33.20 for children, \$31.20 for housing and \$18.50 for fuel and power.²² For a married couple with six children the poverty line in March 1980 is \$226.00, comprising \$59.00 for the maintenance of adults, \$99.50 for children, \$39.70 for housing and \$27.80 for fuel and power. Despite the fact that, holding age constant, maintenance costs per adult and per child remain constant, economies of scale of family size are implied, due to the lower maintenance costs of children and because of the housing and fuel and power costs. On the basis of the above figures, the allowance for housing appears quite low, particularly for low income families in the private rentals market of the capital cities.

The PC recognised the shortcomings inherent in its use of the New York equivalence scales and recommended "that further inquiry be instituted to derive a set of relative rates appropriate to Australian conditions."²³ In this regard, it is worth pointing out that equivalence scales for Australian families have been estimated from Australian data by both Podder (1971) and Kakwani (1977). The methods used in the two studies differ considerably, although the data is the same. The resulting scales are compared with those used by the PC in Table 2. It is apparent

Table 2: Estimated Equivalence Scales for Australia

Family Type	Equivalence Scales		
	Poverty Commission (1973)	Podder (1966/68)	Kakwani (1966/67)
Single Adult	0.529	0.329	0.438
Married Couple (MC)	0.693	0.675	0.725
MC and one child	0.850	0.844	0.877
MC and 2 children	1.000	1.000	1.000
MC and 3 children	1.154	1.131	1.075
MC and 4 children	1.304	1.332	1.114
MC and 5 children	1.451	1.608	1.151
MC and 6 children	1.594	1.845	1.187

Sources: Column 1: Table 1 above
Column 2: Podder (1971), Table 1, p.185
Column 3: Kakwani (1977), Table 2, p.509

that the three sets of equivalence scales differ considerably, particularly for single adults and large families. Given that Podder and Kakwani derive their scales from the same data, it is also apparent that the scales are sensitive to the methods used to derive them. The scales used by the PC are quite close to those produced for the United Kingdom by McClements (1978), and, as Professor Henderson (1980) has recently pointed out, they are close to those produced by Townsend's relative deprivation approach. However, these similarities seem less comforting than the differences indicated in Table 2.

Within the context of alternative conceptual approaches to poverty, it is apparent that the poverty lines used by the PC are open to criticism on several counts. Of these, the more important appear to be the selection of the poverty line in 1973 for the standard family, the method used to update the poverty line over time, the set of family equivalence scales used to derive the poverty lines for other family types and the definition of income used to measure the extent of poverty. At the empirical level, interest focuses on whether these factors are important determinants of the size and composition of the poor. It is conceivable that adjustments in each of these regards offset each other, or that the poor are such a clearly delineated group that alternative poverty lines identify the same groups in poverty. It seems more likely however, that the poor represent one extreme of a continuum of income and deprivation, in which case the elements which go into the construction of the poverty line become crucial.

The Seminar: Summary and Appraisal

In addition to the three papers which follow, the seminar also contained an opening address by Professor Martin Rein and an introduction to the general discussion by Philippa Smith, Policy Officer of the Australian Council of Social Service. In his opening remarks, Professor Rein began by contrasting the absolute, relative and subjective approaches to the poverty line. The subjective approach is based on conceptions of poverty held by members of society, as reported in survey responses; the absolute and relative approaches have been described above. Tension exists between these three, particularly the latter two, a tension not confronted by Townsend (1979) in his recently published work. (When asked for their conceptions of poverty, 31 per cent of the sample replied that they viewed poverty in subsistence terms, 29 per cent viewed it in terms of minority groups with a high risk of poverty and only 2 per cent viewed poverty relative to others.)

This suggests that a number of alternative poverty lines should be developed, rather than searching for a single line appropriate for all circumstances at all times. Indeed, a number of implicit poverty thresholds already exist, a price threshold defined in terms of the cost of a basket of essential goods and services, a tax threshold at which liability for personal income tax begins, and a benefit threshold equal to government income assistance levels.

Turning to the definition of income as it applies to the measurement of poverty, Professor Rein summarised the recent controversy in the United States over the cashing out of public transfers in-kind to the poor. Three aspects of this debate deserve particular attention: the range of goods and services to be cashed out, the valuations used when cashing out, and the sections of the population for whom cashing out should take place. He argued that cashing out should be applied to all income groups, not just the poor, and that the range of goods and services included should be defined to include both private and public transfers in kind. Severe conceptual problems arise in some cases, education for example, where the benefits take the form of an increase in future earnings capacity rather than a supplement to current income. He noted also the valuation problems associated with transfers in-kind, where the convention has been to value them below the cost of their provision, on the grounds that this compensates for the fact that the recipients have no choice over the form in which to spend the resources corresponding to the transfers they receive. However, this leaves open the question of what is to be done with the residual cost component. Can it simply be ignored as a deadweight loss, or should some account be taken of it as it is a real cost in the sense that it places real burdens on taxation revenue.

Professor Kakwani's paper considers two major issues: the problem of establishing a poverty line and, given this, the construction of alternative poverty indices. With regard to the former problem, he proposes a method whereby a subjective poverty line could be established by weighing the value judgements of individuals in society. These value judgements are obtained by asking people for their preferences, in probability terms, for a range of poverty lines from subsistence up

to the mean or median income in society. He shows that under certain conditions the social probability for a particular poverty line is simply the average of all individual probabilities, and that the poverty line overall can then be expressed as an average of all particular poverty lines, weighted by their respective social probability.

He then goes on to develop a class of poverty measures which take account not only of the number of individuals or families below the poverty line (the head-count ratio), nor simply the total poverty line income shortfall of the poor (the poverty gap or deficit), but also the inequality of incomes amongst the poor themselves. Neither the head-count ratio nor the poverty deficit is sensitive to income transfers among the poor, and to this extent are deficient. For example, a transfer of income from the poorest individual to someone else who is also poor, but less so, should be reflected by an increase in the poverty index. He defines a generalised poverty index as the product of the head-count ratio and the income gap ratio, defined as the proportional difference between the poverty line and the income which, if distributed equally among the poor, would give them as a group the same level of social welfare as their current distribution of income. The index is equal to zero when all the poor receive the poverty line income, and is equal to the head-count ratio when all the poor have zero income. In general it increases, indicating a greater degree of poverty, if the mean income of the poor declines, or if income inequality amongst the poor increases for a given mean income. Kakwani compares this index with a number of alternatives proposed recently, particularly those based on the approach suggested by Sen (1976). Finally he applies the index to measure and compare the extent of poverty in 31 developing countries.

Patricia Tulloch was concerned in her paper with the sociological shortcomings of the poverty line with reference to the research of Townsend and the Australian Poverty Commission. She argues that conflict exists between the complexities implied by a full understanding of poverty and the administrative and political requirements for a simple, flexible poverty line. Recognition of such conflict prompted Townsend to express his relative deprivation poverty index in income terms. In order to influence policy, she argues that poverty research must establish credibility, but that this is difficult if not impossible given its inherent contradictions. In particular, she stresses that the principles of validity, externality and value-freedom are mutually unattainable. Poverty research necessarily involves value judgements; 'facts' are determined by 'values' not vice versa, which means that to establish the separate existence of the 'real phenomena' of poverty (validity) and to provide objective, quantifiable measures of aspects of poverty (externality) will never be successful. Social inquiry should instead focus on the wider questions of the measurement and justification of existing inequalities, of which poverty and affluence are the extremes. Given the lack of social consensus on the desired degree of inequality, and in the face of powerful countervailing interests protecting the status quo, the potential for poverty research to be translated into policy is even less likely. It is action that the poor need, not more research nor a technically improved poverty line.

In the paper by Jim Cox, he first details the Ministerial statements which lead to the request to the Social Welfare Policy Secretariat to investigate the issue of the poverty line. He then sets out an initial research agenda for the Secretariat, emphasising the kind of information they wish to collect and the kind of questions they wish to answer. He identifies four kinds of information which would be useful for policy makers: (i) what does the community regard as a poverty standard of living; (ii) what sort of families currently fail to reach this standard; (iii) what is the appropriate income definition against which poverty should be assessed; and (iv) what is an appropriate set of family equivalence scales? In trying to answer these questions, the Secretariat recognises that any single poverty line will contain value judgements and is to this extent arbitrary. It thus intends to pursue a number of approaches and, after sampling the opinions of experts and other interested parties, hopes to produce a number of alternative poverty lines. In the initial stages of their work, then intend to limit themselves to the use of data already

collected, in order to assess the likely value of research based on the collection and analysis of new data. Finally, he outlines the problems he saw in the estimation of family equivalence scales, and proposed two methods which the Secretariat hopes to develop in order to produce a new set of equivalence scales for Australia.

In her introduction to general discussion, Philippa Smith began by welcoming further examination of the poverty line, but expressed the hope that this would not destroy the notion of a benchmark for setting minimum targets. She hoped that the outcome of this process would not be no poverty line at all, but possibly several alternative lines or standards. She saw the poverty standard as useful in setting expenditure priorities, in assessing policy effectiveness and allowing demands for resources to be couched in terms of needs and minimum standards. Poverty is essentially a relative phenomenon, and the poverty line should therefore reflect society's standards as to what is normal and essential. On the question of a subjective poverty line, she quoted the results of a survey published in the March 1980 issue of *The Bulletin*. A Morgan Gallup Poll of the income regarded by people as the minimum necessary for a family of four, produced a figure of \$206.00 per week, significantly higher than the current poverty line of \$137.60 per week for a family of four in March 1980.

She emphasised that certain groups currently dependent on pensions or benefits receive assistance at levels below the Commission's poverty line. The worst off groups are those with dependent children and lone parents, as a result of the failure to increase the child dependent's allowance since 1975 and the guardian's allowance since 1969. Relativities currently seem rather strange, when a lone parent with two children receives roughly the same as a married pensioner couple. Other deficiencies she saw currently include the inadequate supplementary rent allowance, not increased from \$5.00 per week since 1974, and the position of the unemployed generally, but particularly those aged under 18. She pointed out that the housing component of the current poverty line is very low and this in particular needs further investigation.

As a result of these deficiencies, many groups are currently experiencing difficulty in coping, as evidenced by the findings of the study of emergency relief conducted jointly by ACOSS and the Department of Social Security. This indicated that 89 per cent of clients were below the poverty line and 75 per cent were in receipt of pension or benefit. The results of a recent study in Newcastle questions the assumption that the unemployed aged under 18 live at home, often used to justify their low benefit levels. Spot checks indicated that 30 per cent are not living at home, and more shouldn't be, given the mounting tension in many cases. There is thus already clear evidence that urgent action is required for those in poverty and at risk. It would be tragic if the review of the poverty line was allowed to further postpone action in these areas.

The discussions which took place throughout the seminar were extremely wide ranging, containing a diversity of viewpoints. In summarising them, I have grouped them into the following five main areas:

(i) The need for more research: It was argued strongly by some participants that we do not need more research into the poverty line, that such research would be used as a substitute for policies needed now to assist the poor. How can we be sure that such research will produce action, when a little action followed the extensive research efforts of the Poverty Commission itself during 1972-75? Against this, it was pointed out that substantial changes had taken place during and since the mid-seventies, many of them of a fundamental structural nature, and this helped to explain the reluctance of policy makers to respond to all of the recommendations of the Commission. Even apparently straightforward changes, such as the adjustment of pension and benefit levels to the poverty line now in existence, imply an acceptance of this line which is by no means universal. Furthermore, since some pension and benefit levels are currently above the poverty line, should these be reduced?

(ii) Is the concept of a poverty line useful? Many people argued that the poverty line was a useful benchmark against which actual and proposed policies could be evaluated. This is particularly true for the analysis of guaranteed minimum income schemes of the type proposed by the PC, in which the minimum income payments are expressed in terms of the poverty line, but it was also of value in appraising redistributive policy in general. Furthermore, in comparing poverty over time, the methods used to update the poverty line are crucial and most people expressed dissatisfaction with the existing practice of updating the poverty line by movements in pre-tax average weekly earnings. It was pointed out that on a relative conception of poverty, the poverty line should fall in real terms if negative growth was experienced in the economy, as has occurred recently in some economies. This will not necessarily arise if the poverty line also contains a subsistence element, an absolute floor below which the poverty line should not fall.

(iii) Equivalence Scales: There was considerable discussion on the derivation of equivalence scales and general agreement that more research was needed in this area. The importance of this was highlighted by Professor Kakwani, who pointed out that on the basis of his research, the conclusion of the PC that large families had a high risk of poverty was not borne out. Using his own equivalence scales (shown in Table 2), he found the incidence of poverty to be much greater among families consisting of a single adult only. In reviewing alternative techniques, it was argued that the use of the proportion of expenditure on a given basket of commodities (food, for example) as an indicator of standard of living took no account of changes in relative prices. The utility approach was better in this regard but suffered from problems of its own, notably in assuming that the utility function does not change with family size or composition, and in the failure to recognise that having children is itself a choice variable which contributes directly to family utility. In addition, the approach begs the question of the distribution of utility among individual family members. A representative of the Australian Bureau of Statistics engaged in assisting the Social Welfare Policy Secretariat in their research on this issue, indicated that considerable problems had been encountered in their work based on the utility approach, and they now doubted its value. It was argued that measuring standards of living by proportional expenditure on a basket of commodities was reasonable when working in terms of averages, as one inevitably is when discussing the poverty line. Overall, one could do no more at this stage than try a number of alternative techniques and assess how sensitive the equivalence scales are to the methods used to derive them.

(iv) The survey approach to the development of a subjective poverty line: This idea prompted a good deal of interest and discussion. It was argued that such a survey could not be restricted just to the poor, since this would involve a circularity which begs the question of the definition of the poor in the first place. The sample would need to be a random selection from the whole population although it was not clear how their responses would be aggregated, particularly if there was no consensus in the replies. Several people pointed out that this approach assumes that there exists a 'public opinion' which the researcher can tap at will, but this may not be the case. Townsend warns against the use of public opinion, on the grounds that it often embodies and encapsulates the status quo, leading inevitably to an unduly conservative approach. It was agreed that the precise wording of the questions to be asked is crucial, as is an indication to those sampled of whether or not their views are to be taken into account by the policy maker. Finally, it might be desirable to widen the scope of such surveys, to include questions on public attitudes not only to minimum, but also to comfortable and affluent standards of living. If undertaken with care, these surveys might produce estimates of socially acceptable minimum living standards which could replace conceptions currently implicit in welfare, as well as legal, medical and arbitration practices in Australia. As Professor Rein pointed out, the methodology of such research has already been established by Rainwater (1974) in his work in the United States.

(v) Conflicts in research and policy: It was generally agreed that the conflicts in this area are varied and numerous. At the theoretical level there are alternative conceptual approaches to the

poverty problem, and alternative paradigms within which data can be collected and analysed. The researcher, in investigating the nature and causes of poverty, often by necessity adopts a critical approach to the existing social order, which conflicts with the more conservative demands for advice from policy makers. The public servant often lies at the centre of this conflict as the Social Welfare Policy Secretariat are undoubtedly aware in the current context, trying to resolve the conflicting demands placed on them by academics on the one hand, and by politicians on the other. The poverty line is of great economic, social and political significance, but it must remain doubtful whether a single poverty line can ever satisfy the demands of the researcher, the politician, the administrator, the population at large and, most importantly, the poor themselves. Nevertheless, it was felt by most participants that further investigation into the poverty line in Australia is worthwhile, and it is encouraging to see the government, through the Social Welfare Policy Secretariat, actively seeking advice and opinion in the course of its deliberations.

Footnotes

1. Australia — Commission of Inquiry into Poverty, *Poverty in Australia* — Canberra: AGPS, 1975.
2. Watts' original paper was published in 1968, but the 1977 version contains an additional introduction which summarises the issues.
3. Watts, 1977, p.20.
4. For a critical appraisal of the methods used, see Rein (1970).
5. Townsend, 1979, Table 6.1, p.240.
6. Townsend, op.cit., p.240.
7. Townsend, op. cit., p.240.
8. Townsend, op. cit., pp.47-48; italics in the original.
9. Townsend, op. cit., Table 7.1, p.273.
10. Weisbrod and Hansen (1968) have measured poverty in the United States after adjusting income by expected lifetime annuity values of assets. They found poverty in 1962 declined from 20 per cent to between 17 and 18 per cent, depending on the assumed rate of interest. For an attempt to adjust earnings in line with the permanent income concept, and its implications for the measurement of poverty, see Garfinkel and Haveman (1977).
11. The reductions are not solely due to cashing out; Smeeding reduces the official figures by 5.66 million, and Paglin by 4.20 million after allowing for underreporting of income, the influence of income tax and conversion from a family to a household unit.
12. Consider the following illustrative example: Let the cost of the nutritionally adequate diet be \$M per week, and let \$E be the weekly expenditure on food by low income families, whose weekly income is \$Y. Then the conventional poverty line (P) is given by $P = M.Y/E$. If the value of in-kind transfers through cashing out is \$K for these families, then the proportion of total income spent on food falls from E/Y to $E/(Y+K)$. Thus the poverty line increases to a new value (P*) given by $P^* = M.(Y+K)/E$. Thus it follows that $P^* = P.(1+K/Y)$, i.e. the post-cashing out poverty line is (K/Y) per cent above the original poverty line, this proportion being equal to the proportion of in-kind to money income.
13. Evidence for Australia is presented by Bentley, Collins and Drane (1974) and Podder and Kakwani (1975).
14. Orshansky, 1969, p.39.
15. For a review of alternative methods, see Nicholson (1976) and Fiegehen, Lansley and Smith (1977), Chapter 7.
16. This point is considered in more detail in Saunders (1980).

17. *Poverty in Australia*, Volume 1, p.12, footnote 2.
18. Some evidence on asset holding by farmers is given in *Poverty In Australia*, Volume 2, Appendix 9.
19. *Poverty in Australia*, Volume 1, p.15.
20. *Poverty in Australia*, Volume 1, Tables 14.3, p.240.
21. Henderson, Harcourt and Harper (1970), pp.1-2.
22. Numbers do not add up due to rounding.
23. *Poverty in Australia*, Volume 1, p.42.

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The Poverty Line: Problems of Theory and Application by Patricia Tulloch

Introduction

Poverty research has served academics better than the poor — the failure to eliminate poverty remains a standard characteristic of affluent societies. In this paper the interrelationship of capitalism and poverty is taken for granted, and within that context, the factors which limit the influence of poverty research are examined. The factors reviewed are the sociological shortcomings of the "poverty line" concept, difficulties of establishing validity and objectivity, and questions of feasibility and public acceptance. These issues are considered with particular reference to Townsend's recent study of poverty in the United Kingdom¹ and the Australian Poverty Commission.²

The distinction between absolute and relative approaches is well known. The former includes both subsistence measures and arbitrary definitions derived from national minima. While the Australian poverty line is updated in relation to average weekly earnings, its basic rationale (minimum wage plus child endowment) is that of the arbitrary approach. It can be compared with Townsend's third, essentially relative, measure of poverty — the deprivation standard.

The deprivation standard was defined as "a standard of income below which people experience deprivation disproportionately to income".³ According to this measure 23 per cent of people (25 per cent of households) were found to be in poverty. The other standards gave more conservative estimates. By the state's standard (basic supplementary benefit plus housing costs) six per cent of people were described as poor, and 22 per cent on the margins of poverty. Nine per cent of people were classified as poor under the relative income standard (50 per cent of mean income for a number of different household types).⁴ Townsend considered that only the deprivation standard could provide an objective and consistent measure of poverty.

The approach was multi-factorial and based on national expectations and practices. People were described as poor when they "lacked the resources to obtain the types of diet, participate in the activities and have the living conditions which are customary, or at least widely encouraged, in the societies to which they belong".⁵ Sixty indicators of the national style of living were drawn up including diet, clothing, fuel and light, housing, home amenities and environment, conditions at work, family support, recreation, education, health, and social relations.⁶ These multiple indices of deprivation were collapsed into a poverty line with the hypothesis that:

"In descending the income scale . . . at a particular point for different types of family, a significantly large number of families reduce more than proportionately in the community's style of living. They drop out or are excluded. These income points can be identified as the poverty line."⁷

A poverty line based on multiple indices of deprivation seems distant from Rowntree's idea of subsistence poverty which Townsend first criticised in 1954,⁸ — or from the basically arbitrary definition of the Australian Poverty Commission. Sociologically, it is more comprehensive, more satisfying, more generous. Its political implications are far more radical: absolute poverty can be eliminated by economic progress, relative disadvantage only by revolutionary change. "If poverty is absolute hardship", says Donnison, "we can put an end to it by raising the living standards of the nation until even the poorest have enough to eat, but without making any change in the distribution of resources among different groups within the country. But if poverty is relative disadvantage . . . then we can put an end to it only by creating a more equal society."⁹

I shall argue, however, that most so-called 'absolute' definitions involve some notion of relativity and therefore a demand — however modest — for redistribution. The difference between the two approaches is one of degree. To a greater or lesser extent most poverty research challenges the status-quo. Within this context there arise problems of theory and application which restrict the potential influence of even the more conservative kinds of research. These include:

- (i) The tension between the need for a full, social understanding of poverty and the administrative requirements for a simple, flexible, poverty line.
- (ii) The problem of establishing the credibility needed to influence policy decisions and, in particular, of meeting the interlocking requirements of validity, externality, and value-freedom.
- (iii) Considerations of feasibility and political constraints.

(i) Sociological understanding and policy application

All efforts to identify and measure poverty are designed to influence public policy. Some researchers, notably Townsend, also try to provide a sociological analysis of inequality. "We were trying to sustain" he says, "both an account of the total social structure (as well as of the relationship between its components parts) and an account of poor minorities within that structure."¹⁰ It is in this context — practicality versus sociological critique — that many of the difficulties and subsequent criticisms of poverty lines emerge.

The Canadian Senate Committee argued that a poverty line had to be "easily understood, easily calculated, and easily revised on a yearly basis".¹¹ A poverty line which meets the policy, or administrative, requirements of simplicity and flexibility is bound to obscure the social complexity of poverty — and vice versa. Policy needs quantifiable, concrete criteria — the qualitative nature of deprivation cannot appear in official statistics. Suffering is camouflaged by technical data, hiding the poverty which means "hearing the babies cry because they are hungry or cold".¹²

The breadth and depth of Townsend's research provides a massive amount of sociological data — on wealth as well as poverty, lifestyles, work, housing, area poverty, and disadvantaged groups. Its sociological influence, however, is likely to be greater than its policy implications. First, because the implications of his finding that 23 per cent of the population were poor according to the relative deprivation standard¹³ are too radical to have any substantial influence in Britain today. Further, having argued that there is "an inbuilt tension, and even contradiction, in the application of the principle of a national income to a market economy",¹⁴ he provides as Atkinson says "only a brief sketch of the transformation in economic organisation that would be necessary to deal with the problems which he has identified so clearly".¹⁵

Townsend's emphasis is on sociological critique rather than immediate policy change. It is, though, a matter of emphasis. For his attempt to construct a poverty line based on the *level of income* at which deprivation and non-participation increase disproportionately, was an attempt to produce an administratively manageable artefact. Townsend's approach, though, differs from traditional income-based measures such as that employed by the Australian Poverty Commission. His poverty line marks the level at which multiple deprivations *demonstrably* occur; the Australian poverty line identifies an income level *assumedly* linked with narrower deprivations. In the first case income is an index of the wider meaning and consequences of poverty, the second approach risks defining poverty in terms of low income.

It is arguable that Townsend, in demonstrating an association between income and multiple

deprivation, has partially vindicated the Australian Poverty Commission (and others) who have implicitly assumed that income-based measures will identify groups suffering multiple disadvantages, and lead to more widely based change. Henderson argued that "socio-economic status, power and social norms are so closely inter-related that significant change in one area must be accompanied by changes in others".¹⁶ Townsend disagrees:

"To concentrate on cash income is to ignore the subtle ways developed in both modern and traditional societies for conferring and distributing benefits. Moreover, to concentrate on income as the sole criterion of poverty also implies that relatively simple adjustments, as might be made in a single scheme for negative income tax will relieve it."¹⁷

He argues that the abolition of poverty requires "comprehensive structural change in not one but several institutional systems".¹⁸ The point is indisputable — and one with which people in both Britain and Australia have still to come to terms.

Townsend's plural approach is a prerequisite for a full understanding of poverty and for comprehensive change. The complexity of the method, though, presents real administrative problems. Further, the attempt to collapse multiple deprivation into a single income-based poverty line was only partially successful. The population is not "cleanly divided into the deprived and non-deprived", and Townsend concluded that it was unlikely that "any simple or consistently direct relationship between income and deprivation" could be established".¹⁹

The problem is more fundamental than the technical difficulty of absorbing social complexity into a poverty line. Any far reaching and comprehensive social inquiry will, by its nature, reveal the magnitude of institutional change needed to eliminate poverty. The political will for such change is absent.

(ii) Validity, Externality and Ideology

If research is to influence policy it must be seen to produce valid and objective information. In the effort to satisfy these principles poverty research has become devoted to positivist demands at the expense of the explicit examination of ideological issues.

The principle of validity requires that the definition of poverty demonstrates a difference in kind as opposed to degree, between the poor and the rest. Poverty is 'something different', more than just another dimension of inequality. Like disease it must appear to be a 'real phenomenon', its attributes to exist in concrete reality — and not in the eye of the beholder.

The idea of an 'objective' definition of poverty involves the principles of (a) externality and (b) value-freedom. (Positivists assume that the two are inseparable.) The principle of externality ascribes objectivity to research which investigates the actual, external, or measurable aspects of poverty. It is seen as the obverse of a subjective or phenomenological approach which investigates qualitative, usually immeasurable, characteristics. (The corresponding difference in the researcher's role has been widely discussed in a more general context²⁰ and is not pursued here.)

The principle of value-freedom demands an impartial definition seen to be independent of the researcher's values and perceptions of social justice. The credibility of poverty research is easily undermined by accusations of subjectivity and bias. While the possibility of value-free research is not officially a reputable academic belief, the aim remains influential and should therefore be taken seriously.

I believe that these principles are — as a group — unattainable. The distinction between the 'poor'

and the 'rest' is difficult to sustain (the question of validity). In reality, poverty definitions relate to different dimensions of inequality, and while we may agree that different levels of deprivation each involve 'real' consequences (the question of externality) we disagree about which deserves the poverty label (a question of ideology). The arguments behind these conclusions are now given.

(a) *Validity*

The belief that a real, qualitative, distinction can be made between the poor and the non-poor is immediately confronted, and contradicted, by the existence of wide disagreement about the nature of poverty. The credibility of the 'real phenomenon' view is undermined by the elusiveness of the concept.

At first glance absolute definitions of poverty – which presumably refer to some identifiable distinction determined by basic needs – appear to offer a clear case. They are most convincing in the poorest countries where poverty has the sharpest results. Subsistence definitions then reflect life and death, starvation and homelessness. The consequences of poverty are stark, clear-cut, and identifiable. But once we advance beyond a subsistence economy the distinctions are much less obvious. At this stage, most so-called absolute definitions, whether overtly or not, embody some idea of relativity – a departure from the universal and identifiable concept of subsistence. Relationships to prevailing standards and practices determined the level of the poverty line in the work of Orshansky²¹ and the Canadian Senate Committee²² where actual consumption patterns were taken into account. Arbitrary measures of poverty reflect the relativity embodied in national scales of need. Historically, at least, the Australian minimum wage was supposed to cover the "normal needs of an average employee regarded as a human being living in a civilised community".²³ All such definitions represent, as Townsend says, "rather narrow conceptions of relative deprivation and deserve to be clarified as such".²⁴

The characteristics of poverty thus lose universal applicability. The relative 'poverty' of a person living just above subsistence level in an impoverished society, and of his counterpart, far richer in real terms, but unable to participate in an affluent society, becomes problematic. Resolving this dilemma by reference to global standards is unsatisfactory, for world standards are too distant to exert the kind of social pressure inherent to relative deprivation theory. Townsend's solution is to argue that while the manifestations of poverty may vary, the social meaning of the concept remains consistent. The idea of exclusion from ordinary living patterns, customs, and activities is constant, its manifestations relative. The argument is possible, but a number of problems remain.

In the first place, the idea of 'average standards', and its implications for poverty, is very different in countries with a narrow, than in those with a wide, dispersion of income and wealth. Paradoxically, poverty becomes more difficult to identify as the distance between the 'two nations' widens; when impoverishment and wealth co-exist the middle equation of average standards may be absent or artificial.

We can also question whether almost a quarter of the British population are, in fact, united by a common denominator called poverty. Do those at the top of the poverty hierarchy identify more with those at the bottom, or with the more average members of society? The question remains an open one, and different sociologists reach different conclusions. Roe has suggested that the Australian poor are an increasingly isolated and permanent class, deserted by their traditional allies who are "upward borne, hard pressed, and deeply committed to consolidation".²⁵ A difference of social structure or sociological interpretation?

It seems difficult, if not impossible, to give priority to a particular definition on factual grounds. Egalitarians perceive people as poor when they can't participate, conservatives when they can't

eat. I hold the first view, but no amount of research will 'prove' my case. Conviction belongs to ideology and is not intrinsic to the data. Yet the principle of externality, to which we now turn, reinforces the opposite supposition.

(b) *Externality*

The factual, or objective criteria adopted in absolute definitions are sometimes compared favourably, in this context, with the infinite subjectivity associated with the relative school. The lack of precision involved in 'scientific' definitions of nutritional need is, however, widely recognised, and we have already noticed the relative element of such approaches.

The idea that relativity necessarily means subjectivity derives from the dominant sociological use of the term 'relative deprivation'. Coined originally by Stouffer²⁶ and elaborated by Merton²⁷ and Runciman²⁸ it was used to denote the *feelings* and not *conditions* of deprivation relative to others. The combination of relativity and subjectivity presents a potentially unmanageable problem for the politics and sociology of poverty as Pinker points out — "relativity is a game which everyone has a right to play. The right to claim consideration of his subjective definition of needs is available to the marginally affluent as well as the marginally poor person".²⁹ And more recently Seabrook, rather eloquently, makes the same point. "... the idea of poverty does not only afflict the poorest. It is a spectre invoked by every section and at every level of society. Even the most favoured feel that their resources are spirited away before they can realise their most cherished life-plans ... we are all poor nowadays."³⁰

Townsend distinguishes, however, between (a) objective deprivation, (b) conventionally acknowledged deprivation, and (c) individual subjective deprivation.³¹ While recognising that all three combine to explain social reality he focusses on the relative *conditions*, not perceptions, of poverty. He argues that "differences in conditions between men underlie social structure and values"³² and that "all too often the social scientist can be the unwitting servant of contemporary social values ... in the study of poverty this can have disastrous social consequences".³³ (Over a third of Townsend's sample did not, in fact, believe there was such a thing as real poverty and this belief was more prevalent among the poorest. Further, poverty was most frequently described in subsistence or minority group terms.³⁴) Objectivity for Townsend was therefore to be achieved through examination of the actual conditions of deprivation and their relationship with the national style of living.

Although an analytical distinction can be made between actual conditions and the way in which they are subjectively experienced, the idea of 'externality' is problematic. The conditions chosen to identify poverty are, in reality, independent of neither social reactions nor of the values of the researcher. The relationship with social reactions is inherent to the idea of relative deprivation which is essentially a subjective and socio-psychological construct. Why does non-participation matter? Why should we consider people poor when they are excluded from a life-style which the rest of us enjoy? Presumably because we recognise that exclusion hurts. The idea of non-participation is powerful *because* of its subjective implications — it is not the facts, but their social and individual consequences, that matter. 'Externality' does not override subjectivity, but meets it half-way, introducing an element of standardisation and fairness.

The subjective force of the idea of poverty as non-participation is only one reason for its choice. The other is the ideological belief (of the researcher) that all people, whether they recognise it or not, have a *right* or participate in the life-style of their country. It is to the value issue which we now turn.

(c) *Value Freedom*

Townsend admits that his approach is not value-free, but maintains that "at least they (values) will have been pushed one or two further stages back", since the deprivation standard depends more on "externally instead of subjectively assessed criteria".³⁵ I am suggesting, though, that externality is not coterminous with value-freedom, and that one does not necessarily lead to the other. Actual, or external, conditions can (theoretically) be selected to justify any poverty line. The empirical data is merely used to rationalise, or justify, *prior* value choices about the meaning of poverty, its dimensions, and its relationship to wider socio-economic inequality.

The initial decision to use subsistence, arbitrary, or relative standards is itself a value decision. In each case the researcher makes a prior decision about the meaning of need, and superimposes his own value preferences on the data. The imprecision and relativity of "normative need"³⁶ is overlaid by ideology. With Rein, it must be re-emphasised that "values, preferences, and political realities influence the definition of subsistence".³⁷ Similarly with comparative standards. The social scientist makes his own decisions about appropriate reference groups or bases of comparison, his own assessment of what such standards are, his own choice of indicators.

The 'real phenomenon' view of poverty is difficult to support. It is not the 'facts' which determine the value position, but the other way round. Poverty is a label which the researcher, for moral, emotive, and political reasons, applies to a particular level of inequality. It is essentially a value judgement, expressing preferences about social change and the shape and nature of society. In Orshansky's words:

"Poverty like beauty is in the eye of the beholder. Poverty is a value judgement; it is not something which one can verify or demonstrate."³⁸

If poverty is an ideological issue, what is the role of social science? Is it merely to identify deprived groups, providing a social map of a particular form of inequality? Myrdal suggests that more is possible, arguing that social science, by clarifying empirically based beliefs, can lead to value modification;

"By increasing true knowledge and purging . . . false beliefs . . . social science lays the groundwork for a more effective education: making people's beliefs more rational, forcing valuations out into the open and making it more difficult to retain valuations on the lower level opposing those on the higher level . . ."³⁹

The argument suggests that research demonstrating the extent and severity of deprivation could, for example, modify values in favour of equality. There are several problems with this proposition. First, as Myrdal himself so clearly argued, the researcher seldom makes explicit the relationship between fact and value. Ideological issues are hidden behind a mass of hard data, and the sceptical can ignore the moral merits of the case.⁴⁰ Secondly, the ideological heterogeneity of poverty research is not resolved by factual analysis. In Rein's terms, "objective evidence does not permit us to choose between competing ideologies or frameworks of thought"⁴¹ and "the crucial issues in a policy debate are not so much matters of fact as questions of interpretation".⁴² Finally, the idea that knowledge of the truth "shall make us free" ignores the force of political and social constraints to change. It is this last issue which is ultimately responsible for the general failure to eliminate even absolute poverty and hardship from affluent societies. Poverty is an integral part of our ideology and practices: wars which can't be won have been waged; the idea and the evidence of poverty will remain with us. We turn, finally, to the questions of change, feasibility, and constraint.

(iii) Change, Feasibility and Constraint

Poverty definitions form a continuum in which the extent of inequality seen as acceptable steadily diminishes. The more conservative the proposal, the smaller the challenge to the status-quo, the greater the chance of implementation.

Absolute definitions suggest a containable problem which can be solved without major structural change. Their austerity is designed to convince the sceptical, and is related rather closely to the amount of change felt to be feasible or desirable. The Australian Poverty Commission clearly followed this tradition saying that "it cannot seriously be argued that those below this austere line, whom we have described as 'very poor' are not so".⁴³ The aim was to achieve action for the poorest members of society not to substantially change or widen perceptions of social inequality.

Townsend's definition stems from a socialist philosophy and the commensurate desire to see widespread change. He writes about "distributional justice for all", saying that an "effective assault" on poverty would demand the abolition of excessive wealth and income; the introduction of an equitable income structure; the abolition of unemployment; and the reorganisation of employment, professional practice, and community service.⁴⁴ Such changes are unlikely in both the short and the long term for, as Townsend says "the citadels of wealth and privilege are deeply entrenched", showing "tenacious capacity to withstand assaults".⁴⁵ Seabrook makes a related, but perhaps more fundamental point: "it can never be possible to define what constitutes *enough*; the ancient dream of sufficiency has to be jettisoned because it is not compatible with the economies of the west".⁴⁶

It can be argued that our attention (for little purpose) has thus been deflected from "the unreduced residue of real hardship which needs to be constantly re-identified and reduced by practical assistance".⁴⁷ Do considerations of feasibility, together with the wish to improve the position of the poorest poor, therefore justify traditional approaches to poverty? Perhaps in Popper's terms we should aim to make the most direct attack possible on human misery, reducing inequality on an incremental basis.⁴⁸ We would then accept the poverty line which as political artefact reflects the narrowness of our political conscience and will for change. Orshansky believes so — she writes that "the concept has to be limited by the purpose which is to be served by the definition", and that "a concept which can help influence public thinking must be socially and politically credible".⁴⁹

But the constraints of expediency can become self-fulfilling and self-justifying; once the definition of poverty is determined by practical considerations a substantial reduction in inequality is likely to become 'unnecessary' as well as 'impossible'. Further, it may be argued that governments show a remarkable capacity to ignore social research, even of the more cautious kind. The possibility of achieving small-scale change may appear too remote to compensate for the loss of radical critique — a theoretical challenge is seen as better than no challenge at all. The arguments cannot be easily resolved, but to the extent that policy remains impervious to social science, or changes occur irrespective of social research, the 'feasibility' rationale is weakened. The relationship of research to policy has been widely discussed and only a few comments in relation to poverty research are given here.

Underlying the research is the belief that social science inquiry can in fact help to ameliorate social problems. A belief, in Donnison's words, that "human needs can be recognised with a fair degree of consensus, that social priorities can be rationally debated, that social policies can help make the world a better place, and that . . . (social inquiry) . . . can help clarify these problems and make the policies more effective".⁵⁰ Rule argues that notions of how social inquiry "can and should redound to some benefit for society as a whole are not just value intimations; they potentially represent sociological models in their own right".⁵¹ He calls these "models of relevance". They can be directly linked with the strategies of poverty research and usefully point to its

limitations.

The strategies adopted to influence social policy include (a) raising general social awareness about the reality, extent, and consequences of poverty to produce greater acceptance of the need for change; (b) establishing basic information useful for pressure groups formed either by the poor or on their behalf; (c) providing data for professionals and academics leading to a widening of the knowledge base and thus strengthening all other strategies; and (d) direct appeal to the government.

The effort to increase social awareness about poverty, to goad the collective conscience into action rests on the premise of shared standards of social evaluation. Following Merton a social problem can be seen as a "substantial discrepancy between widely shared social standards and actual conditions of social life",⁵² and "a core of conditions which nearly everyone holds undesirable, no matter what his political affiliation",⁵³ can be postulated. On this basis, social science can usefully appeal to the public conscience. Thus Townsend believes that while "dramatic change is needed" it is imperative to "create a situation which the majority of people want and therefore develop constituencies of support throughout the country".⁵⁴

Not all definitions of poverty, however, will belong to that "core of undesirable conditions". There is likely to be greater social unease about scarcity of food than lack of participation. Further, even if we could assume general disapproval of something called poverty, there remain sharp political differences about the possible solutions. The limitation of absolute poverty through economic growth will receive far greater social support than the eradication of relative disadvantage through a restructured society. In Rule's terms, the most serious difficulty of the position is that it fails to provide "a coherent standard to designate what improvement of social conditions actually entails".⁵⁵

Those who reject the idea of shared social standards can appeal to a particular audience (or, to use Rule's term, "constituency"). The most obvious example is the Marxist approach, where the constituency is the proletariat. Although Townsend and others have maintained that poverty is rooted in class relations, poverty research (at least of the kind I have described) is by its assumptions, nature, and methods, non-Marxist. A closely allied and more characteristic model is directed towards disadvantaged groups — the 'unco-opted'.⁵⁶ Society is seen to be dominated by established interests or elites, and it is hoped that change may occur when "the diffuse groups at the bottom of the social heap . . . respond to critical insights . . . by coalescing their latent strength and seeking change".⁵⁷ Holman suggests that "the major impetus for change is unlikely to come from those who benefit from the system but rather from its victims — the poor".⁵⁸ Proponents of this model, "engaged activists who do not hesitate to commit themselves to those groups and values which they favour",⁵⁹ lack the optimism of classical Marxism.

Rule argues that confidence in this model is diminished by its own insights. The unco-opted, by definition, lack participatory power. Further, they may not share the researcher's convictions — in terms of Townsend's own study the denial of 'real poverty' was more prevalent among the poorest.⁶⁰ Powerful elites (presumed to have a vested interest in the continuance of poverty) may use social science information for their own ends; knowledge increases power. We face, therefore, Bryson's prediction: "Welfare proposals may worsen the position of the poor and increase their powerlessness by reinforcing existing arrangements, so that power becomes located more firmly in the hands of those now holding it".⁶¹

The third strategy, direct appeal to government officialdom, carries a clear message. "Those in power, aided by the proper social science techniques, can determine the needs of society more efficiently than ever."⁶² The government is seen as willing to act in the interests of all, and prevented from doing so only by inadequate information. The social scientist is the technocrat

who fills in the gaps. The model assumes social consensus and ignores the ways in which governments arbitrate between conflicting interests. The relative strength of the powerful versus the weak and disadvantaged is forgotten. Finally, in Rule's words, "the established nature of government power makes it difficult to argue that government institutions, if only better informed would necessarily act to improve social conditions".⁶³

Such problems apply to all forms of social science inquiry. They are, however, greatly magnified for poverty research. The findings have "sharpened the areas of disagreement, made the issues more uncertain, complex and technical".⁶⁴ Further, even the most modest definitions of poverty carry with them implicit requirements for some degree of redistribution. Failure to act stems from conflicting interests, and general lack of will, not insufficient information. And the problems of scope, objectivity and validity — which have their genesis in political conflicts — provide a convenient rationale for inaction.

The alternatives to policy-based research are, however, difficult to find. Neither resigned silence nor the hopeful anticipation of radical change seem acceptable. We have to work on the assumption that it is better to have information than not; that social science can lead to more insight if not to substantial change. But for researchers like Henderson and Townsend there would be no data, no argument; regressive changes would occur more easily without the weight of countervailing evidence.

I have argued that poverty research faces a number of unsolved theoretical and practical problems. Work which recognises the depth, breadth, and structural nature of deprivation is unlikely to produce the simple, flexible poverty line required for administrative purposes; and the magnitude of structural change implied by such research will almost certainly (in real terms) be ignored in toto. Research is bedevilled by the vain attempt to establish credibility, meeting the principles of validity, externality, and value-freedom. The 'real phenomenon' version of poverty is difficult to sustain, and arguments about the empirical merits of poverty measures are correspondingly misplaced. While both absolute and relative approaches claim to focus on the actual, not subjective, conditions of poverty the initial choice of criteria is firmly embedded in the values of the researcher. Research has generally played to the scientific and positivist obsessions of our age by camouflaging ideological issues with a mass of hard data. Finally, the practical influence of research is greatly diminished by lack of social consensus, powerful countervailing interests, and the powerlessness of 'the poor'.

I have said that poverty lines form a continuum in which the extent of inequality recognised as acceptable steadily diminishes. The more moderate definitions suggest only marginal reductions of inequality, while Townsend directs our attention to the entire structure of privilege and privation. In both cases, though, it is difficult to establish the implications of the poverty concept for the question of social justice. Concern with poverty reflects, whether in an intimate or distant fashion, egalitarian sentiments. Defining poverty, however, helps to ratify inequality within the specified limits — without establishing just why concern should cease beyond that point. Our attention is directed from the fact that it is inequality, not poverty, which is the value issue.

The resolution is to acknowledge equality as a primary principle of social justice. Any departure from equality must then demand justification. The only satisfactory grounds for justification have, I believe, been provided by Rawls. Social and economic inequalities, he argues, must be arranged to the greatest benefit of the least advantaged.⁶⁵ The entire structure of prevailing privilege, oppression, and disadvantage, thus hangs in the balance.

Such an approach would clarify some of the fact/value dilemmas raised previously and raise others. The principles of equality and redress become the explicit and guiding values of social policy and research. Factual enquiry must both establish the extent of inequality, and document

whose interests it serves. Ironically, as Harvey has shown, Rawls' position can justify Milton Friedman as well as Marx.⁶⁶ Thus conservatives may argue that "redistribution of incomes and wealth would impoverish many of those whom Townsend describes as poor".⁶⁷ But we have yet to demonstrate that inequality is a prerequisite for economic growth and improvement in absolute standards; yet to show at what level of inequality this surmise — if at all — holds true. The closely related value questions remain unresolved: we cannot say whether the continued growth of affluence is preferable to the reduction of relative poverty, we have yet to come to terms with the idea that there are "social limits to growth".⁶⁸

The extent to which real answers can be given to these questions must be limited. We are locked into the dilemma of a society which arranges socio-economic inequalities in a particular fashion and then claims (perhaps with some justification) that the status-quo must be retained to prevent the least advantaged from slipping further behind. It is difficult to prove the proposition true or false, or to demonstrate the case for a different, and fairer, distribution.

The dilemma, though, is not wholly unassailable. Utopias remain necessary, if only to illuminate the shabbiness of our own society. And it is certainly clear that, at least at the margins of inequality, the status-quo can be challenged in its own terms. Poverty research has shown how severe are the consequences of deprivation, how difficult to justify from any humanitarian view. We need to juxtapose the life of the poor with that of the rich, to ask whether such wide economic and social disparities, such a marked concentration of wealth even remotely resembles Rawls' dictum. Within the wider context of egalitarianism, the case for a constant reduction of extremes of inequality must constantly be made.

At present we know far more about unacceptable inequality at the bottom than at the top of the social scale. As 'concerned sociologists' we have always shown more interest in the sufferings of the poor, than in the privileges of the rich. Wars have been waged on poverty, not wealth; Commissions establish lines of poverty but not of affluence. The poor in Australia need action — not more research, nor a technically improved poverty line.

Research into wealth will face the same, probably greater, theoretical and political difficulties which confront poverty research. But until an equivalent amount of energy is given to both questions no progress can be made. I conclude with the final paragraph of Townsend's report:-

"We have observed the elaborate hierarchy of wealth and esteem, of which poverty is an integral part. If any conclusion deserves to be picked out from this report it is this, with which, some time, the British people must come to terms."⁶⁹

We seem very distant from the recognition in Australia today.

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Issues in Measuring Poverty by Nanak Kakwani

1. Introduction

Poverty has been in existence in the world for many centuries. But an awareness of its existence in western societies has increased only recently.¹ Social attitudes toward poverty have changed and the fact that many of the western economies have achieved a level of affluence where poverty can be eliminated without causing any significant hardship to the nonpoor sections of the community is increasingly recognized. It is also being increasingly realized that the developing countries will continue to need outside assistance to eliminate poverty or at least to reduce its intensity.² The prior problem, however, is to identify the poor and measure the intensity of their poverty so that methods can be devised to wage a war against it.

Consequently, the measurement of poverty involves two distinct problems. First is the identification of the poor. The poor are those who lack resources to obtain the 'minimum necessities of life'. The 'poverty line' is the level of income which is just sufficient to buy the so-called 'minimum necessities of life'. A person is poor if his or her income falls below that line.

The problem of specification of the poverty line is discussed in Sections 2 and 3 of this paper. It is argued that the poverty line should depend on the nutritional needs of a person or a family as well as society's values about the minimum standard of living. A probabilistic model of social choice proposed by Intriligator (1973) is utilized to incorporate the value judgements of all members of the society. Once the poverty line is determined, the second problem is that of constructing an index which would measure the intensity of poverty suffered by those below the poverty line.

Most of the literature on poverty concerns the number of individuals or families below the poverty line. The proportion of individuals (or families) below the poverty line, as such, does not reflect the intensity of poverty suffered by the poor. The problem is, how poor are the poor. They may have incomes that approximate the threshold level or they may have incomes almost near zero. If the deviation of a poor man's income from the poverty line is proportional to the degree of misery suffered by him, the sum total of these deviations divided by the number of poor may be considered a desirable measure of poverty. This index, which has been used by the United States Social Security Administration, is called the poverty gap. It indicates the average short-fall of income from the poverty line of all the poor taken together. There are two main drawbacks with this index: (1) it is completely insensitive to the number of poor, (2) it does not take into account the inequality of income among poor.

Sections 4 to 8 of this paper provide a discussion of alternative measures of poverty that avoid the drawbacks of previous measures. The only work which has so far appeared on this subject is that of Sen (1976, 1978), Kakwani (1977, 1980, 1980a, 1980b), Takayama (1977) and Drewnowski (1977).³ The purpose in this paper is to provide an evaluation of alternative measures without giving detailed derivations. A new class of poverty measures is proposed and the earlier measures by Sen (1976) and Kakwani (1980) are shown to be particular members of this class. A numerical method of computing the measures from grouped data is discussed in Section 9 and Section 10 provides an international comparison of poverty using data from 31 developing countries.

2. Specification of the Poverty Line

One of the earlier studies on poverty was done by Seebohm Rowntree (1899) who defined families to be in primary poverty if their total earnings are insufficient to obtain the "minimum necessities of merely physical efficiency". He estimated the minimum money costs for food which would satisfy the average nutritional needs of families of different sizes. To these costs he added the rent paid and certain minimum amounts for clothing, fuel and sundries to arrive at a poverty line of a family of given size. This poverty line based on the concept of physical subsistence involves a number of serious problems.⁴

One of the main criticisms against this concept of poverty is that it does not take into account the current living standards of the society. This concept of poverty may be valid in the developing countries where the malnutrition is still widely prevalent, but in developed countries, poverty no longer means starvation or near starvation. The old standards of poverty are not relevant to contemporary society.⁵ The new approach to the definition of poverty is based on the concept of "relative deprivation" which denotes the feelings of deprivation relative to others.⁶ In view of this, it seems best to recognise explicitly that any poverty line will be influenced by current living standards and should only be defined in relation to the living standards of a particular society at a particular date.⁷

Sen (1978), recognising these different aspects of poverty, defined two poverty lines, viz. (1) the nutritional poverty line, (2) the cultural poverty line; the first corresponds to the level of income at which the consumption level of an individual or of a family is nutritionally adequate, and the second identifies the level of income adequate for meeting necessities defined in terms of the overall living standards of that society. It seems useful to define a single poverty line which takes into account both these aspects of poverty. One such poverty line is

$$z(\beta) = z_0 + \beta(m - z_0) \quad (2.1)$$

where z_0 is the nutritional poverty line and m denotes either the median or the mean income of the society.⁸ β lies in the range $0 < \beta < 1$, which implies that the poverty line can neither be lower than z_0 (which represents a standard of minimum subsistence) nor higher than the mean or median income of the society.⁹ The value of β depends on the society's value judgement about the minimum standard of living which all its members must enjoy. The problem is that of obtaining social preferences about the alternative values of β from the individual preferences. This is discussed in the next Section.

3. A Probabilistic Approach to Measuring Poverty

Suppose in a society there are n families who are arranged in ascending order of their incomes $x_1 \leq x_2 \leq \dots \leq x_n$. These incomes are denoted by a vector $\underline{x} = (x_1, x_2, \dots, x_n)$. If $z(\beta)$ is the poverty line, then the poverty index $\theta(\underline{x}, z(\beta))$ is defined to be a unique function of x_1, x_2, \dots, x_n and $z(\beta)$, satisfying certain axioms. Assume that β takes m alternative values $\beta_1, \beta_2, \dots, \beta_m$, (all of which lie in the range $0 \leq \beta \leq 1$) which lead to m alternative poverty lines, as defined in (2.1). Each individual in the society has certain preferences among alternative poverty lines, which are summarized by individual probability vector

$$\underline{p}_i = (p_{i1}, p_{i2}, \dots, p_{im}); p_{ij} \geq 0, \text{ all } i, j; \sum_{j=1}^m p_{ij} = 1, \text{ all } i$$

where p_{ij} is the probability that an individual i will choose the poverty line $z(\beta_j)$.¹⁰ The social probability vector \underline{p} derived from individual probability vectors $\underline{p}_1, \underline{p}_2, \dots, \underline{p}_n$ is given by

$$\underline{p} = (p_1, p_2, \dots, p_m); p_j \geq 0, \text{ all } j; \sum_{j=1}^m p_j = 1$$

where p_j is the probability that the society will choose the poverty line $z(\beta_j)$.

The problem is, then, obtaining the social probability vector p from the individual vectors p_i . To tackle this problem, the following three axioms are proposed.¹¹

- 3.1 *Existence of Social Probabilities:* given any set of non-negative vectors p_i with unit sums, there exists a non-negative vector p , such that meaningful individual probabilities will yield meaningful social probabilities.
- 3.2 *Unanimity Preserving for a Loser:* if all individuals reject a poverty line with certainty then so does society, i.e., if $p_{ij} = 0$ for all i , then $p_j = 0$. Similarly, if all individuals accept a poverty line with certainty so does society, i.e., if $p_{ij} = 1$ for all i , then $p_j = 1$.
- 3.3 *Strict and Equal Sensitivity to Individual Probabilities:* social probabilities are strictly sensitive to individual probabilities in that an increase (decrease) in the probability that any one individual will choose a particular poverty line always increases (decreases) the probability that society will choose this poverty line.

Given these axioms, Intriligator (1973) proved that there is a unique rule for determining social probabilities, the average rule, according to which the social probabilities are simple averages of individual probabilities, i.e.

$$p_j = \frac{1}{n} \sum_{i=1}^n p_{ij}, \text{ for all } j = 1, 2, \dots, m.^{12}$$

There are m poverty indexes $\theta_j = \theta(x, z(\beta_j))$, each of which is associated with a social probability p_j , which is derived from individual probabilities. A weighted average of all these poverty indexes, as given by

$$E(\theta) = \sum_{j=1}^m \theta_j p_j = \frac{1}{n} \sum_{j=1}^m \sum_{i=1}^n \theta_j p_{ij}$$

provides an aggregated index of poverty which incorporates the value judgements (expressed in terms of probabilities) of all the members of a society. The problem of deriving a suitable index of poverty from given income distribution x and a poverty line $z(\beta_j)$ is discussed in the subsequent sections.

4. A General Class of Poverty Measures

In this and the subsequent sections, the poverty line will be denoted by z instead of $z(\beta)$. Let $q(\leq n)$ be the number of the poor who have income below the poverty line z . The ratio q/n has been widely used as a poverty measure and is called *the headcount ratio*.

The headcount ratio is a crude measure of poverty because of two main drawbacks. It is insensitive first to decreases in income of individuals below the poverty line; and second to transfers of income among the poor as well as from the poor to the nonpoor. To counter these shortcomings, Sen (1976) proposed that a suitable measure of poverty must satisfy the following two axioms.

Axiom 4.1. (Monotonicity) Other things remaining the same, a reduction in income of a person below the poverty line must increase the poverty measure.

Axiom 4.2. (Transfer) Other things remaining the same, a pure transfer of income from a person below the poverty line to anyone who is richer must increase the poverty measure, unless the number of people below the poverty line is strictly reduced by the transfer.¹³

The headcount ratio violates both axioms. The alternative poverty measures that satisfy these axioms will now be considered.

If μ is the mean income of a society and μ^* the mean income of individuals below the poverty line, a poverty index proposed by Kakwani (1977) is

$$K = \frac{q(z - \mu^*)}{n\mu} \quad (4.1)$$

where K is interpreted as the percentage of total income that must be transferred from the non-poor to the poor so that the poverty is completely wiped out. This measure, therefore, reflects the relative burden of poverty on the nation compared with its aggregate income.¹⁴ Further, if $z = \mu$, then it can be shown that K reduces to the relative mean deviation which is a well-known measure of income inequality.¹⁵

Next, divide the whole population into k mutually exclusive regions or groups. Denote μ_i as the mean income of the i th region and f_i the proportion of population in the i th region, then K can be written as

$$K = \frac{1}{\mu} \sum_{i=1}^k \mu_i f_i K_i$$

K_i being the poverty index in the i th region. This result may have interesting policy implications. It helps to analyze the contribution of poverty within each socio-economic group (or geographic region) to the aggregate poverty.¹⁶

Although the measure K (as defined in 4.1) has the intuitively appealing interpretation in terms of income transfer from the non-poor to the poor, it suffers from the drawback that it is sensitive to decrease (or increase) in income of the poor as well as the non-poor. Other things remaining the same, a decrease (increase) in income of a poor or non-poor person will increase (decrease) the poverty measure. If every person below the poverty line gets zero income, then μ^* will be equal to zero, and

$$K = q z / (n - q) \tilde{\mu}^*$$

where $\tilde{\mu}^*$ is the mean income of the non-poor.

This equation implies that the poverty measure decreases monotonically as the income of the non-poor increases, even if the income of the poor remains zero. It means that the poverty can be reduced by any amount only by increasing the affluence of the non-poor. This is clearly an undesirable feature of this poverty measure. The poverty measure as Sen (1979) maintains should reflect exclusively the interests of the poor and not permit a trade off with the fortunes of the rich. One such measure is by Sen (1976):

$$S = \frac{q(z - \mu^*)}{nz}$$

which differs from K only by a multiplicative constant. This measure remains unaffected by the increase in the mean income of the non-poor provided the poverty line is fixed.¹⁷

The poverty measure S is the product of two ratios, namely the head count ratio q/n which measures the percentage of families below the poverty line and the income gap ratio $(z - \mu^*)/z$ which indicates the proportion of the mean income short-fall of the poor families from the poverty line. These ratios reflect two different aspects of poverty, both of which are important. It can, therefore, be argued that the product of these ratios can be used as a measure of poverty,

but this product is completely insensitive to income transfers among the poor. Thus, the measure S violates the transfer axiom 4.2.

The measure S will provide adequate information about the intensity of poverty if all the poor families are assumed to have exactly the same income, which is less than the poverty level. In actual practice, the income among the poor is unequally distributed and, therefore, S cannot be an adequate measure of intensity of poverty. More inequality of income among the poor with mean income remaining unchanged should imply greater hardship to the extremely poor in a society. Therefore the value of the poverty should be higher in this case.

In order to take into account the inequality of income among the poor, we need to consider the social welfare function of the poor only,¹⁸ which we assume can be written as

$$W = W(\mu^*, G^*) \quad (4.2)$$

G^* being a measure of inequality of income among the poor. We have selected G^* to be the Gini index, which is the most widely used measure of inequality. Further, we impose the following restrictions on the social welfare function:

$$\frac{\partial W}{\partial \mu^*} > 0 \text{ and } \frac{\partial W}{\partial G^*} < 0 \quad (4.3)$$

which seems intuitively reasonable. Let ξ be the level of income which is received by every poor, would result in the same level of social welfare of the poor as their current distribution, then,

$$W(\xi, 0) = W(\mu^*, G^*) \quad (4.4)$$

which gives

$$\xi = g(\mu^*, G^*) \quad (4.5)$$

ξ being the equally distributed equivalent level of income among the poor.¹⁹

Equations (4.3) and (4.4) would imply

$$\frac{\partial g}{\partial \mu^*} > 0 \quad (4.6)$$

$$\frac{\partial g}{\partial G^*} < 0 \quad (4.7)$$

$$g(\mu^*, G^*) = \mu^* \text{ if } G^* = 0 \quad (4.8)$$

$$g(\mu^*, G^*) < \mu^* \text{ for } G^* > 0 \quad (4.9)$$

$\xi = g(\mu^*, G^*)$ can be interpreted as the effective income of the poor after taking into account the inequality of income among them. The conditions (4.8) and (4.9) above imply that the effective income will always be less than the actual mean income because of income inequality. Obviously, the income gap ratio now defined as $(z - \xi)/z$ will also be higher in the presence of income inequality among the poor than in its absence. Defining the poverty measure as a product of the head-count ratio and the income gap ratio $(z - \xi)/z$, we arrive at a class of poverty measures

$$Pg = \frac{q}{nz} [z - g(\mu^*, G^*)] \quad (4.10)$$

which in view of equations (4.6) to (4.9) satisfy the following conditions

$$\frac{\partial P_g}{\partial \mu^*} < 0$$

$$\frac{\partial p_g}{\partial G^*} > 0$$

$$P_g = \frac{q(z - \mu^*)}{nz} \text{ if } G^* = 0$$

$$P_g = \frac{q}{n} \text{ if } \mu^* = 0, \text{ i.e. all the poor get zero income.}$$

$$P_g = 0 \text{ if } \mu^* = z \text{ and } G^* = 0, \text{ i.e. when all the poor get incomes exactly equal to } z.$$

Since the Gini index increases if any transfer of income takes place from an individual to anyone who is richer,²⁰ therefore any poverty index satisfying the above conditions will necessarily satisfy both axioms 4.1 and 4.2.

A simple functional form of $g(\mu^*, G^*)$ in which P_g increases with G^* at a constant rate and at the same time satisfying conditions (4.6) to (4.9) is

$$g(\mu^*, G^*) = \mu^*(1 - G^*)$$

which on substituting in (4.10) leads to Sen's (1976) poverty measure:

$$S^* = \frac{q}{zn} [z - \mu^*(1 - G^*)] \quad (4.11)$$

The elasticity of the measure S^* with respect to G^* is

$$\eta_s = \frac{G^*}{S^*} \frac{\partial S^*}{\partial G^*} = \frac{\mu^* G^*}{(z - \mu^*) + \mu^* G^*}$$

which is clearly less than unity. Thus, if income among the poor is redistributed so that the Gini index reduces by 1%, the poverty index reduces by less than 1%. This elasticity provides the information regarding the effect on the poverty index of income inequality among the poor.

An alternative index is obtained by substituting

$$g(\mu^*, G^*) = \frac{\mu^*}{(1 + G^*)}$$

into (4.10) which, if denoted by K^* , gives

$$K^* = \frac{q}{nz} \left[z - \frac{\mu^*}{(1 + G^*)} \right] \quad (4.12)$$

The elasticity of K^* with respect to G^* will be

$$\eta_k = \frac{\mu^* G^*}{(1 + G^*)(z - \mu^* + zG^*)}$$

Comparing the elasticities of η_s and η_k , note that $\eta_k < \eta_s$, which shows that the poverty index S^* is more sensitive to the change in inequality of income among the poor than the alternative

index K^* . If the society attaches relatively greater importance to the inequality of income among the poor, the measure S^* will be preferred to the measure K^* .

5. Sen's Axiomatic Approach to Measuring Poverty

Sen's approach to measuring poverty is based on ordinal welfare comparisons. He defines a general measure of poverty as

$$\theta = A(z, q, n) \sum g_i v_i(z, \underline{x}) \quad (5.1)$$

where $g_i = z - x_i$ is the income short-fall of the i th poor and $v_i(z, \underline{x})$ is the weight attached to his income short-fall given the income distribution \underline{x} . It should be understood that $v_i(z, \underline{x})$ has been defined as a function of the whole income distribution vector \underline{x} and not of x_i alone which implies a more general welfare function than the one that is additive separable. One could also define the poverty measure as the sum-total of disutilities arising from being poor. This definition would correspond to the utilitarian welfare function and in that case v_i must depend only on the income x_i of the i th person and not also on the incomes of others. Sen (1978) dismissed this approach because it misses the idea of relative deprivation which is rather central to the notion of poverty. Instead, he determines the weights v_i on the basis of ranking of poor individuals, which in some ways captures the relative deprivation aspect of poverty.²¹

A brief discussion of Sen's (1976) axioms will now be provided.

Axiom 5.1. (Relative Equity). *For any pair of individuals i and j , if $W_i(\underline{x}) < W_j(\underline{x})$, then $v_i(z, \underline{x}) > v_j(z, \underline{x})$, where $W_i(\underline{x})$ and $W_j(\underline{x})$ are the welfare levels of i and j under a given income configuration \underline{x} .*

This axiom implies that if a person i is considered to be worse off than person j in a given income configuration \underline{x} , the income shortfall g_i of the i th should have higher weight than the income short-fall g_j of the j th person. Note that $W_i(\underline{x})$ is assumed to be ordinally measurable, which only indicates who is worse off than whom but says nothing about the welfare differences.

Axiom 5.2. (Monotonic Welfare). *For any i and j , if $x_i < x_j$, then $W_i(\underline{x}) < W_j(\underline{x})$.*

This axiom gives the relationship between income and welfare, implying that a person i with lower income is always considered to be worse off than person j with higher income. The axiom rules out the other factors which might affect the individual welfare; for instance, a richer person with poor health may feel worse off than a poorer person with sound health. Axioms 5.1 and 5.2 together imply that the larger the income short-fall, the greater should be the weight attached to it; i.e., $v_i(z, \underline{x})$ should decrease as i increases.

Axiom 5.3. (Rank Order). *The weight $v_i(z, \underline{x})$ on the income short-fall of person i equals the rank order of i in the interpersonal welfare ordering of the poor.*

This is the most demanding axiom. Sen (1976) justifies it by viewing deprivation as an essentially relative concept. The lower a person is on the welfare scale, greater is his sense of deprivation with respect to others in the same category. Therefore, the poverty measure must make the weight $v_i(z, \underline{x})$ decrease with the rank value $r(i)$ of the i th person; the poorest person has the largest rank value q while the least poor has the rank value of 1. The axiom is equivalent to saying that $v_i(z, \underline{x})$ on the income short-fall g_i is proportional to the number of poor persons with income level at least as high as that of person i .

An alternative justification of Sen's rank order axiom rests on the weighting procedure used in the Borda rule of voting. If there are, say, only four alternatives A, B, C and D arranged in order of preference, then this rule implies that the intensity of preference of A over B is the same as that of B over C and C over D. This equi-distanced weighting rule motivated Sen (1974) to propose a primitive axiom O which leads to his axiom 5.3. If the situation of being the i th person in the distribution x is denoted by (\underline{x}, i) , then axiom O states that "if everyone prefers (\underline{x}, i) to (x, j) with no intermediately ranked alternative and (\underline{x}, m) to (\underline{x}, ℓ) also with no intermediately ranked alternative, then the excess of weight on j 's income over that of i should be no more and no less than the excess of weight on ℓ 's income over that of m ".

Axiom 5.4 (Normalized Poverty Value). *If all the poor have the same income, then*

$$\theta = \frac{q(z-\mu^*)}{nz}$$

This axiom does not need explanation because it was argued in the previous section that the measure S provides adequate information about the intensity of poverty if all the poor have exactly the same income.

The following theorem which is due to Sen (1976) emerges from the above axioms.

Theorem 1: *For large numbers of the poor, the only poverty index satisfying axioms 5.1, 5.2, 5.3 and 5.4 is S^* (as defined in (4.11)).*

6. An Alternative Set of Axioms

It was pointed out in the previous section that Sen's rank order axiom 5.3 is most demanding. This axiom makes the weight $v_i(z, \underline{x})$ on the income short-fall of person i depend only on the number of people among the poor who are better off than i , thus ignoring completely their actual income. Kakwani (1980) proposed an axiom alternative to Sen's which makes the i 's sense of deprivation depend on the actual income enjoyed by those who are richer than i but still belonging to the category of poor. His axiom is formally stated as:

Axiom 6.1: *The weight $v_i(z, \underline{x})$ on the income short-fall of person i is proportional to the income of all other persons above him but below the poverty line z .*

The following theorem which is due to Kakwani (1980) can now be stated:

Theorem 2: *For large numbers of the poor, the only poverty index satisfying axioms 5.1, 5.2, 5.4 and (6.1) is K^* , where K^* is defined in (4.12).*

The poverty measure S^* differ from K^* in its characterization of the relative deprivation among the poor: while S^* concentrations on persons, K^* focus on income.²² Sen (1979) believes that the sense of relative deprivation is more readily captured by knowing how many people are richer than in knowing what their aggregate income happens to be. He, therefore, prefers S^* over K^* . There may be some who might believe that the aggregated income of the richer rather than their number is more important in capturing the deprivation aspect of poverty. Ideally, the sense of deprivation should take note of both the factors: the actual incomes enjoyed by those who are richer and the number of such persons who enjoy these incomes. To achieve this objective, the following new axiom is introduced.

Axiom 6.2. *The weight $v_i(z, \underline{x})$ on the income short-fall of the i th person is given by*

$$v_i(z, \underline{x}) = [\lambda a_i(z, \underline{x}) + (1-\lambda) b_i(z, x)]$$

where $a_i(z, x)$ is the number of poor persons with income level at least as high as that of person i and $b_i(z, x)$ is their actual income; λ being the constants such that $0 < \lambda < 1$.

$\lambda = 1$ makes the sense of relative deprivation dependent only on the number of the poor who are better off than the person in question, whereas $\lambda = 0$ implies the sense of relative deprivation depends only on the actual income enjoyed by these people. Thus, Sen takes the value of λ to be 1 and Kakwani assumes λ to be zero. It will be more desirable to assume the value of λ to lie between zero and unity. The particular choice of λ should depend on one's values regarding the sense of relative deprivation.

The following theorem provides a class of poverty measures satisfying axioms 6.2.

Theorem 3: *For the large number of the poor, the only poverty index satisfying axioms 5.1, 5.2, 5.4 and 6.2 is θ_λ , where θ_λ is given by*

$$\theta_\lambda = WS^* + (1-W)K^* \quad (6.1)$$

where

$$W = \frac{\lambda}{\lambda + (1-\lambda)(1+G^*)^\mu}$$

Note that if $\lambda = 1$, W becomes unity and, therefore, θ_λ leads to Sen's measure S^* . When $\lambda = 0$, W is zero then θ_λ gives Kakwani's measure K^* . Since $S^* > K^*$ for all non-zero G^* , equation (6.1) will provide the following upper lower bounds on θ_λ

$$S^* \geq \theta_\lambda \geq K^*$$

for all λ in the range $0 \leq \lambda \leq 1$.

7. A Generalization of Sen's Measure

This section presents a generalization of Sen's measure which was proposed by Kakwani (1980a). The generalization is motivated by the failure of Sen's measure to satisfy some sensitivity axioms which are discussed below.

Axiom 7.1: (Transfer Sensitivity I). *For any positive integer p and any pair of poor individuals i and j , if $j > i$, then $(\Delta\theta)_{i, i+p} > (\Delta\theta)_{j, j+p}$, where $(\Delta\theta)_{i, i+p}$ is the increase in poverty measure due to a transfer of income from the i th poor to the $(i+p)$ th poor.*

This axiom implies that the sensitivity of the poverty measure depends on the position of the transferer in the ordering of poor people when the number of positions between the transfer and the recipient is fixed. The poorer the transferer, the greater should be the increase in the poverty measure. Sen's measure gives equal weights to transfers of income at different positions of the ranking, i.e. the impact of a small transfer from the i th person to say the $(i+1)$ th person is the same for all values of i . This neutral position, Kakwani argues may *not* be a desirable thing if the poverty measure is based on the concept of relative deprivation.

Axiom 7.2: (Transfer Sensitivity II). *If a transfer of income takes place from the i th poor with income x_i to a poor with income $(x_i + h)$, then for a given $h > 0$, the magnitude of increase in poverty measure decreases as i increases.*

This axiom gives more weight to transfers of income at the lower end of the distribution than at

higher ends. Under this axiom, it is the income difference not the number of income positions which is fixed between the transferee and the transfer recipient. If the society is particularly averse to inequality among poor, the poverty measure must give maximum weight to a transfer from the poorest and the weight should decrease with the level of income. Sen's measure implies precisely the opposite weighting system, i.e., it gives least weight to the poorest and the weight increases with the level of income. Kakwani argues that such a weighting system is incongruent with existing social values. Therefore, he derived a class of poverty measures which includes all the three possible weighting systems: increasing, decreasing and constant (or neutral). The choice of a particular member should then depend on the preference for alternative weighting systems. His generalization is based on an alternative rank order axiom given below.

Axiom 7.3: (Generalized Rank Order). *For any poor individual i*

$$v_i(z, \underline{x}) = [q + 1 - i]^k$$

This axiom implies that the weight $v_i(z, \underline{x})$ on the income short-fall g_i is equal to the k th power of the number of people among the poor with at least as high an income level as person i . Note that if $k = 1$, this axiom is identical to Sen's rank order axiom 5.3.

It was pointed out earlier that Sen's axiom is based on the equi-distanced weighting rule proposed by Borda in voting theory. His axiom gives

$$v_i(z, \underline{x}) - v_{i+\rho}(z, \underline{x}) = A(z) \rho$$

which implies that the excess of the weight on the i th person's income short-fall over that of $(i + \rho)$ th person's income short-fall depends only on the number of positions between the i th and $(i + \rho)$ th person. This makes the poverty measure θ equally sensitive to a transfer of income at all income positions. In order to derive a class of poverty measures which allows the transfer of sensitivity to be increasing or constant or decreasing with the level of income, Borda's procedure of equi-distanced weights needs to be generalized. One such generalization of the Borda procedure is

$$v_i(z, \underline{x}) - v_{i+\rho}(z, \underline{x}) = \psi_i(\rho, k)$$

where k is a parameter and the function $\psi_i(\rho, k)$ either increases or decreases or remains constant with i depending on the value of k . The value of k may be chosen according to the society's preference for the sensitivity of the measure to an income transfer at different income positions. One of the simplest functional forms of $\psi_i(\rho, k)$ leads to Axiom 7.4.^{23, 24}

Theorem 4: *The only class of poverty measures satisfying Axioms 4.1, 4.2, 5.4 and 7.3 is given by*

$$\theta(k) = \frac{q}{n z \phi_q(k)} \sum_{i=1}^q (z - x_i) (q+1 - i)^k \quad (7.1)$$

$$\text{where } \phi_q(k) = \sum_{i=1}^q i^k$$

Consider now the special cases. Substituting $k = 1$ and using the fact that $\phi_q(1) = \frac{q(q+1)}{2}$, $\theta(k)$ reduces to Sen's measures S^* . If $k = 0$, $\theta(k)$ reduces to $\frac{q}{n} \frac{(z - \mu^*)}{z}$, which is a suitable measure of poverty in the special case in which all poor have exactly the same income.

Next, we consider the possible values of k for which the transfer-sensitivity axioms are satisfied.

Kakwani (1980) has demonstrated that the measure $\theta(k)$ will satisfy the Transfer-Sensitivity Axiom 7.2 for a value of k sufficiently larger than unity, which means this axiom is also violated by Sen's measure. Thus, this class of poverty measures allows one to choose any of the three possible weighting systems one considers appropriate.

Sen (1976) defined the measure of inequality for the whole population corresponding to the poverty index S^* as the value obtained in place of S^* by replacing z (the poverty level) by μ (the mean income of the community) and replacing q (the number of poor) by n (the total number of people in the community).

Therefore, substituting $q = n$ and $z = \mu$ in (7.1) gives a new class of inequality measures $\eta(k)$ corresponding to the poverty measure $\theta(k)$:

$$\eta(k) = \frac{1}{\mu \theta_n(k)} \sum_{i=1}^n (\mu - x_i) (n + 1 - i)^k \quad (7.2)$$

which for $k = 1$ leads to the Gini index. Thus $\eta(k)$ is a general class of inequality measures of which the Gini index is a particular member.

8. Two More Measures of Poverty

Takayama (1979) proposed a measure of poverty which is based on the 'censored' income distribution. The 'censored' income distribution is obtained from the actual income distribution by replacing all incomes above the poverty line by the poverty line income. The Gini index of the censored income distribution leads to his measure of poverty.

Algebraically, the measure is written as

$$T = \frac{1}{mn^2} [(z - \mu^*) q (n - q) + G^* q^2 \mu^*] \quad (8.1)$$

where m is the mean income of the censored income distribution and is given by

$$mn = q\mu^* + (n - q)z \quad (8.2)$$

If every poor person gets exactly the same income, the measure becomes

$$T = \frac{(z - \mu^*) q (n - q)}{mn^2} \quad (8.3)$$

which shows that this measure does not satisfy the normalization axiom 5.4. Note that all the measures discussed in the previous sections (with the exception of Kakwani's measure K) are based on Sen's normalization rule which clearly has got an intuitively appealing interpretation whereas this new normalization rule appears to be arbitrary with no interpretation. This may be regarded as a serious drawback of Takayama's measure.

A still more serious objection against Takayama's measure lies in its robust violation of the monotonicity axiom 4.1. The author himself points out that the measure has the disturbing property that a reduction in the income of someone below the poverty line can reduce (rather than increase) the degree of poverty. This drawback, although appears to be disturbing, is of no serious consequence for most practical work. Kakwani (1980c) has demonstrated that the monotonicity axiom will be violated by this measure only in an unusual situation when the poverty line strictly exceeds the median income of the distribution, i.e. when the society has more than fifty percent

of its population as the poor. Further, it can be easily demonstrated that, like Sen's measure, this measure also violates the transfer sensitivity axioms 7.1 and 7.2.

The elasticity of T with respect to G^* is

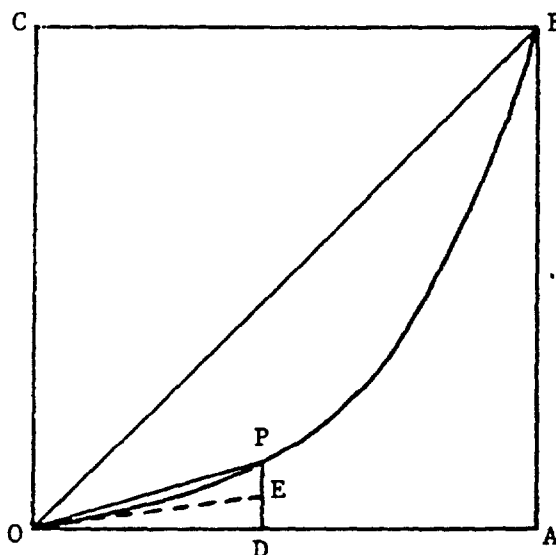
$$\eta_T = \frac{q \mu^* G^*}{(z - \mu^*) (n - q) + G^* \mu^* q} \quad (8.4)$$

and comparing it with η_s , note that $\eta_s > \eta_T$ for $q < n/2$, which means Sen's measure is more sensitive to the changes in equality of income among the poor than Takayama's measure provided the number of poor is less than the fifty percent of the population. This means that if the society attaches relatively greater importance to the inequality of income among the poor, Sen's measure will, in general, be preferred to Takayama's measure.

Another objection against Takayama's measure is that it can show decrease in poverty when the proportion of poor increases. This is clearly an undesirable feature of his measure but fortunately such a situation will occur only if the distribution of the poor is perfectly equal and income of the poor is near the poverty line z (or $q/n > 1/2$). Takayama defends his measure by pointing out that in this special case, which should be considered as an unrealistic and, therefore, negligible one, it could be argued that the perfectly equal distribution of the poor who form almost the entire population ought to be weighted more heavily than the narrow poverty gap in measuring poverty.

Takayama's measure is based on the axioms which are essentially the same as those of Sen. Therefore, the ranking of income distributions according to this measure should not differ significantly from that of Sen's measure because both measures are based on essentially same value judgments. Takayama's measure has an interesting interpretation in terms of censored distribution but one can argue that he arrived at this interpretation by utilizing an arbitrary normalization rule given in (8.3).

Drewnowski (1977) proposed a measure of poverty which in the diagram is given by the distance PE, where the point P corresponds to the poverty line income z and line OE is drawn so as to



make the area of the triangle ODE equal to the area under the Lorenz curve up to the point P. The Gini index G^* is then given by area OEP divided by area ODP. It can now be shown that Drewnowski's poverty index is given by

$$D = \frac{q \mu^* G^*}{n \mu}$$

which becomes zero when $G^* = 0$. This implies that if all the poor have exactly the same income, however small, this measure will indicate no poverty, which is a serious objection against this measure. If all the poor have zero income, the poverty should be maximum but this measure again shows no poverty. This objection makes this measure unattractive for any practical use.

9. An International Comparison of Poverty

This section provides an international comparison of poverty using the measures discussed in the previous sections. The calculations are based on the income distribution data for 31 developing countries compiled by Jain (1975), to whom the reader is referred for the definitions of income and income receiving units.

There are several difficulties associated with the use of income distribution data from different countries. These data are generally subject to large errors, and the magnitude of the errors is not likely to be the same for all countries. The definitions of income and income units, and the year of the survey may also differ from one country to another. These and some other deficiencies have been discussed at length elsewhere (see for instance Kuznets (1955), Titmuss (1962), Adelman and Morris (1971) and Kravis (1960)). Therefore, the conclusions emerging from the computations in this paper should be qualified.

For the purpose of comparing the poverty in different countries, it is necessary to have the estimates of GDP (Gross Domestic Product) per capita for each country in the units of a single currency, e.g., the U.S. dollars. The GDP per capita is available for almost all countries in terms of their domestic currencies. The conversion of these GDPs to the U.S. dollars at official exchange rates can be misleading because these rates do not necessarily reflect the purchasing power of different countries. Kravis, Heston and Summers (1978) have recently computed the real GDP per capita in terms of the U.S. dollars (adjusting for differences in the purchasing power of currencies) for more than one hundred countries. Their estimates of GDP derived by extrapolations are subject to large margins of error, but are still superior to the GDP estimates based on official exchange rates. These real GDP per capita estimates were indexed with base 100 for the United States of America. The values of this index are presented in column 1 of Table 1.

The poverty line in this illustration is defined as the income level of the 50th percentile in India in 1970. Using the "Kravis, Heston and Summers dollar" which is adjusted for purchasing power, the poverty line corresponds to \$216 which is approximately equal to 4% of the U.S.A. per capita real GDP in 1970. This definition is based on the belief that 50% of the population in India have income levels which are insufficient to provide adequate nutrition. For the purpose of international comparison of poverty, the same nutritional standards are used in all the developing countries.²⁵

The data on income distributions of these 31 countries were available only in grouped form giving (1) the number of persons with incomes in each range and (2) totals (for each range) of their incomes. From these basic data, we derived data on p 's and $L(p)$'s for each income range, where p is the cumulative proportions of persons and $L(p)$ is the cumulative proportion of their incomes. $L(p)$ which is called the Lorenz curve, is interpreted as the percentage of income received by the bottom p percent of the persons.²⁶ The Gini index is defined as one minus twice the area under the Lorenz curve.

In order to compute the poverty measures, the following equation of the Lorenz curve proposed by Kakwani (1980b) was estimated by ordinary least-squares after applying logarithmic transformation:

$$L(p) = p - A p^\alpha (1 - p)^\beta \quad (9.1)$$

where A, α and β are parameters each greater than zero. Note that $L(p) = 0$ for $p = 0$ and $L(p) = 1$ for $p = 1$. The sufficient conditions for $L(p)$ to be convex to the p axis are $0 < \alpha < 1$ and $0 < \beta < 1$. The first derivative of the Lorenz curve is always equal to x/μ , which for equation (9.1) gives

$$Ap^\alpha (1-p)^\beta \left[\frac{\alpha}{p} - \frac{\beta}{(1-p)} \right] = \frac{\mu-x}{\mu}$$

This equation provides values of p for a given value of x . Let p^* be the value of p when $x = z$; then p^* is the proportion of the poor in the population and $L(p^*)$ is the income share of the poor. The mean income of the poor, i.e. μ^* is then equal to $L(p^*)\mu/p^*$. The Gini index of the poor only was then computed by numerical integration:

$$G^* = 1 - (2\mu/p^{*2}\mu^*) \int_0^{p^*} L(p) dp$$

where $L(p)$ is defined in (9.1).

The class of poverty measures in (7.1) was computed by numerical integration:

$$\theta(k) = \frac{p^*z}{\mu} - \frac{k(k+1)}{p^{*k}} \int_0^{p^*} L(p) (p^* - p)^{k-1} dp$$

which for $k = 1$ leads to Sen's measure S^* .

The class of inequality measures (7.2) can similarly be written as

$$\eta(k) = 1 - k(k+1) \int_0^1 L(p) (1-p)^{k-1} dp$$

which can also be evaluated numerically using (9.1).

Table 1 and 2 present the computed values of the alternative poverty measures and Table 3 gives the inequality measures for different value of k . The figures in the brackets are the rankings of countries according to different poverty measures (or inequality measures).

The developing countries selected for this illustration were those which had the value of GDP index less than 25. Among the thirty-one countries selected, Bangladesh was the poorest according to the GDP index but it ranked fourth on the basis of head count ratio which is given in column 2 of Table 1. There are substantial differences among countries with respect to the level of poverty. These differences are displayed by all the measures of poverty.

The sensitivity of poverty measures θ_λ with respect to λ to Table 1 is shown by the fact that the measures increase monotonically with λ for all the countries. It should be noted that $\lambda=1$ leads to Sen's measures S^* and $\lambda=0$ gives Kakwani's measures K^* . Therefore, Sen's measures display higher poverty value than Kakwani's measures, although the differences between them are not very high.

The ranking of the countries according to measures θ_λ may change with λ , but the changes are not substantial. Therefore, it may be concluded the different assumptions about the relative deprivation do not lead to significantly different conclusions about the relative poverty in different countries.

Table 2 presents the numerical results on k-class poverty measures, where k is a measure of the degree of inequality aversion — or the relative sensitivity to transfers at different income levels. As k rises, the more weight is attached to transfers at the lower end of the distribution than at the middle and the top. The classes of measures $\theta(k)$ increase monotonically with k for all countries, showing that the measures are sensitive to the degree of inequality aversion. The numerical results clearly show that the differences of poverty among the countries became more prominent for larger values of k , although the ranking of countries do not change very significantly for different values of k .

The numerical results in Table 3 show that the inequality measure $\eta(k)$ increases monotonically with k . It is interesting to note that the larger values of k do not necessarily increase the differences of inequality among the countries, as in the case of poverty. The ranking of countries according to inequality may change with k , but the changes are not very prominent. There appears to be no positive correlation between inequality of income and poverty on the basis of cross-country comparisons. A very poor country can have a small inequality of income.

Table 1

Index of GDP per capita and other measures of poverty
when the poverty line is 4.0 percent of the U.S.A. per capita real GDP

Country	Index of GDP per Capita	Percent of Poor	Class of Poverty Measures Value of θ_λ				
			.00	.25	.50	.75	1.00
Bangladesh	4.29	59.4 (4)	.225 (4)	.278 (4)	.281 (4)	.283 (4)	.285 (4)
Chad	4.58	60.1 (3)	.261 (10)	.264 (10)	.267 (10)	.69 (10)	.271 (10)
Malawi	4.58	67.0 (1)	.350 (2)	.355 (2)	.359 (2)	.362 (2)	.365 (2)
Burma	4.81	52.2 (7)	.275 (5)	.278 (5)	.281 (5)	.283 (5)	.284 (5)
Indonesia	5.12	65.4 (2)	.272 (6)	.275 (8)	.278 (8)	.280 (7)	.282 (7)
India	5.98	50.4 (8)	.272 (7)	.277 (6)	.280 (6)	.282 (6)	.283 (6)
Tanzania	6.04	58.0 (5)	.393 (1)	.403 (1)	.408 (1)	.412 (1)	.414 (1)
Uganda	7.90	29.2 (17)	.115 (17)	.117 (17)	.118 (17)	.118 (17)	.119 (17)
Sudan	8.10	34.9 (11)	.162 (13)	.164 (13)	.166 (13)	.166 (13)	.167 (13)
Kenya	8.30	54.8 (6)	.271 (8)	.276 (7)	.278 (7)	.279 (8)	.280 (8)
Botswana	8.66	42.6 (10)	.298 (3)	.309 (3)	.314 (3)	.316 (3)	.318 (3)
Sri Lanka	10.10	15.6 (25)	.041 (27)	.042 (27)	.042 (27)	.042 (27)	.042 (27)
Thailand	10.10	33.7 (13)	.088 (19)	.089 (19)	.089 (19)	.089 (20)	.089 (20)
Philippines	10.40	29.6 (16)	.147 (15)	.150 (15)	.151 (15)	.152 (15)	.152 (15)
Egypt	11.90	20.2 (21)	.087 (20)	.089 (20)	.089 (20)	.090 (19)	.090 (19)
Ecuador	14.10	42.8 (9)	.268 (9)	.273 (9)	.275 (9)	.276 (9)	.276 (9)
Rhodesia	14.70	33.5 (14)	.127 (16)	.128 (16)	.129 (16)	.129 (16)	.129 (16)
Tunisia	14.70	24.6 (19)	.062 (24)	.062 (25)	.062 (26)	.062 (26)	.062 (26)
Honduras	14.80	34.8 (12)	.225 (11)	.231 (11)	.232 (11)	.233 (11)	.234 (11)
El Salvador	15.10	18.2 (24)	.084 (21)	.086 (21)	.086 (21)	.086 (21)	.086 (22)
Peru	16.80	28.2 (18)	.176 (12)	.182 (12)	.183 (12)	.184 (12)	.185 (12)
Colombia	17.40	19.9 (22)	.062 (25)	.063 (24)	.063 (24)	.063 (25)	.063 (25)
Ivory Coast	17.40	20.4 (20)	.038 (29)	.038 (29)	.038 (29)	.038 (29)	.038 (29)
Dominican R.	18.10	11.5 (28)	.031 (30)	.032 (30)	.032 (30)	.032 (30)	.032 (30)
Turkey	18.10	19.9 (23)	.090 (18)	.092 (18)	.093 (18)	.093 (18)	.093 (18)
Guyana	18.30	9.3 (29)	.064 (22)	.069 (22)	.070 (22)	.071 (22)	.071 (22)
Iraq	18.70	31.7 (15)	.157 (14)	.158 (14)	.158 (14)	.159 (14)	.159 (14)
Malaysia	18.90	13.5 (26)	.063 (23)	.065 (23)	.065 (23)	.066 (23)	.066 (23)
Iran	19.40	8.7 (30)	.058 (26)	.062 (26)	.063 (25)	.064 (24)	.064 (24)
Fiji	20.30	5.3 (31)	.007 (31)	.007 (31)	.007 (31)	.007 (31)	.007 (31)
Brazil	22.80	11.9 (27)	.041 (28)	.041 (28)	.042 (28)	.042 (28)	.042 (28)

Table 2

k-Class poverty measures and Takayama poverty index
when the poverty line is 4.0 percent of the U.S.A. per capita real GDP

Country	$\theta(k)$					Takayama's Index
	0.0	.5	1.0	1.5	2.0	
Bangladesh	.219 (7)	.266 (5)	.285 (4)	.302 (5)	.315 (5)	.164 (9)
Chad	.204 (10)	.251 (10)	.271 (10)	.290 (9)	.305 (8)	.152 (10)
Malawi	.282 (2)	.339 (2)	.365 (2)	.388 (2)	.405 (2)	.207 (3)
Burma	.228 (5)	.269 (4)	.284 (5)	.296 (7)	.304 (9)	.179 (6)
Indonesia	.209 (9)	.260 (9)	.282 (7)	.305 (4)	.323 (4)	.152 (11)
India	.219 (8)	.265 (6)	.283 (6)	.300 (6)	.313 (6)	.181 (5)
Tanzania	.329 (1)	.387 (1)	.414 (1)	.435 (1)	.450 (1)	.280 (1)
Uganda	.089 (17)	.112 (17)	.119 (17)	.128 (17)	.135 (17)	.078 (17)
Sudan	.130 (14)	.158 (13)	.167 (13)	.176 (13)	.183 (13)	.112 (14)
Kenya	.221 (6)	.264 (8)	.280 (8)	.295 (8)	.306 (7)	.170 (8)
Botswana	.248 (3)	.295 (3)	.318 (3)	.335 (3)	.348 (3)	.229 (2)
Sri Lanka	.031 (29)	.042 (28)	.042 (27)	.045 (27)	.048 (27)	.029 (29)
Thailand	.074 (18)	.091 (18)	.089 (20)	.092 (21)	.092 (21)	.059 (21)
Philippines	.117 (15)	.143 (15)	.152 (15)	.162 (14)	.169 (14)	.105 (15)
Egypt	.068 (20)	.086 (20)	.090 (19)	.096 (19)	.101 (19)	.063 (19)
Ecuador	.231 (4)	.265 (7)	.276 (9)	.283 (10)	.286 (10)	.197 (4)
Rhodesia	.102 (16)	.125 (16)	.129 (16)	.136 (16)	.141 (16)	.086 (16)
Tunisia	.057 (22)	.067 (22)	.062 (26)	.060 (26)	.057 (26)	.047 (23)
Honduras	.191 (11)	.223 (11)	.234 (11)	.241 (11)	.246 (11)	.172 (7)
El Salvador	.066 (21)	.083 (21)	.087 (21)	.092 (20)	.096 (20)	.062 (20)
Peru	.146 (12)	.174 (12)	.185 (12)	.193 (12)	.200 (12)	.136 (12)
Colombia	.051 (23)	.064 (23)	.063 (25)	.066 (25)	.068 (25)	.046 (24)
Ivory Coast	.036 (27)	.044 (27)	.038 (29)	.036 (29)	.035 (30)	.030 (27)
Dominican R.	.024 (30)	.033 (30)	.032 (30)	.034 (30)	.036 (29)	.023 (30)
Turkey	.071 (19)	.089 (19)	.093 (18)	.099 (18)	.103 (18)	.066 (18)
Guyana	.050 (24)	.064 (24)	.071 (22)	.079 (22)	.085 (22)	.049 (22)
Iraq	.139 (13)	.158 (14)	.169 (14)	.159 (15)	.157 (15)	.117 (13)
Malaysia	.048 (25)	.062 (25)	.066 (23)	.071 (23)	.075 (24)	.046 (25)
Iran	.044 (26)	.058 (26)	.064 (24)	.071 (24)	.078 (23)	.044 (26)
Fiji	.006 (31)	.010 (31)	.007 (31)	.008 (31)	.008 (31)	.006 (31)
Brazil	.032 (28)	.042 (29)	.042 (28)	.044 (28)	.046 (28)	.030 (28)

Table 3

K-Class Inequality Measures

Country	$\eta(k)$			
	Value of k			
	.5	1.0	1.5	2.0
Bangladesh	.248 (31)	.342 (31)	.407 (31)	.451 (31)
Chad	.280 (28)	.361 (30)	.427 (30)	.467 (30)
Malawi	.365 (19)	.466 (20)	.528 (21)	.570 (23)
Burma	.264 (30)	.380 (28)	.460 (28)	.513 (28)
Indonesia	.374 (16)	.449 (22)	.497 (26)	.529 (26)
India	.355 (21)	.477 (19)	.554 (19)	.604 (20)
Tanzania	.456 (6)	.597 (6)	.680 (6)	.732 (6)
Uganda	.293 (27)	.400 (27)	.472 (27)	.521 (27)
Sudan	.323 (23)	.446 (23)	.526 (22)	.580 (21)
Kenya	.521 (3)	.623 (4)	.678 (7)	.710 (8)
Botswana	.422 (10)	.574 (8)	.668 (8)	.729 (7)
Sri Lanka	.275 (29)	.377 (29)	.446 (29)	.493 (29)
Thailand	.399 (12)	.509 (14)	.572 (16)	.610 (19)
Philippines	.364 (20)	.494 (17)	.576 (15)	.630 (15)
Egypt	.309 (24)	.434 (24)	.518 (23)	.575 (22)
Korea				
Ecuador	.544 (1)	.684 (1)	.760 (1)	.804 (1)
Rhodesia	.543 (2)	.651 (2)	.708 (3)	.742 (4)
Tunisia	.366 (18)	.502 (15)	.586 (14)	.640 (14)
Honduras	.468 (5)	.620 (5)	.708 (4)	.763 (3)
El Salvador	.332 (22)	.465 (21)	.553 (20)	.613 (18)
Peru	.446 (7)	.594 (7)	.683 (5)	.739 (5)
Colombia	.426 (9)	.555 (10)	.631 (10)	.679 (10)
Ivory Coast	.402 (11)	.534 (11)	.614 (11)	.663 (11)
Dominican R.	.369 (17)	.492 (18)	.570 (18)	.620 (17)
Turkey	.435 (8)	.567 (9)	.645 (9)	.695 (9)
Guyana	.298 (26)	.419 (26)	.504 (24)	.564 (24)
Iraq	.483 (4)	.630 (3)	.714 (2)	.764 (2)
Malaysia	.390 (14)	.517 (13)	.597 (13)	.649 (13)
Iran	.383 (15)	.499 (16)	.572 (17)	.621 (15)
Zambia				
Fiji	.302 (25)	.422 (25)	.503 (25)	.559 (25)
Brazil	.392	.524	.606	.660

Footnotes

1. Harrington (1962) was perhaps the first to emphasize the poverty issue in the United States. For other outstanding contributions on the subject of poverty in advanced countries, since 1962, see Atkinson (1969), Ferman, Kornbluh and Haber (1965), Fishman (1966), Townsend (1965), Tobin (1965) and Budd (1967). There is also a considerable amount of excellent work done on poverty in India for which Bardhan and Srinivasan (ed.) (1974) is the best reference. An international comparison of poverty is provided by Kakwani (1980).
2. For a number of years, the World Bank has been particularly interested in financing projects in the developing countries leading to a reduction in poverty.
3. For empirical work using the refined poverty measures see Bhatta (1974), Seastrand and Diwan (1975), Alamgir (1976), Kakwani (1977, 1980, 1980a, 1980b), Anand (1977) and Ahluwalia (1977).
4. These problems have been discussed at length by Townsend (1954, 1962). For a brief but illuminating discussion, see Sen (1978).
5. See Wedderburn (1974), page 1.
6. The term relative deprivation was coined by Stouffer (1949) and subsequently developed by Merton (1957) and Runciman (1966). This term is used here in a narrower sense meaning a level of income sufficiently low to be regarded as creating hardship in terms of society's current living standards.
7. See Atkinson (1974), page 48.
8. Note that the basic unit of measurement of poverty should be the nuclear family instead of individuals because of the income sharing phenomenon which is common between married couples and dependent children. Naturally, the income required to maintain any given level of living will be different for the families of different sizes and composition. In order to measure the effect of family composition attempts have been made to construct consumer unit scales which must be used to arrive at the poverty lines for the families of different composition. This problem has been discussed at length by Kakwani (1977, 1980). Here it is assumed that the incomes of families have been adjusted (by the consumer unit scale) to take into account the effect of family composition.
9. Fuschs (1969) argues that the poverty standard should be linked to the median income. Drewnowski (1977) suggests the poverty line to be equal to the mean income of the society. Under this definition, the poor are those who gain when income becomes more evenly distributed, and the non-poor are those who lose.
10. Note that this procedure of assigning probabilities to the alternative poverty lines takes into account the intensity of preferences of individuals (i.e. it introduces an element of cardinality). If an individual feels very strongly for a poverty line, then he will choose the most preferred line with probability unity and the probabilities assigned to the remaining poverty lines will then be zero.
11. These are basically Intriligator's axioms slightly modified for the poverty line.
12. In addition to the three axioms 3.1, 3.2 and 3.3, the average rule satisfies a number of other important conditions which are discussed by Intriligator (1973). Note that this collective choice rule violates one of Arrow's (1963) conditions, namely the condition of "independence of irrelevant alternatives". This is because each pairwise comparison is affected by the probabilities assigned to the remaining poverty lines.
13. Note that this is the modified version of Sen's (1976) earlier transfer axiom. "Given other things, a pure transfer of income from a person below the poverty line to anyone who is richer must increase the poverty measure" which did not rule out the possibility of the richer person crossing the poverty line due to a transfers. This modification was motivated because Sen's poverty measure could violate his earlier axioms. For further discussion see Sen (1977, 1979).

14. See Sen (1978), page 33.
15. Sen's (1976) poverty measure to be discussed in the next Section corresponds to the Gini index, which is another widely known measure of inequality.
16. For an empirical application of this result on Malaysian data see Kakwani (1977).
17. It seems reasonable to assume that the poverty line changes with the general level of living only in the long run. Even if the poverty line changes with the mean income of the society according to equation (2.1), the above condition is still satisfied provided $0 \leq \beta < 1$.
18. This is because we want to derive the poverty measure which is unaffected by the incomes of the non-poor.
19. This concept of the equally distributed equivalent level of income was introduced by Atkinson (1970).
20. See Atkinson (1970), Sen (1973) and Kakwani (1980).
21. The rank order weighting has been widely used in voting theory, see for instance, Borda (1781), Black (1958), Fine and Fine (1974), Fishburn (1973), Hansson (1973) and Gärdenfors (1973).
22. Sen (1979).
23. See Kakwani (1980).
24. It seems reasonable to choose the simplest functional form in the absence of a convincing case for any alternative forms.
25. This may not be realistic because the nutritional requirements of people depend on physical features, climatic conditions and work habits.
26. For a more formal definition of the Lorenz curve see Kakwani and Podder (1973, 1976), Kakwani (1977) or Kakwani (1980).

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Poverty Lines: The Social Welfare Policy Secretariat's Approach

by Jim Cox

Today I would like to discuss the strategy which the Social Welfare Policy Secretariat has decided to adopt in its work on poverty. I hope that we would be able to have a discussion about this strategy. We would be particularly interested in learning whether you think there are any other activities or approaches which we are not pursuing, but should. My first job, however, is to give you some understanding of the constraints we are working under and the problems raised by some previous attempts to establish poverty lines in Australia.

Background

As public servants, the staff of the Secretariat have less freedom than have academics to plan our own work and follow our own interests. The initial work program of the Secretariat included the follow-up process to various official reports to Government including the Henderson Poverty Enquiry. Given that our charter is very much to provide information which would be of fairly immediate relevance to the policy process, we paid particular attention to the Minister's statements in this general area. It is therefore useful to look at what Senator Guilfoyle has said.

In reply to a question in the Senate on 8 March 1979 she said this:

"In Australia I would think that we should be looking at what is a poverty line given present circumstances in the Australian context. I think that what has been established and quoted as the poverty line is something that may have doubtful validity because of its origin and the fact that it is based on relativities between expenditures of different families in New York in 1954." The Minister went on to say that: "I would think that in this country it would be possible to have some discussion as to a poverty line. It could well be that the poverty line is higher or lower, whichever way we want to look at it, than the one that we use and which is frequently quoted." Finally, she made the extremely important point that a study of poverty lines is quite a different matter from a review of the level of pensions and benefits. The latter are determined in the Budget context.

Senator Guilfoyle returned to the subject on 25 October 1979 during a speech on the Social Services Amendment Bill. She said: "I have some reservations about the Henderson poverty line, mainly because it is no less arbitrary than anyone else's judgement might be of what an adequate social security line in this country ought to be. My main objective would be to see what, in present day terms and conditions, ought to be the line by which we would judge families in need in this country. I would certainly welcome any work that could be done to devise a poverty line suited to Australian conditions in the late 1970s." She then added an extremely important point. "In setting payment levels," she said, "it is important to reach a reasonable balance between the needs and desires of those who receive assistance and the burden placed on those who had to find \$9,000m for expenditure by my Department this year."

Then, during a discussion in the Senate on welfare and taxation reform which took place on 28 February 1980 Senator Guilfoyle announced: "I have recently asked the Social Welfare Policy Secretariat, in consultation with my own Department, to examine the whole issue of alternative approaches to measure a poverty line that would be relevant to Australia in the 1980s. I have asked the Social Welfare Policy Secretariat to take up this matter with the Australian Bureau of Statistics, and to look particularly at the ways in which we could use household expenditure survey data so that equivalence scales that would have some meaning could be derived. The Senate will recall that Professor Henderson's poverty lines used equivalence scales that were derived in New York in 1954 because there was no Australian data that could be applied. If we

are to read in our newspapers and hear through our media, as we do at such frequent intervals, that certain numbers of people in this country are living below the poverty line, it seems to be that there ought to be some contemporary measurement of what would be an appropriate poverty line below which no person in this country should be allowed to fall."

An article on the poverty line appeared in the *Age* newspaper the next day. Much of what had been said in the Senate on the previous day was repeated here. But the Minister was quoted as adding: "It will be very interesting to see what the Secretariat regards as, say, a basket of essential commodities, services, housing, travel and so on. Then you might have a closer idea of what you are trying to relate your income security system to." The question of regional variations in the poverty line was also raised in that report.

In summary Senator Guilfoyle has been saying consistently over the past year that, in view of the tradition in this country of comparing individuals' living standards with the poverty line, that line should at least be based on the contemporary situation in Australia. This poverty line may be higher or lower than Henderson's. But there can be no guarantee that the level of pensions and benefits would be raised (or lowered) to the new poverty line. This is because there are many other factors which need to be taken into account in reviewing the level of pensions and benefits.

The Concept of Poverty

I have already been asked a number of times about which concept or working hypothesis of poverty is being used by the Social Welfare Policy Secretariat. One could argue I suppose from the strictly practical point of view that the question is irrelevant. The Minister has already indicated the kind of data she wants and the sort of activity she feels we should be engaging in to get it. But I think it will be useful to say rather more than that.

In the final analysis, I believe, choice of a poverty line, or any other criterion of what constitutes need, is a matter for judgement. If one looks at such things as the distribution of income between households in the community, or patterns of household expenditure at different income levels, or even Professor Townsend's index of deprivation among U.K. households, one finds a continuum of need. This means that whatever income level is chosen as the poverty line, the circumstances of people with incomes slightly above the poverty line are very little different from those of people with incomes slightly below it. This means that inevitably there is an arbitrary element in the choice of any one level of income as the poverty line.

At this point it becomes almost second nature for public servants to pass the problem over to Ministers, while saying that it is a political decision. And I think we are right to do this. But what sort of information should we offer to politicians to help them to make these decisions?

One piece of information which surely would be of interest, is the conceptions of poverty which are held by the general public. I don't know of anyone who has attempted to ask this question of the Australian population, but Professor Townsend has asked it of the British public with interesting results. He records in his book that he found it hard to categorise the answers. But, finally, he concluded that seven per cent of respondents defined poverty in terms of starvation while another 25 per cent defined poverty in terms of what he called subsistence — the absence of such essentials of life as food, shelter or clothing. A further 29 per cent answered in terms of identifying groups — such as pensioners, the low paid or large families — which might be expected to fail to reach the subsistence standard. Eight per cent defined poverty in terms of mismanagement, nine per cent defined it in relative terms, eight per cent thought that there was not any poverty to describe while other answers amounted to eight percent. I suspect that to the man in the street poverty is the absence of the essentials of a decent life — poor nutrition, crowded, unsafe or insanitary housing, being cold in winter, and so on. This seems to be the view that was

taken during the early days of wage determination by the Arbitration Court. This does not mean that there is an unchanging poverty standard, for as it becomes richer society may well become more generous in its view of what constitutes a decent minimum standard of living. Many would now accept, for example, that a motor car is one of the essentials of life in country areas in Australia and in some suburban areas. But it remains to be seen what degree of consensus exists as to the components of a poverty standard of living.

I wish to defer for a while comment on the many difficulties involved in specifying what comprises a decent minimum standard of living. But if such a standard could be specified it would certainly be of great interest to know which percentage of the various kinds of pensioners and beneficiaries — and others with low incomes — fail to meet it.

Next, it seems clear that the politicians wish to be able to compare the poverty line with the level of pensions, benefits, etc. This means that whatever poverty line is chosen, it is ultimately necessary to make the translation between it and a level of income below which people are likely to be poor. And when comparing pension levels with the poverty line it is important to include the wide range of fringe benefits which Commonwealth and State government authorities, and private businesses, make available to eligible pensioners.

Finally, the relativities between the rates paid to various groups of pensioners and beneficiaries are almost of as much interest as the poverty level of income itself. The reason for this is that there are some 2.4 million people receiving Commonwealth pensions and benefits. A significant increase in the real value of all pensions and benefits while not, I suppose, unthinkable would certainly be very expensive. On the other hand there does not seem to be much of a constituency for reducing the real value of pensions. But there may be greater scope in varying relativities in the unemployment benefit structure where some rates are indexed and others are not. And there are a number of additional payments in the income security structure (such as mother's or guardian's allowance, supplementary assistance, and additional pension for children) which have not been indexed to the CPI or increased for some years. It seems to me that there could be a deal of interest in the question of the proper relationship of these additional payments to the standard or married rates. I conclude that it is important to determine how much more income a large family needs to achieve the same standard of living as a small one, and to do this not only at some poverty level of income, but at other levels as well.

In summary, then, I have defined four kinds of information about poverty which I believe would be useful to Ministerial decision-makers. They will be interested in knowing what the community regards as a poverty standard of living and what sorts of people in which circumstances fail to reach the standard. They will want us to translate the poverty standard into an amount of income, against which incomes actually received can be compared. Finally, they will be interested in a set of relativities which may show (at various levels of income) how much additional income a larger family required to achieve the same standard of living as a smaller one.

The Secretariat's Activities

Because of the difficulty of the subject and the absence of much previous Australian work on which to build, the Secretariat has decided to investigate a number of approaches in its work on poverty. While any one approach may be less than completely successful we hope that the combination of all the approaches will throw some light on the subject. We have decided to limit ourselves in the first instance to data which have already been collected or which can be collected fairly readily. While this may leave some questions unanswered, it seems better to us to see what can be done with a moderate expenditure of time and effort before launching any grand schemes.

Equivalence Scales

I wish first to discuss our work on the vexed question of estimating equivalence scales from household expenditure survey data. I should add that we have been greatly assisted by officers of the ABS who have carried out the statistical analysis.

The intention of equivalence scales is to indicate how much extra income a larger family needs than a smaller one to achieve the same standard of living. Rather than prescribing what different families should spend, the idea is to look at what they do spend. The essential problem is that households are constrained to live within their resources and the observed pattern of expenditure is as much the result of this constraint as it is of needs.

It seems reasonable, at least to me, to suggest that if a larger family spends more on food than a smaller one on the same income, then food is a necessity and the larger family is the poorer. What one needs then is some criterion which would enable one to judge when families of different composition had achieved the same standard of living. Such a criterion cannot be observed, and one needs recourse to some theory.

The Secretariat is only too aware that to base policy advice on some theoretical statistical technique is to invite scepticism, and that some previous attempts to estimate equivalence scales have been rather spectacular failures. We have considered it wise to investigate one simpler and one more sophisticated technique. I would hope that both techniques would yield broadly similar results.

The simple technique is to define a group of essential commodities (such as food, housing, clothing, and fuel and power) and to make the assumption that households which spend the same proportion of their total expenditure on these necessities share the same standard of living. One can then plot against income the ratio of spending on essentials to total spending, fit a curve by regression analysis, and calculate the average level of income at which some particular value of the ratio is reached. This is then repeated for all household types of interest and the ratio of income levels forms an equivalence scale.

The assumption that households which spend the same proportion of their total spending on essentials share the same standard of living is unlikely to be true in all cases. But I think that it may be a reasonable working hypothesis. This technique has two great advantages. It is fairly easy to explain to non-specialists and it has been repeated (to their satisfaction) by a number of investigators in a variety of countries. It is, so far as I know, the only technique for estimating empirical equivalence scales which has been adopted by a Government authority — the Canadian statistical organisation.

A more sophisticated approach to the problem of estimating equivalence scales would be to take account of spending on all commodities — and not just of a group of them more or less arbitrarily chosen as essentials — and explicitly to assume a specific utility function. The second technique, then, is one which has been developed and applied to Australian data by Professor Kakwani who is here today. If only for that reason I do not now propose to say much about it. But this technique has a number of features which, from our point of view, are valuable. The estimated scales which Professor Kakwani has published are plausible and do not appear to vary too much with the level of income. And because his scales can be expressed as a function of prices and incomes one can, using current data, project them forward from the mid-1970s to the present day. This might help us gain some impressions of the importance of the price changes of the last few years.

Basket of Commodities

We intend to use less formal data for the other aspects of poverty lines study. The Secretariat is engaged in an extensive program of consultations, holding discussions with Government departments, community organisations and individuals in all States and the Northern and Australian Capital Territories. One important question is what degree of consensus exists on the question of what is a poverty standard of living. Most people would agree that the minimum standard should include the biological necessities of food, clothing, shelter, and fuel and power. Nor would many seriously suggest that the food component should be made up of a nutritious but boring diet of milk, soya beans and potatoes. Beyond this there could be an enormous amount of disagreement about which foods should be in the minimum but decent regimen, what quality of housing and so on. Because nutritionists, like other health professionals, are only too willing to tell us what is good for us, the food component of the basket is perhaps the easiest to draw up. But there are particular difficulties to do with housing. The amount one has to pay for housing of a given quality varies greatly according to location and whether one is an owner, renter or buying a home. And housing expenses are particularly hard to vary in the short run. Special treatment of housing costs in the poverty line (e.g. by following Professor Henderson's practice of calculating poverty lines both before and after housing costs) may be required.

The scope for disagreement increases further when one moves from the 'biological necessities' to consider such questions as when is a car, or a washing machine or a refrigerator, essential?

I have two thoughts as to how we might deal with this impressive list of difficulties. First, we can attempt to sample opinion. We feel that the best way to do this would be to talk to people who have considered experience of the problems of those with low incomes, but are able to stand back and analyse the experience. This is a major aim of our program of visits and discussions. Secondly, we might draw up alternative poverty lines to illustrate the range of opinion that may exist.

Having established one or a variety of poverty standards, the next job is to represent it by some particular poverty level of income. This raises a number of difficulties. To what extent, for example, do low income people pay more than others because of their inability to buy in bulk or travel to the cheapest shops. But perhaps the more fundamental problem is that there can be no guarantee that the prescribed minimum decent standard of living would be achieved on the poverty level of income — some of it might be diverted to alcohol, gambling, etc. Indeed there may be no level of income at which we can be sure that all families will have reached the prescribed living standard. I wonder if there is a satisfactory solution to this difficulty short of a major inquiry into the standards of living of low-income households. Such a survey might well be resented as intrusive. Of course, some allowance for gambling, etc. might be made by looking at the actual expenditure of low income families on these, as revealed by household expenditure survey data.

Faced with these difficulties in specifying what is a poverty level of income I, at least, cannot help thinking that there might be an easier way. Rather than trying to write down in detail the components of a decent but minimum standard of living, why not concentrate on those families whose living conditions are clearly unsatisfactory and try to understand why this happens? I need hardly add that a great deal of care needs to be taken in arguing from some particular situation to the general level of pension or benefit. Suppose one finds, for example, that the majority of applicants for emergency relief are sole parents and unemployment beneficiaries. Does this mean that the level of these benefits is inadequate? This is not necessarily true, for the problems of these groups may be due more to a sudden reduction in income than to the inadequacy of the benefit in the longer term. We are trying to gather data on these 'clearly inadequate' situations in our consultations on poverty, and assistance in the interpretation of these data.

Finally, I would like to mention a research proposal by Philippa Smith of ACOSS which, we hope, would throw a good deal of light on many of the problems I have been discussing during the last few minutes. I believe that such a study would be a most useful supplement to formal statistical analysis using data from the household expenditure survey. May I end this talk by expressing the hope that the ACOSS study would go ahead?

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