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Working Paper

Inequalities in the Economic Well-Being of Children and Adults in Ten Nations

LIS Working Paper Series, No. 19

Provided in Cooperation with:

Luxembourg Income Study (LIS)

Suggested Citation: Rainwater, Lee (1988) : Inequalities in the Economic Well-Being of Children and Adults in Ten Nations, LIS Working Paper Series, No. 19, Luxembourg Income Study (LIS), Luxembourg

This Version is available at:

<https://hdl.handle.net/10419/160691>

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Luxembourg Income Study Working Paper Series

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Inequalities in the Economic Well-Being of Children and
Adults in Ten Nations

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July 1988

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INEQUALITIES IN THE ECONOMIC WELL-BEING
OF CHILDREN AND ADULTS
IN TEN NATIONS.

by

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INEQUALITIES IN THE ECONOMIC WELL-BEING OF CHILDREN AND ADULTS IN TEN NATIONS

Introduction

Issues concerning the distribution of economic well-being are of the essence in social policy. While the concrete definitions of particular policy concerns do not always make this obvious, issues of distribution are almost always implicit in the more practical or operational concerns with matters of need, program adequacy, fairness, et cetera. Comparative social policy research has focused even more strongly on the question of the impact of social policy on the distribution of economic well-being.

Some studies seek to describe the full range of a nation's distribution of economic well-being or to compare the distributions in a number of different countries. More commonly, the focus is on particular objects of policy concern: persons with lower incomes. How lower income is defined varies enormously from study to study. There are conventional understandings in the policy cultures of different countries which define questions of low income or poverty in particular ways, e.g., poverty lines, equivalence scales.

Numerous writers have pointed out the confusion from the different ways of defining those who are to be the objects of social concern that results when one seeks to compare countries. Within any given country these matters tend to be settled administratively. Researchers use the implicit definitions of disadvantaged groups embodied in program regulations. So if one studies the poor in the United Kingdom one focuses on those with incomes at or below the Supplementary Benefits level. One might use the existence minimum (base amount) as a poverty line in Sweden. And in the United States effectively all research makes use of the U.S. official poverty line -- if it does not it is not considered "policy research". The U.S. poverty line has achieved for political reasons a status as practically unchallengeable. As Walter Korpi has noted, there is a particular unwillingness in the United States to see the problem of poverty as simply a specification of the general issue of income inequality. People close to political decision making in the United States are quite self-conscious about this. They regard poverty and inequality as two different issues. They believe that seeing poverty in the context of overall inequality raises enormous political difficulties.

However, there are numerous problems with such ad hoc procedures, if one wants to compare situations of economic well-being either across time or across countries. Any effort to look at the distribution of poverty or standards of living over decades that makes use of an absolute standard such as the U.S. poverty line rather quickly verges on the ridiculous.

Efforts to compare the extent of low-income or poverty across countries run up against the ad hoc quality of measures of the size of the population of social concern. It would hardly make sense (except in a study concerned with policy making per se) to compare the proportion of people in Sweden who have incomes less than the base amount with the proportion of people in the United Kingdom who have incomes below Supplementary Benefit level with the proportion in the United States whose incomes are below the official poverty line. The U.S. and the U.K. lines are about 40% of median income; the Swedish line is about 60% (around 1980). One wants a standard that is meaningful across countries.

Among many comparative social policy researchers there has been a broad acceptance of the notion of a relative poverty line. More generally one can say there has been acceptance of the idea that income (resource) inadequacy is a relative matter, relative that is to the standard of the average person in each society. As a general guide and as a theoretical orientation these arguments are compelling.

However, now that there is the possibility of doing systematic comparative research on the distribution of economic well-being among persons in a number of countries, it is necessary to develop ways of operationalizing this general position. Thus the opportunity for comparative social policy research which the Luxembourg Income Study (LIS) has opened up also poses a number of challenging questions of measurement method.

In this paper I will use an equivalence scale based on the so-called subjective approach to the measurement of standards of economic well-being to consider differences in the size of the low income population in the current ten LIS nations. Before presenting the findings, it will be useful to explore issues of equivalence and low income cutoffs.

The Luxembourg Income Study

LIS currently makes available to researchers in whatever country the possibility to work with a database of surveys of detailed income sources for families and households of some ten nations. (See table 1.) Under the sponsorship of the government of Luxembourg, LIS was begun as a cooperative endeavor of researchers of some seven countries in the summer of 1983. The purpose was to gather in one central location, the Center for Poverty, Population and Policy Studies (CEPS) in Walferdange, Luxembourg, sophisticated microdata sets which contain comprehensive measures of income and demographic and labor force characteristics for a set of industrialized countries. The data sets are housed on the Luxembourg government computers and subject to the strict data protection laws of Luxembourg. Thus it is possible to include in the database surveys from countries which do not ordinarily make public use data available to researchers. In addition to questions of data protection, the complexity of rendering surveys

Tableau 1 : Vue d'ensemble sur les fichiers du L.I.S.

| COUNTRY | DATASET NAME, INCOME YEAR (AND SIZE ¹) | POPULATION COVERAGE ³ | BASIS OF HOUSEHOLD SAMPLING FRAME ⁸ |
|-------------|---|-------------------------------------|--|
| Australia | <u>Income and Housing Survey,</u> 1981 - 82 (17'000) | 97.5 ⁴ | Dicennial Census |
| Canada | <u>Survey of Consumer Finances,</u> 1981 (37'900) | 97.5 ⁴ | Dicennial Census |
| Germany | <u>Transfer Survey,</u> 1981 ² (2'800) | 91.5 ⁷ | Electoral Register and Census |
| Israel | <u>Family Expenditure Survey,</u> 1979 (2'300) | 89.0 ⁵ | Electoral Register |
| Netherlands | <u>Survey of Income & Program Users</u> 1883 (4'833) | 99.2 ⁴ | Address Register of The Postal and Tele- phone Companies |
| Norway | <u>Norwegian Tax Files,</u> 1979 (10'400) | 98.5 ⁴ | Tax Records |
| Sweden | <u>Swedish Income Distribution</u> <u>Survey, 1981 (9'600)</u> | 98.0 ⁴ | Population Register |
| Switzerland | <u>Income and Wealth Survey,</u> 1982 (7'036) | 95.5 ⁹ | Electoral Register and Central Register for Foreigners |
| U.K. | <u>Family Expenditure,</u> ² 1979 (6'800) | 96.5 ⁶ | Electoral Register |
| U.S.A. | <u>Current Population Survey,</u> 1979 (65'000) | 97.5 ⁴ | Dicennial Census |

1 Dataset size is the number of actual household units surveyed.

2 The U.K. and German surveys collect subannual income data which is normalized to annual income levels.

3 As a percent of total national population.

4 Excludes institutionalized and homeless populations. Also some far northern rural residents (Inuits, Eskimos, Laps, etc.) may be undersampled.

5 Excludes rural population (those living in places of 2,000 or less), institutionalized, homeless, people in kibbutzum and guest workers.

6 Excludes those not on the Electoral Register, the homeless, and the institutionalized.

7 Excludes foreign-born heads of households, the institutionalized, and the homeless.

8 Sampling Frame indicates the overall base from which the relevant household population sample was drawn. Actual sample may be drawn on a stratified probability basis, e.g., by area or age.

9 Excludes nonresident foreigners, but includes foreign residents.

carried out in different ways comparable, and categorizing income sources which differ from country to country required a staff in a central place who, working with colleagues in each of the member countries, could provide expertise both in constructing the datasets and in assisting users.

Because of general support from funding agencies in most of the member countries, access to the LIS data are made available to researchers at no cost either through the mails or, more commonly and efficiently, EARN or other academic computer networks which link research centers around the world. Researchers use the EARN/BITNET network to send edited SPSSX data requests directly to Luxembourg where the technical staff reviews them, processes the data, and returns printout to the user over the network¹.

II. Defining Economic Well-being.

The effort to move from a conventional to a conceptually useful definition of economic well-being requires self-consciousness about several choices. Economic well-being refers to a ratio between income and need.

$$\text{Economic Well-being} = \text{Income/Need} \quad (1)$$

This is not a straightforward definition. What is income? Certainly one expects to count all money income received by the unit. But what about taxes? Is income net of taxes? A choice must be made. More consequentially, what about the non-cash economic resources that people receive, in particular the various social services, such as health care, education and the like. These certainly contribute to economic well-being. It is important to capture variations across countries in the degree to which and the terms under which citizens receive such services if one wants to do the best job of comparison. One could imagine a broader and broader range of these noncash resources being taken into account. Thus, at some point one would move imperceptibly from a concern with economic resources to a concern with the broader issue of levels of living (Erikson and Aberg, 1987, Ringen, 1987). Even remaining very much within the economic framework, the issue of non-cash resources is an important one. In the LIS project we have undertaken to develop imputations of non-cash income for the LIS countries (Smeeding et al, 1988). However, this work has

¹Communications can be addressed to LIS research staff: username = SSLISBB, node = LUXCEP11, or the author: LR at HARVUNXT or the LIS executive director, Timothy Smeeding, who is at SMEEDITM at VUCTRVAX. A LIS user package is available, including documentation of the datasets and a sample data file containing random samples of about 200 records from each country. The sample is used to test data runs on the home computer before the instructions for the computer runs are forwarded to Luxembourg.

not progressed far enough for the results to be used at this time. Therefore this paper confines itself to a measure of economic well-being that includes only cash income and what may be called near-cash income--such as housing allowances, rent and rate rebates, or food stamps. There are some thirty-six income sources of cash and near-cash income in the LIS database.

For this paper I have chosen to use after-tax income, since this seems the best measure of the money resources that are available to individuals.

Although there are quite a number of complexities to the simple idea of income in (1) above, these are nothing compared to the complexities introduced by taking need into account. If we ignore need, then we can simply look at the distribution of disposable income. This is of interest, but it is not enough both because we all assume that families differ in the extent of their income need and that any effort to characterize their well-being has to take this into account and because governments transfer income on the basis of family size.

There is also the important question of the unit whose economic well-being we are characterizing with this calculation. Conventionally, in research on income distribution the unit is the family. It is assumed that people living together share their economic resources in some way that they find mutually tolerable².

In addition to the conceptual and substantive issues associated with the question of intrafamily distribution, there is a very practical issue having to do with differences in the way surveys are carried out in different countries. In some countries the only unit available from the dataset is a unit smaller than the family -- a tax unit. Thus families that contain more than one tax unit -- for example, a couple whose twenty-year-old child lives with them -- are represented in the sample as two families because they are two tax units. This means that if in fact the family pools its resources from both of these tax units in their normal day-to-day life and both tax units have income, we are usually underestimating the economic well-being of the individuals in the tax unit. There is nothing that one can do about this problem given the survey practices of the different countries. It is reassuring to know that the number of cases in which there are multiple tax units within families is relatively small.

²Of course it is assumed in many economic models that there is sharing within the family in terms of need because the utility of each person in the family is equally valuable to all of the members. This is an unsustainable assumption, but it avoids a lot of difficulties. We are left with a kind of as-if stance--because we don't know how resources are shared within the family, we carry out our analysis as if they were shared equally in terms of the needs of each member.

Exploring the Question of Need

The principal way need is handled in policy studies involves an adjustment for family size. Unfortunately for the researcher, the nature of this adjustment varies enormously from study to study. Even when there is consensus within countries as to how this adjustment is to be made, the differences among countries are very great. We have surveyed as many family size equivalent scales as we have been able to find. The results of that survey are summarized in Appendix A. Most equivalent scales can be approximated quite closely by the following model:

$$\text{LN(Need)} = \text{LN(Family Size)} * s \quad (2)$$

The power, s , determines the rate at which need is judged to increase with family size. If there were no adjustment ($s=0$) then need would be 1 for every family and economic well-being would be simply a function of disposable income. At the other extreme if $s=1$ then each increment to family size increases need proportionally; economic well-being is equal to per capita disposable income. The range of s between 0 and 1 is pretty well represented by existing equivalence scales, as is apparent from the table in Appendix A. There simply is no straightforward way to say what the right equivalence scale is.

One can, however, argue about the plausibility of equivalence scales. We have identified four kinds of equivalence scales which seem to be systematically different, one from the other. Most of the equivalence scales actually in use by policy makers have been developed by experts. They are seldom based on systematic empirical research, but rather represent some judgement, often informed by examining data on expenditures, by experts as to what families of different size need. The scales most often used in social programs -- for example the scale implicit in the existence minimum in Sweden, or the supplementary benefits scale in the U.K., or the Swiss social assistance scale or the American poverty line, hover around an s of .55. Thus if one wanted to come as close as possible to a consensus equivalence scale that represented how most countries calculate need, a scale with $s = .55$ would be a good choice. (See Appendix A for more detail.)

However, there is considerable evidence to suggest these expert scales overestimate quite a bit the increments in need from additional family members. Studies by economists that model consumer behavior using consumer expenditure surveys in order to develop implicit equivalence scales seldom find values of s as high as .55.

Furthermore, if one admits that the level of economic well-being individuals enjoy has to be understood as relative to that of others in their society it seems reasonable also to believe that the question of equivalence is essentially a matter of social judgement and that the best experts on family size equivalence are individuals in the society all of whom have implicit conceptions of how much it takes for a large or small family to live at a given level.

These conceptions can be measured in a number of different ways. One can ask how much income is necessary for families of given sizes to be comfortable or to get along or to just escape poverty. Or, by an approach that seems somewhat more powerful because it is less direct, one can ask individuals how much income their family needs. By regression analysis one discovers the coefficient attached to family size.

Both of these approaches have been used and they result in equivalences which are markedly lower than either the expert equivalences or consumer expenditure equivalences (although there is overlap between the consumer equivalences and the subjective equivalences). These results suggest that in their own thinking about their economic well-being individuals do not perceive larger units as needing nearly as much more than smaller units as the experts who establish official equivalence scales do. The results are highly consistent in this respect, although, as is apparent from Appendix Table 1, there are differences from sample to sample³.

One can draw two lessons from this exploration of equivalence scales. One is that it may be useful for some purposes to see how much difference using different equivalence scales makes to whatever comparisons of economic well-being one is interested in. The other is that one should take seriously the choice of an equivalence scale and seek to choose one which on theoretical grounds is appropriate.

I have suggested that I think the subjective scales are appropriate on theoretical grounds if one's approach to economic well-being is social, that is, derived from theories concerning the importance of relative social position for persons' understandings of their own and others' well-being.

Need and Age

In addition to the size of the family unit, equivalence scales also sometimes take into account other characteristics of the family members, in particular the age of the head or the age of children. There seems to be even less consensus across experts and across countries about whether this should be done than there is with respect to family size.

Unfortunately in the subjective studies there has not been the possibility to explore very fully the role of the age of children. A

³I would hesitate to say that there are differences from country to country since we have only one Eurobarometer survey carried out in the European Community, and it was done in such a way that it is difficult to accord a great deal of precision to the survey estimates.

first effort suggests that age of children in the family does not have a significant effect on how much income people believe they need.

On the other hand, there is very solid evidence that the age of the head of the family does affect people's assessment of need. Although the coefficients vary slightly for different surveys, the shape of the relationship is quite consistent. Need is perceived to increase with the age of the head of the household to around age 45 and to decrease after that. The rates of increase and decrease seem to be similar although for the surveys I have worked with most intensively (1979, 1981, 1982 and 1983 Gallup surveys asking how much your family needs to get along) there is a consistent indication that need decreases slightly faster after age 45 than it increases until that point. The same relationship of need to age holds for the Eurobarometer survey.

A reasonable choice here would be to say that need increases 0.8% each year up to head's age of 45 and decreases at about the same rate after that.

This age adjustment means that, compared to the average of all non-elderly, those over 65 need about 10% less. This is about the same age adjustment that is involved in the U.S. poverty line. The difference is that this adjustment is made across all ages in an incremental way, whereas the poverty line assumes no difference in need for households headed by persons under 65 and a sudden drop of 10% on reaching age 65. If there is an age effect one would expect it to operate in an incremental fashion, rather than an all-or-none fashion.

Given these results for the effect of size and age of head on need, I propose the following definition of economic well-being (EWB):

$$\text{LN(EWB)} = \text{LN}(\text{income}) / ((\text{LN}(\text{family size}) * 0.25) + (\text{LN}(.992) * (45 - \text{age}))) \quad (3)$$

This says that need is seen as increasing as a 0.25 power of family size, and decreasing at a compound rate of 0.8% a year for the number of years distance of head's age from age 45.

To make these numbers more concrete we can say that as family size increases from one to five need increases by the following ratios: 1.00, 1.19, 1.32, 1.41, 1.50. For the ages 25, 35, 55, and 65, need for any given family size would be the following percentage of the need of the same family headed by a 45-year-old: 85%, 92%, 92%, 85%.

It may be of interest to see how much difference taking the age of head into account makes. Table 2 shows the poverty rate that we would find with and without the age adjustment, if poverty were defined as 50% of the median well-being and family size equivalence (s) had a value of 0.25.

It is necessary to appreciate what is implied by the notion of poverty as 50% (or some other percentage) of median well-being. First one

calculates well-being for each country according to (2) above. Then one calculates its median. Any change in the way one calculates well-being will produce a change in the median. If one phrases levels of well-being as some proportion of the median changing need definitions will have the effect of changing the well-being cutoffs.

Without the adjustment for age of head we find the distribution shown in the first column of Table 2, with the countries ranged from the lowest poverty rate to the highest. Here we are counting all persons in the families. We find the range from 7.3% poor in the Netherlands to 17.9% in the United States. When we adjust for age, we find that all of the poverty rates are lower, as would be expected. Since income in fact increases and decreases exactly as our age adjustment does, adjusting for age means that younger people and older people will have higher well-being relative to middle-aged people than if no adjustment is made, and therefore fewer of them will be below any poverty line cutoff. Thus the choice to adjust for age is also a choice which assumes that people's perception of their own economic well-being and of that of others takes into account their ages in such a way that at a given income they will feel greater economic well-being at younger ages and at older ages than they will in the middle.

Table 2

Effect of Age Adjustment for Need
on The Poverty Rate

| | No Adjust ment | Age Adjusted | Percent Reduction in Poverty |
|----------------|----------------------|-----------------|------------------------------------|
| Australia | 16.0 | 13.3 | 16.9 |
| Canada | 15.0 | 13.3 | 11.3 |
| Germany | 7.6 | 5.9 | 22.4 |
| Israel | 12.0 | 10.2 | 15.0 |
| Netherlands | 7.3 | 6.7 | 8.2 |
| Norway | 10.3 | 7.9 | 23.3 |
| Sweden | 7.9 | 5.9 | 25.3 |
| Switzerland | 10.5 | 8.9 | 15.2 |
| United Kingdom | 15.2 | 12.4 | 18.4 |
| United States | 17.9 | 16.6 | 7.3 |

We do note, however, that the changes as a result of this adjustment are greater in some countries than others. In the Netherlands and the United States the effect is the smallest. In Germany, Sweden, and Norway, there are over 20% fewer poor people once we adjust for age than there were before.

The effect of the age adjustment on the poverty rate of those over age 60 of course is much greater than for the population as a whole. Thus we find that the proportion of Swedish old people defined as poor is

reduced by 54%, the proportion of Australian old people by 38%, of German old people by 32%; in most of the rest of the countries the reduction is in the 20% range.

Obviously how much effect the age adjustment has depends on the degree of concentration of older people's incomes around the poverty line. If there are many old people just below the poverty line when there is no age adjustment then many of them will be shifted out of poverty when both the median and their own incomes are adjusted for their lesser need. In countries where the old poor are poorer this adjustment range will move fewer of them above the new age-adjusted poverty line.

There remains the question of how to organize the distribution of well-being in such a way as to learn the most from an exploration. There are, of course, many different kinds of summary inequality measures, but their shortcoming is exactly that: they summarize details we want to know about. Their other problem is that for most policy questions the focus is too broad. Most of the time we really are not interested in the distribution above the median, but we want to know a good deal about the distribution below the median. Defining the poverty line is a simple way to focus on groups of greatest concern: those with very low income. But there is always the suspicion that if one chose a different poverty line, somehow the pattern of findings across countries or family types or whatever would look different. One of the advantages of working with microdata like the LIS data bank is that one does not have to make once-and-for-all choices. The cost, in terms of time and thought, of looking at the data from different perspectives, is much lower than is normally the case.

One way to characterize the distribution of interest, that is the distribution of the 50% of the population below the median, is to calculate a standard deviation as if the observed distribution below the median were half of a perfectly symmetrical distribution. Then we have a summary measure of the variance below the median that is not affected by the nature of the deviance above the median. Separating the two is important since it is the case, for example, that differences among nations in the proportion of individuals of high income (say, above one and a half times the median) are not highly correlated with differences among nations in the proportion of the population below half the median.

But while such a summary measure of the relevant inequality is useful to begin an exploration one will still be interested in the nuances of the distribution, and in the concrete numbers of people who are at this, that, or the other point of the distribution.

Children, Working Age Adults and The Elderly

Table 3 presents the distribution of persons in ten countries of the LIS database in terms of various levels of equivalent income below the

median. The tables show cumulative percentages below 40% 50%, 60%, 70% and 100% of median income. The median is for all persons in the sample; any particular group (e. g., all children) may have more or fewer of 50% of their number below the median. (Also see Figures 1-3.)

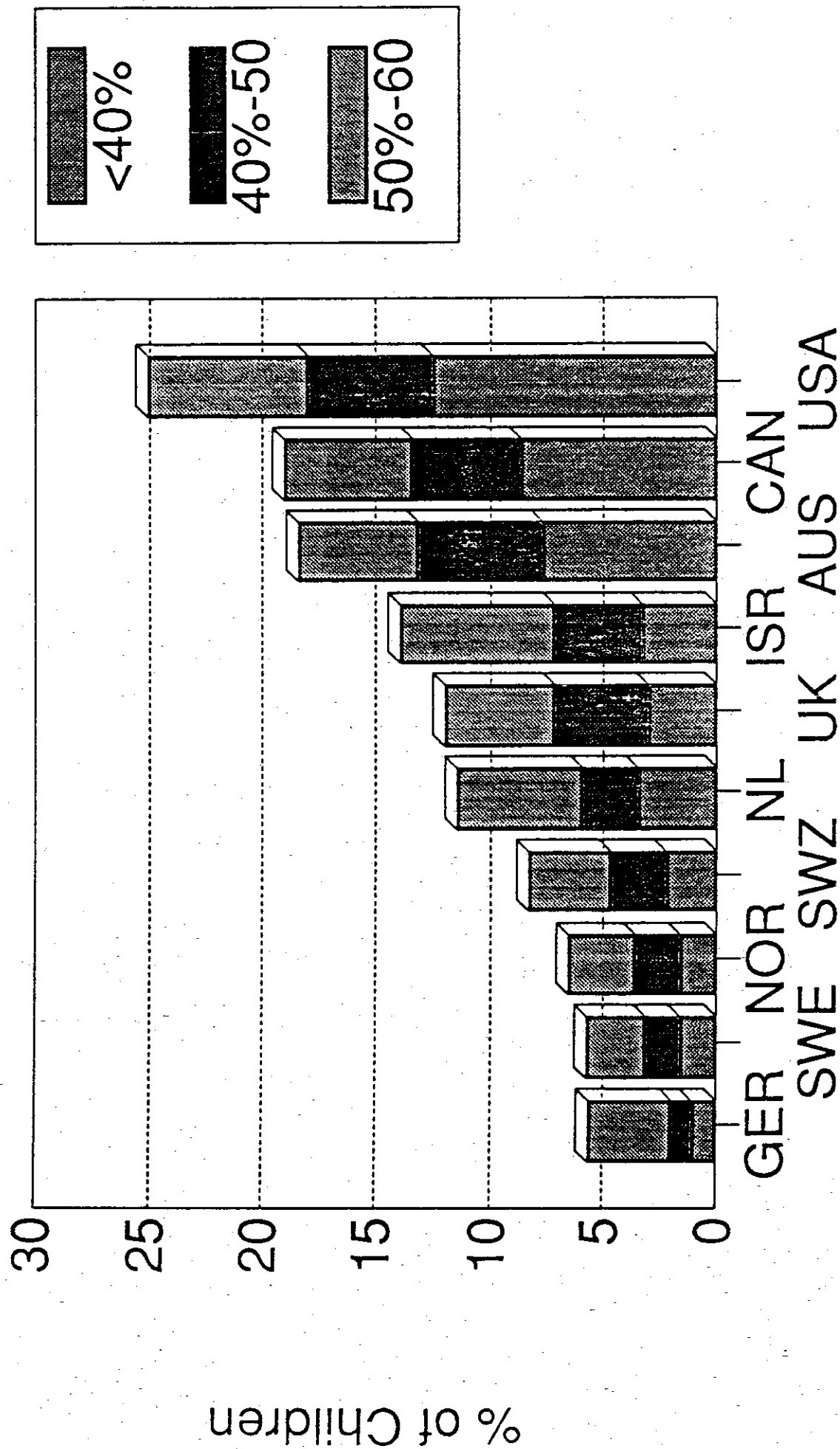
If we want to take the by now conventional relative poverty line of 50% of the median as our standard, we can compare the proportion of children, of working-age adults, and of older adults who are poor by this standard. We find the range for children is from 2% in Germany to 18% in the United States. For adults up to the age of 59, whom we call working age, we find that the range is between 4.2% in Germany and 13.3% in the United States. For older people we find the range is between 4.2% in the Netherlands and 38% in the United Kingdom.

This way of working with the data, although it produces quite a few more numbers than one would with a single poverty line, gives one an opportunity to explore in a fine-grained way the nature of the distribution of economic well-being for those whose level is below the median. And it also allows us to explore the question of how adopting different poverty lines affects the perspective on low income. As noted above if one compares the ratio of national poverty lines to the median, one finds important variations from country to country. For example, the existence minimum for Sweden stands at about 60% of the median well-being for Sweden whereas the U.S. poverty line and the U.K. Supplementary Benefits line stand at about 40% of their respective median equivalent incomes. If we had more of this kind of information we would be able to compare countries in terms of the relative generosity of their poverty lines.

PERCENT OF CHILDREN IN POVERTY

FIGURE 1

(at three levels of poverty)



% OF ADULTS AGE 60 AND OVER IN POVERTY

FIGURE 3

(at three levels of poverty)

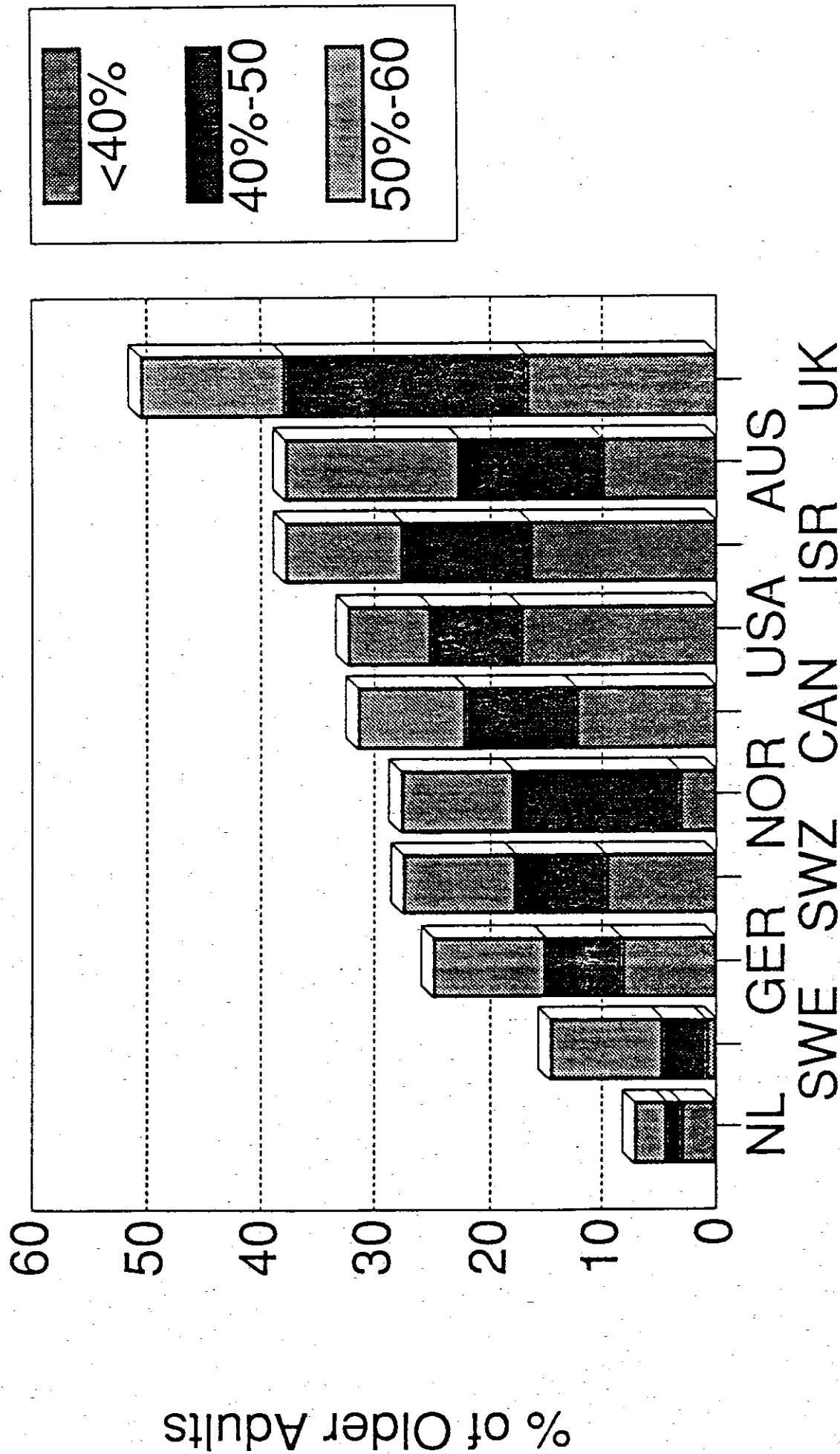


Table 3

Cumulative Percent of Children, Working Age and Older Adult
Below 40%, 50%, 60%, 70% and 100% of the Median Economic
Well-Being of All Persons by Country

| | AUS | CAN | GER | ISR | NL | NOR | SWE | SWZ | UK | USA | MEAN |
|--------------|------|------|------|------|------|------|------|------|------|------|------|
| Children: | | | | | | | | | | | |
| < 40% | 7.6 | 8.6 | 1.0 | 3.3 | 3.4 | 1.6 | 1.6 | 2.2 | 3.0 | 12.6 | 4.5 |
| < 50% | 13.1 | 13.4 | 2.0 | 7.1 | 5.9 | 3.5 | 3.1 | 4.6 | 7.1 | 18.0 | 7.8 |
| < 60% | 18.4 | 19.0 | 5.6 | 14.0 | 11.5 | 6.5 | 5.7 | 8.3 | 12.0 | 25.1 | 12.6 |
| < 70% | 25.3 | 26.2 | 15.0 | 23.9 | 21.9 | 11.6 | 9.5 | 13.2 | 19.9 | 31.6 | 19.8 |
| < 100% | 55.0 | 54.7 | 51.1 | 52.2 | 57.4 | 45.7 | 34.9 | 49.7 | 50.9 | 54.6 | 50.6 |
| Working Age: | | | | | | | | | | | |
| < 40% | 6.8 | 7.2 | 2.4 | 3.9 | 5.9 | 3.6 | 4.8 | 8.5 | 3.0 | 9.3 | 5.5 |
| < 50% | 10.5 | 11.0 | 4.2 | 6.9 | 8.1 | 6.0 | 7.8 | 10.7 | 5.5 | 13.3 | 8.4 |
| < 60% | 14.4 | 15.6 | 7.2 | 13.1 | 11.4 | 8.8 | 11.5 | 13.7 | 9.4 | 18.3 | 12.3 |
| < 70% | 19.4 | 21.1 | 14.1 | 20.4 | 18.7 | 13.0 | 17.3 | 18.8 | 15.2 | 23.9 | 18.2 |
| < 100% | 42.5 | 44.6 | 44.2 | 43.0 | 45.4 | 44.8 | 46.8 | 48.0 | 39.5 | 44.4 | 44.3 |
| Older: | | | | | | | | | | | |
| < 40% | 9.9 | 12.2 | 8.1 | 16.4 | 2.9 | 3.2 | 0.8 | 9.5 | 16.6 | 17.2 | 9.7 |
| < 50% | 22.5 | 22.1 | 15.0 | 27.6 | 4.2 | 17.8 | 4.6 | 17.5 | 38.0 | 25.1 | 19.4 |
| < 60% | 38.0 | 31.4 | 25.0 | 37.9 | 7.1 | 27.8 | 14.6 | 27.6 | 50.6 | 32.4 | 29.2 |
| < 70% | 48.6 | 40.9 | 35.1 | 46.1 | 14.2 | 41.5 | 27.8 | 38.6 | 59.1 | 40.0 | 39.2 |
| < 100% | 66.0 | 61.6 | 63.8 | 64.8 | 53.7 | 67.3 | 71.0 | 62.4 | 76.3 | 60.4 | 64.7 |

Distribution of Sample:

| | | | | | | | | | | |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Children | 30.2 | 28.4 | 23.1 | 37.9 | 26.1 | 37.6 | 22.6 | 25.5 | 28.3 | 29.1 |
| Working Age | 54.4 | 56.7 | 55.9 | 46.6 | 57.2 | 43.4 | 53.5 | 54.7 | 52.0 | 54.3 |
| Older | 15.4 | 14.9 | 21.0 | 15.5 | 16.7 | 19.0 | 23.9 | 19.8 | 19.8 | 16.6 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Author's Tabulation from LIS Database. Economic well-being is
aftertax family income adjusted for family size ($s=.25$) and age
($a=-.01$) as explained in the text.

If one thinks of a poverty line as designed to count people in relatively extreme distress then a poverty line at 50% or 40% of the median seems quite reasonable. If one has a more generous conception of the exercise -- that the purpose of the poverty line is to draw attention to the persons in society who should be objects of social concern then a line at 60% or 70% of the median would be reasonable. In most of what follows when to simplify a presentation I have to choose a single poverty line I choose 60%.

One can observe that the differences among countries are greatest at the lower poverty lines, as indicated by the coefficient of variation in the last column of Table 3. The higher the line the lower the coefficient of variation. This is necessarily so since for all

persons the variance of the 100% point is by definition 0, because 50% of the people in each country are below the median.

There are some fairly dramatic findings here. Almost two-thirds of Swedish children live in households with above-median economic well-being while in almost all the other countries the majority of children live in households below median economic well-being. At this point we need to remember that we are using an equivalence scale that says that children do not cost very much. Even so, children compared to all other persons appear disproportionately in the lower half of the distribution.

But not, however, in the lowest part of the distribution. Older people are even more likely to be in this situation. In no country do half of the elderly have above-median levels of economic well-being. In general the elderly are twice as likely to be poor as are the children. Only in the Netherlands and Sweden are the numbers of poor children and elderly both at very low levels.

One can identify four clusters of countries by examining the patterns of poverty rates of children and the elderly. Australia, Canada, and the United States have high levels of low income children and older persons. Sweden and the Netherlands have quite low proportions of both groups who are low income. Germany, Switzerland, and Norway have very low proportions of low income old people. Israel is around average on the proportion of poor children but somewhat above average for older people. The U.K. has average poverty for children but a very high rate for old people.

Low Income Children

When one examines variations in the economic well-being of children by family types, one finds that the patterns across countries are not quite the same. (See Table 4 and Figures 4-6). In all countries children of solo mothers are much more likely to have low income than are children who live in two-parent families. For the most part children of solo parents are somewhere between three-and-a-half and five times more likely to be poor than children of two-parent families.

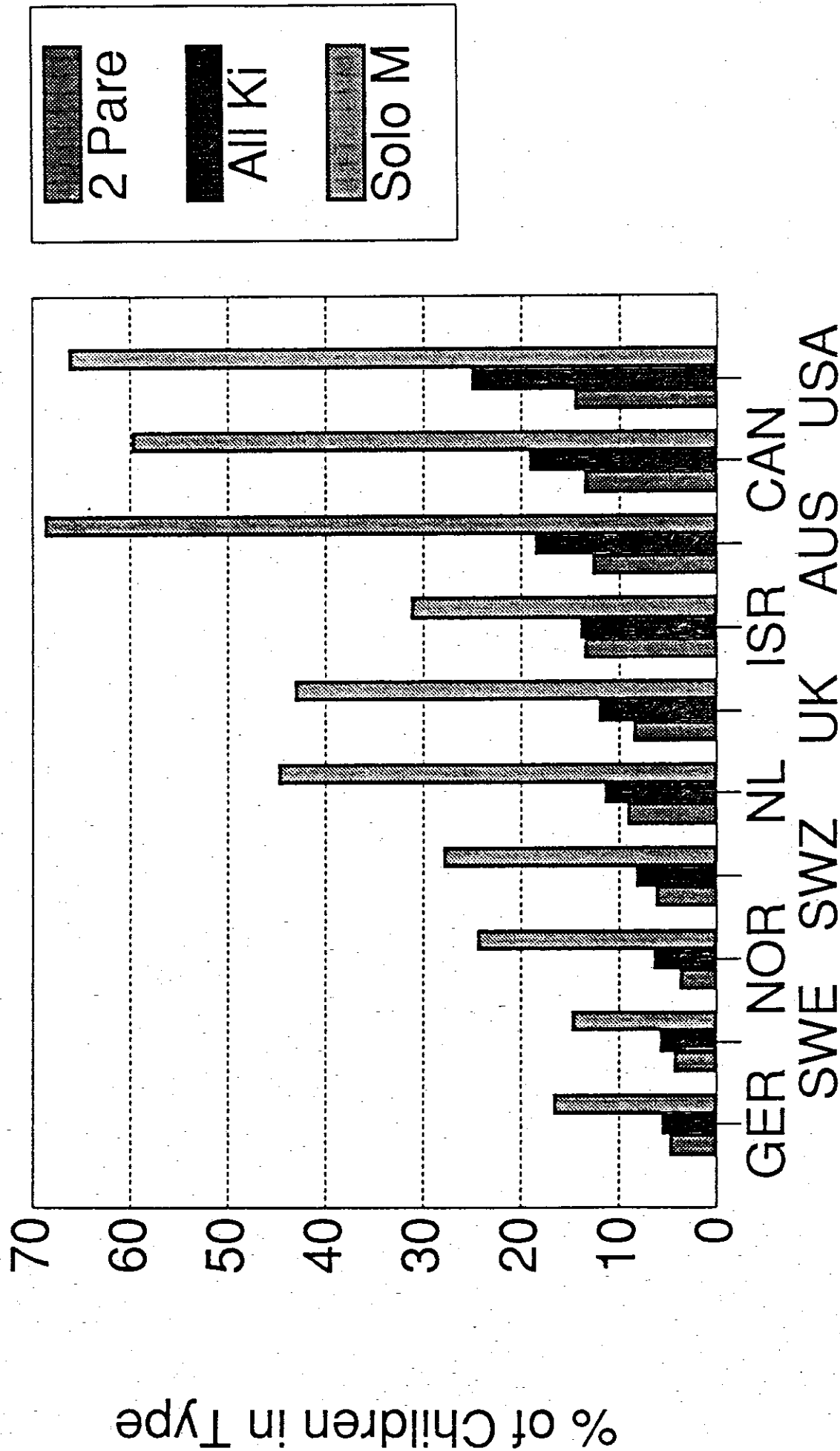
The difference in levels, however, is striking. Children in Swedish or German solo parent families are about as likely to be poor as children in American two-parent families. The absolute difference in Sweden between single-parent and two-parent families is about 10%, whereas in the United States it is over 50%, as it is in Australia, and Canada comes very close. While it is true that in Sweden only 20% of the children of solo parents have above-median equivalent incomes, 74% of them have incomes above 70% of the median, compared to only 25% in the United States, 22% in Australia, and 30% in Canada.

As implied earlier, children in two-parent families in Sweden tend to be in the upper half of the distribution of economic well-being--73%

% OF KIDS IN POVERTY BY FAMILY TYPE

FIGURE 4

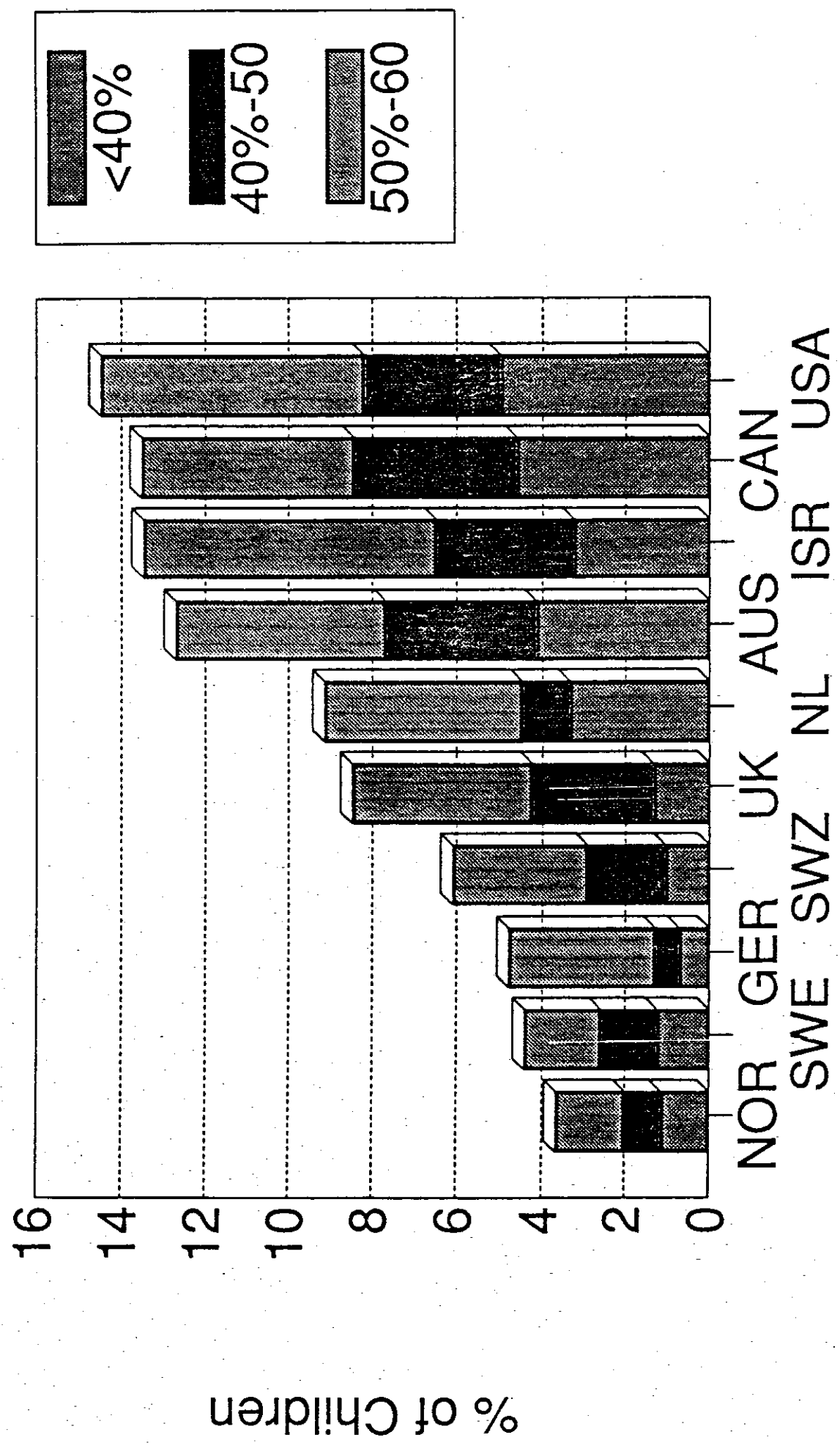
(Poverty = < 60% of Median Well-Being)



% OF KIDS OF TWO PARENTS IN POVERTY

FIGURE 5

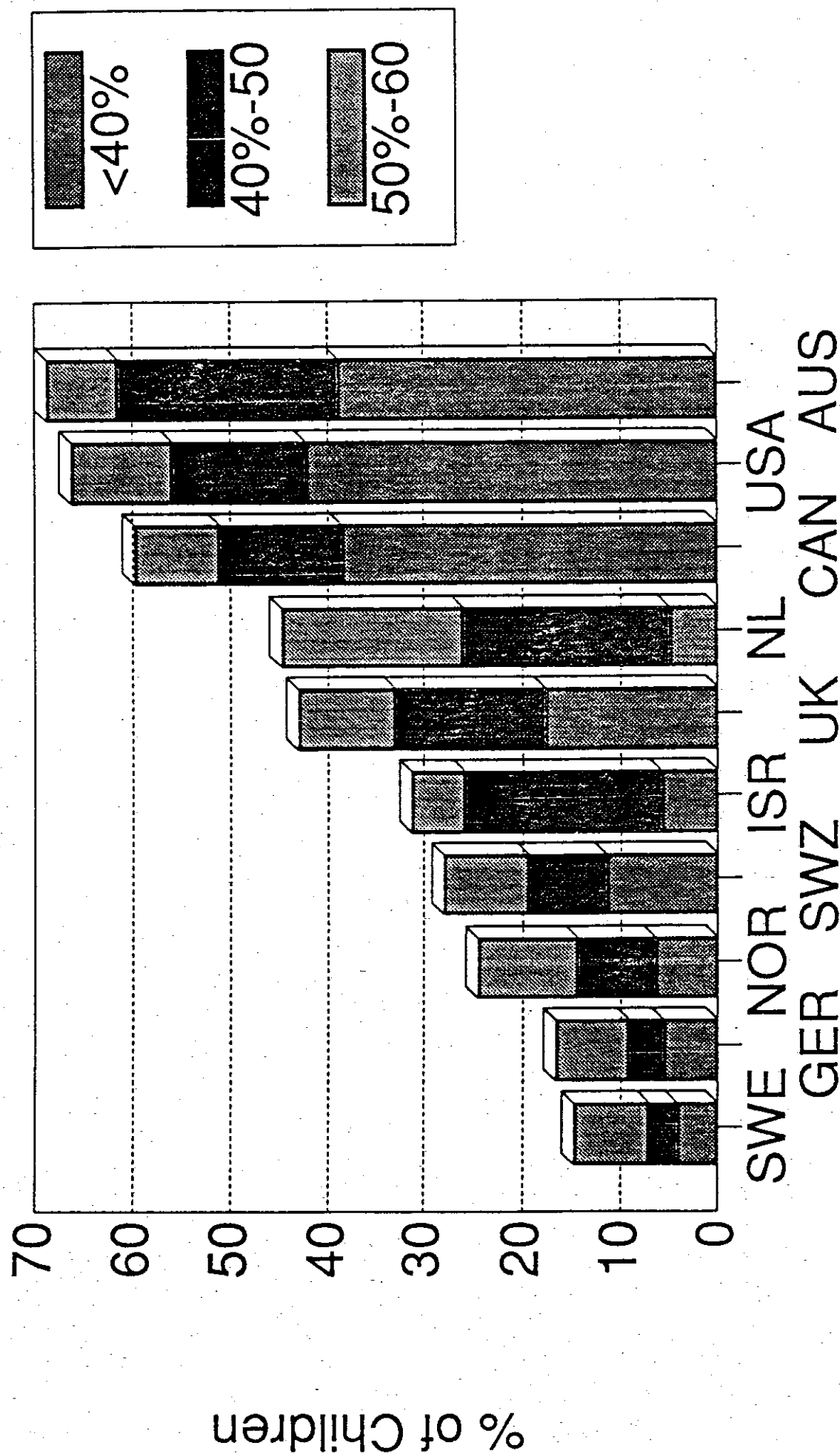
(at three levels of poverty)



% OF KIDS OF SOLO MOTHERS IN POVERTY

FIGURE 6

(at three levels of poverty)



of them have above median levels of economic well-being compared to around 50% in most of the other countries. But even in two-parent families we find poverty rates in the 13 to 15% range for Australia, Canada, Israel, and the United States, whereas we find rates below 5% in Germany, Norway, and Sweden.

Table 4

Cumulative Percent of Children in Two Parent and Solo Parent Families Below 40%, 50%, 60%, 70% and 100% of the Median Economic Well-Being of All Persons by Country

| | AUS | CAN | GER | ISR | NL | NOR | SWE | SWZ | UK | USA | MEAN |
|--------------|------|------|------|------|------|------|------|------|------|------|------|
| Two Parent: | | | | | | | | | | | |
| < 40% | 4.1 | 4.6 | 0.7 | 3.2 | 3.3 | 1.1 | 1.2 | 1.1 | 1.3 | 5.0 | 2.6 |
| < 50% | 7.7 | 8.4 | 1.3 | 6.5 | 4.5 | 2.0 | 2.5 | 2.9 | 4.2 | 8.2 | 4.8 |
| < 60% | 12.7 | 13.6 | 4.8 | 13.5 | 9.2 | 3.6 | 4.4 | 6.1 | 8.5 | 14.5 | 9.1 |
| < 70% | 19.3 | 20.4 | 14.2 | 22.9 | 19.0 | 7.4 | 7.1 | 10.7 | 15.7 | 20.4 | 15.7 |
| < 100% | 50.8 | 50.1 | 50.3 | 51.3 | 56.1 | 41.6 | 27.4 | 47.3 | 48.3 | 45.4 | 46.8 |
| Solo Mother: | | | | | | | | | | | |
| < 40% | 39.1 | 38.5 | 5.5 | 5.7 | 4.9 | 6.5 | 4.1 | 11.4 | 17.6 | 42.4 | 17.6 |
| < 50% | 61.6 | 51.2 | 9.0 | 25.7 | 26.0 | 14.4 | 6.9 | 19.3 | 33.0 | 56.0 | 30.3 |
| < 60% | 68.9 | 59.9 | 16.6 | 31.4 | 44.9 | 24.5 | 14.6 | 28.1 | 43.3 | 66.2 | 39.8 |
| < 70% | 77.5 | 69.6 | 27.9 | 57.1 | 64.5 | 39.6 | 26.0 | 36.8 | 57.0 | 74.7 | 53.1 |
| < 100% | 90.5 | 89.9 | 68.4 | 80.0 | 77.7 | 77.7 | 80.1 | 70.2 | 75.4 | 90.5 | 80.0 |

For children in solo mother families, two kinds of income are important for keeping the family out of poverty. We observe that some 90% of children in American solo mother families would have been poor without the earnings of their mother but then so would almost 80% of Swedish, Norwegian, and Swiss children of solo mothers have been

poor if they did not have a mother's earnings. In seven of these ten countries the lack of mothers' earnings would have produced more poor children than would the lack of social transfers (see Table 5 and Figures 7-9).

Table 5

Percent of Children, in Two Parent and Solo Mother Families Who Would Have Been Below a Given Level without Social Transfers Who Are Moved Above That Level By Social Transfers

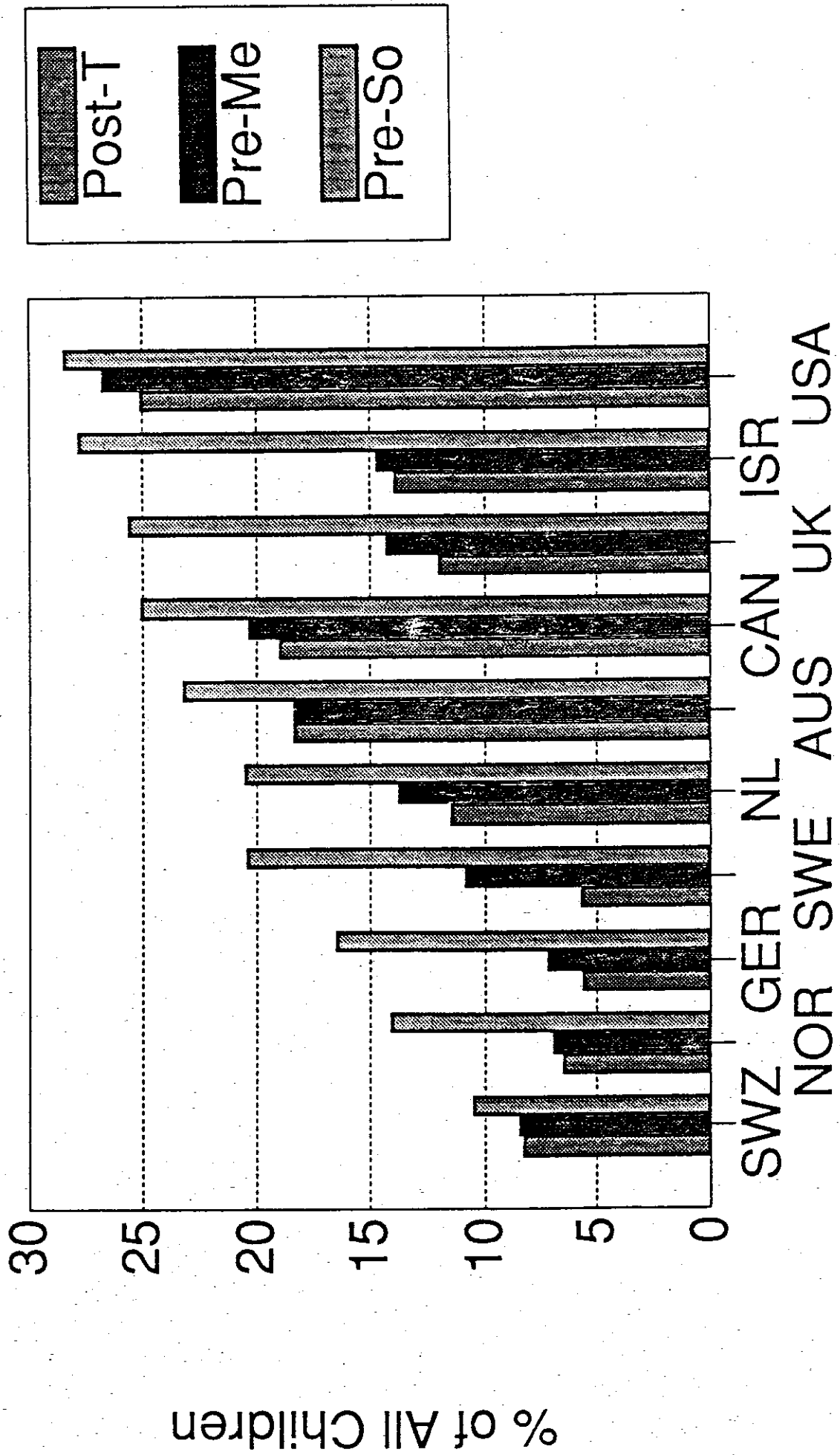
| | AUS | CAN | GER | ISR | NL | NOR | SWE | SWZ | UK | USA | MEAN |
|--------------|------|------|------|------|------|------|------|------|------|------|------|
| Two Parent: | | | | | | | | | | | |
| < 40% | 53.9 | 50.3 | 77.1 | 68.3 | 71.3 | 65.1 | 78.4 | 48.3 | 80.8 | 38.6 | 63.2 |
| < 50% | 36.4 | 40.0 | 80.7 | 62.5 | 64.6 | 60.4 | 69.5 | 24.2 | 64.7 | 27.4 | 53.0 |
| < 60% | 24.5 | 29.7 | 67.0 | 48.9 | 42.2 | 53.1 | 68.5 | 14.0 | 60.0 | 15.7 | 42.4 |
| < 70% | 18.4 | 24.4 | 44.2 | 37.7 | 22.5 | 44.1 | 68.4 | 10.2 | 52.5 | 12.6 | 33.5 |
| < 100% | 8.5 | 10.5 | 16.7 | 14.7 | 6.6 | 13.6 | 46.8 | 2.0 | 26.7 | 6.1 | 15.2 |
| Solo Mother: | | | | | | | | | | | |
| < 40% | 43.0 | 27.6 | 82.5 | 88.9 | 93.9 | 85.8 | 89.2 | 48.0 | 62.4 | 27.5 | 64.9 |
| < 50% | 16.1 | 17.2 | 76.2 | 64.0 | 69.0 | 71.6 | 86.5 | 37.1 | 41.9 | 15.5 | 49.5 |
| < 60% | 13.0 | 12.8 | 66.5 | 59.3 | 46.9 | 56.2 | 76.4 | 31.9 | 33.8 | 8.5 | 40.5 |
| < 70% | 7.0 | 9.6 | 54.3 | 25.9 | 26.7 | 35.0 | 67.5 | 22.2 | 20.4 | 5.0 | 27.4 |
| < 100% | 3.8 | 2.8 | 15.4 | 20.0 | 17.0 | 12.8 | 18.3 | 2.4 | 12.4 | 2.1 | 10.7 |

Nevertheless social transfers are essential to moving a great many solo mothers out of poverty. This is of course the case for all family types. Table 6 describes the role of social transfers by showing the proportion of children, working age and older adults who would have been below an equivalent income level without transfers, who were moved above that level by transfers. Thus we find for all children in Sweden, 84% of those who would have been below the 40% level are moved above it by transfers, as are 78% of those who would have been below the 50% level, and 72% of those who would have been below the 60% level. These high figures for children (and adults and elderly too) generally apply in the case of Germany, Israel, the Netherlands, Norway, Sweden, and the United Kingdom (although less so in the latter case for the elderly). On the other hand the United States in particular, but followed by Canada and Australia, moved far fewer people at any given low income level above the level with transfers.

% OF POOR KIDS PRE- AND POST-TRANSFER

FIGURE 7

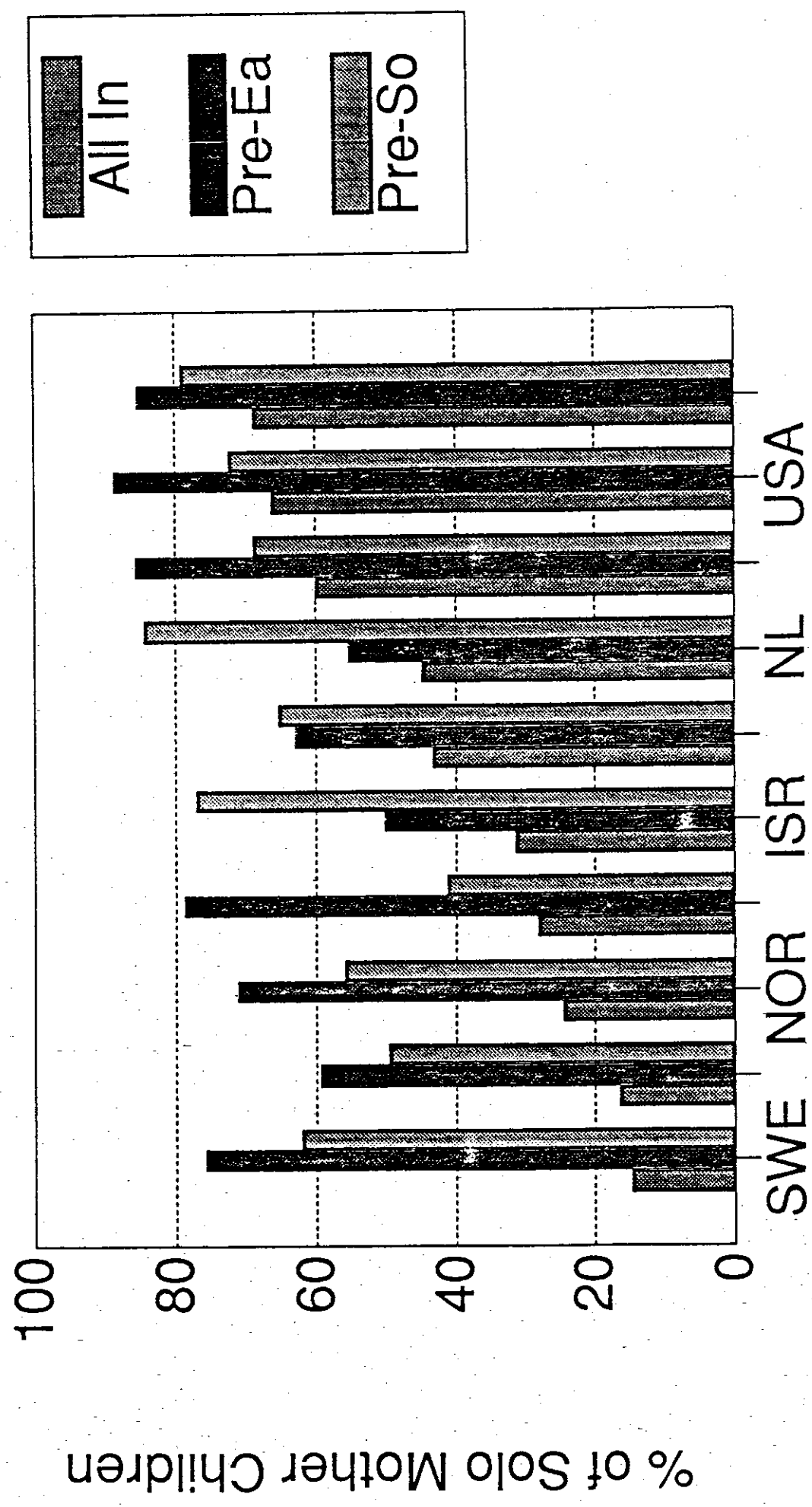
(Poverty = < 60% of Median Well-Being)



EFFECT OF MOTHER'S EARNINGS & TRANSFERS

FIGURE 8

ON POVERTY RATE OF SOLO MOTHER'S KIDS



(Poverty = $\geq 60\%$ of Median Well-Born)

PRE- AND POST-TRANSFER POVERTY AMONG

FIGURE 9

CHILDREN IN SOLO PARENT FAMILIES

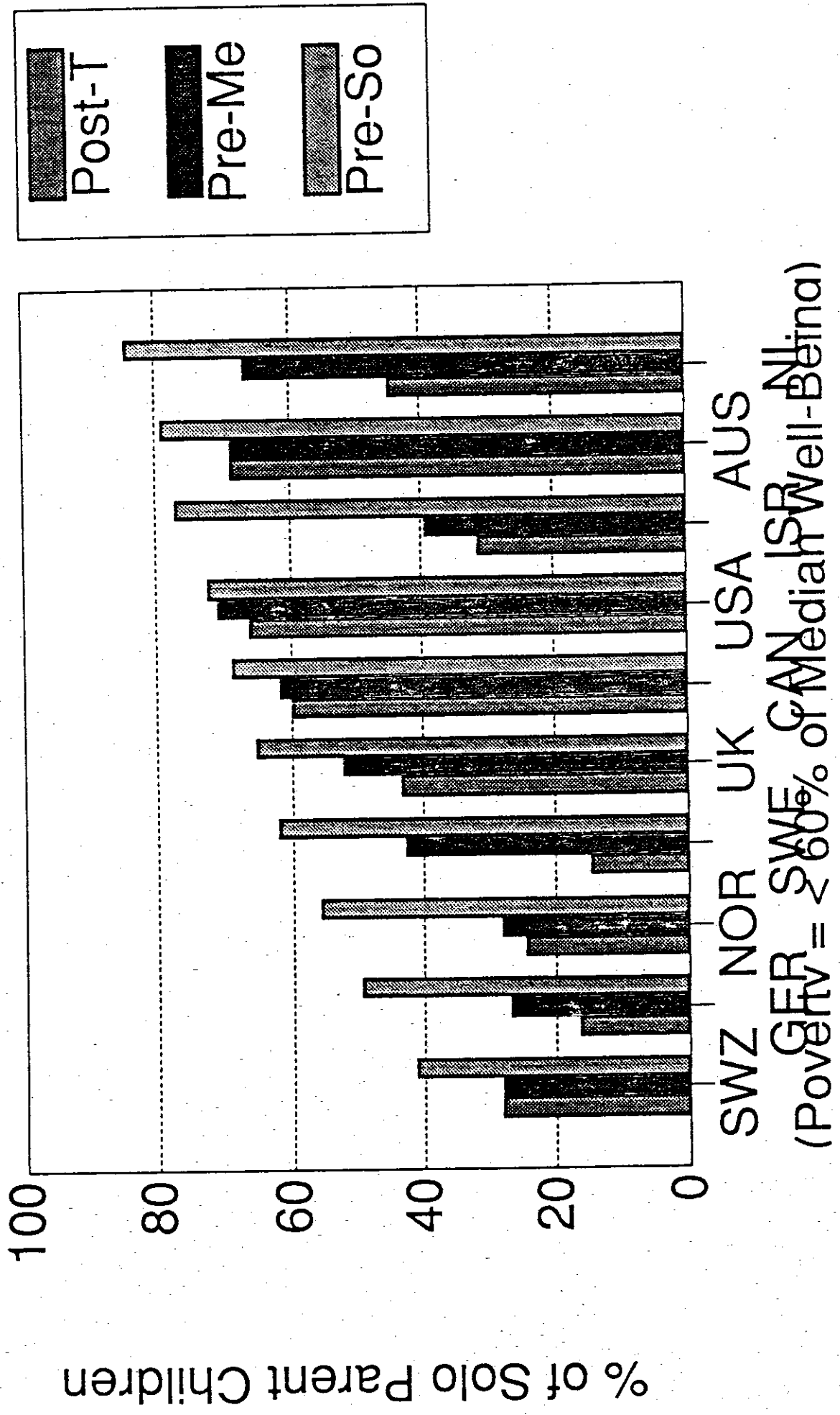


Table 6

Percent of Children, Working Age and Older Adults
Who Would Have Been Below a Given Level without
Social Transfers Who Are Moved Above That Level
By Social Transfers

| | AUS | CAN | GER | ISR | NL | NOR | SWE | SWZ | UK | USA |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Children: | | | | | | | | | | |
| < 40% | 49.3 | 40.3 | 78.6 | 71.3 | 79.0 | 81.5 | 84.2 | 47.9 | 72.7 | 31.5 |
| < 50% | 28.7 | 31.5 | 77.1 | 62.9 | 66.4 | 67.9 | 78.0 | 30.7 | 56.7 | 20.2 |
| < 60% | 20.8 | 24.1 | 66.1 | 49.9 | 44.2 | 54.4 | 72.1 | 20.9 | 53.1 | 11.9 |
| < 70% | 15.3 | 20.3 | 45.1 | 37.3 | 24.0 | 41.9 | 68.6 | 14.3 | 46.1 | 9.0 |
| < 100% | 7.7 | 9.3 | 16.7 | 14.9 | 8.0 | 14.7 | 40.0 | 2.1 | 25.0 | 4.8 |
| Working Age: | | | | | | | | | | |
| < 40% | 39.7 | 34.3 | 66.3 | 56.6 | 71.7 | 56.7 | 65.0 | 14.1 | 60.4 | 25.4 |
| < 50% | 24.6 | 27.1 | 55.3 | 50.7 | 63.9 | 41.7 | 57.7 | 12.6 | 52.6 | 17.7 |
| < 60% | 18.4 | 21.7 | 51.4 | 34.6 | 54.0 | 32.3 | 50.9 | 9.7 | 46.8 | 13.2 |
| < 70% | 14.2 | 19.1 | 36.7 | 26.4 | 38.0 | 28.3 | 43.6 | 7.3 | 42.4 | 9.9 |
| < 100% | 7.0 | 8.9 | 14.0 | 10.9 | 16.4 | 11.2 | 23.2 | 2.6 | 25.2 | 5.8 |
| Older: | | | | | | | | | | |
| < 40% | 82.2 | 71.5 | 88.2 | 60.0 | 94.9 | 95.0 | 99.0 | 81.6 | 73.3 | 64.1 |
| < 50% | 61.4 | 54.2 | 79.3 | 42.7 | 93.2 | 73.6 | 94.4 | 69.9 | 43.1 | 53.0 |
| < 60% | 37.6 | 42.9 | 67.3 | 29.8 | 88.9 | 60.5 | 82.7 | 56.7 | 29.6 | 44.2 |
| < 70% | 23.6 | 31.7 | 56.0 | 20.1 | 78.9 | 42.2 | 68.0 | 44.1 | 22.1 | 36.8 |
| < 100% | 10.9 | 15.4 | 27.3 | 13.3 | 30.9 | 17.9 | 24.8 | 20.7 | 11.4 | 19.6 |

Source: Author's Tabulation from LIS Database. Economic well-being is aftertax family income adjusted for family size ($s=.25$) and age ($a=-.01$) as explained in the text.

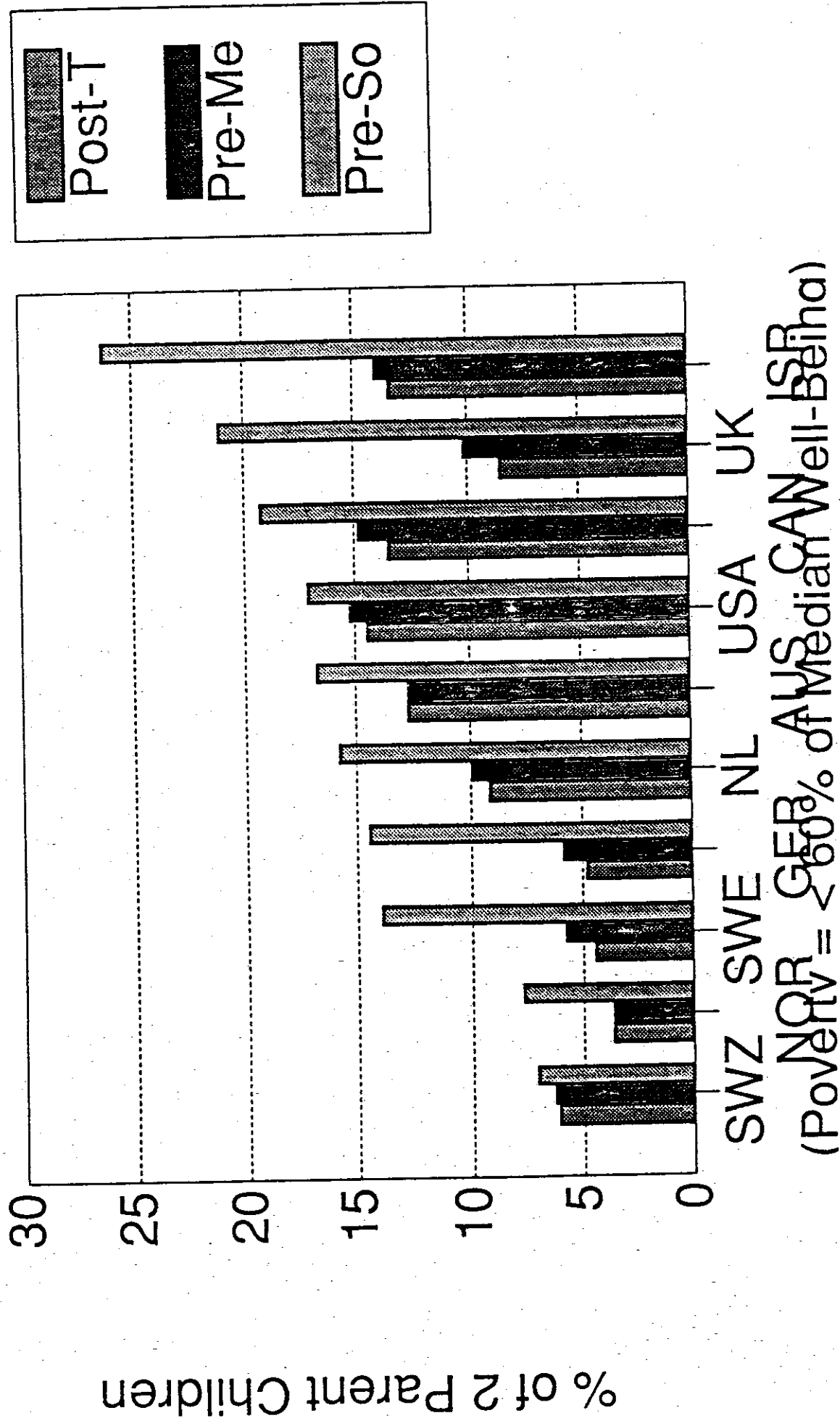
Note: Table is to be read in this way: 49.3% of the children in Australia who would have been below 40% of median economic well-being if no transfer income had been received were moved above that level by social transfers.

We can note that in Sweden, in fact, 40% of all children who would have been below the median income without transfers are moved above it by transfers. In the case of old people Sweden's place is taken by the Netherlands, which moves 31% of those who would have been poor without transfers above the median level.

Income-tested transfers turn out to play important roles in some countries and not at all in others (see Table 7 and Figures 10 and 11). For all children, we find, for example, that income-tested transfers are hardly at all important in Switzerland, Norway, Germany, Canada, and Israel, for moving children out of poverty. To the extent

PRE- AND POST-TRANSFER POVERTY AMONG

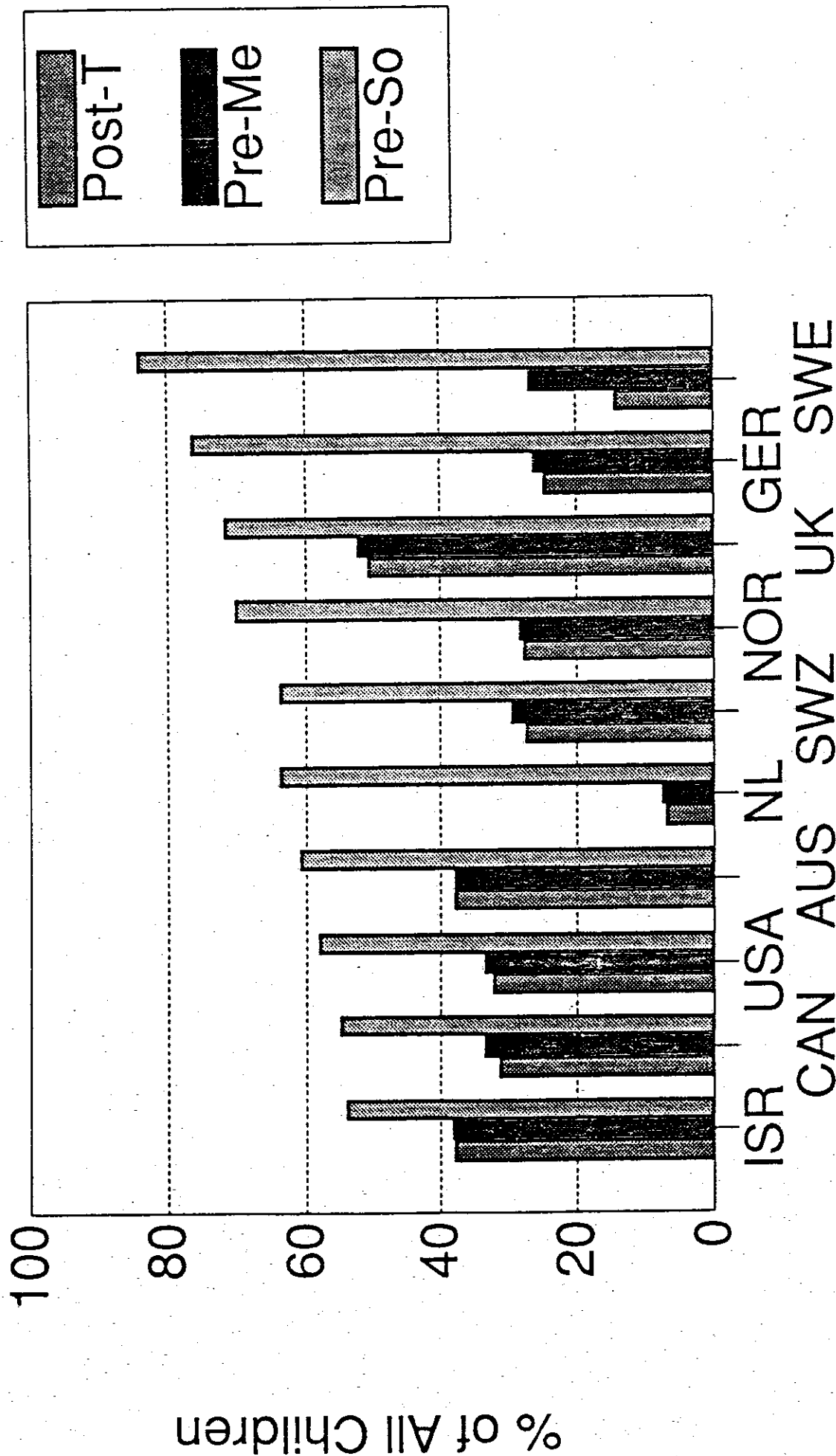
CHILDREN IN TWO PARENT FAMILIES



POOR ELDERLY PRE- AND POST-TRANSFER

FIGURE 11

(Poverty = < 60% of Median Well-Being)



that children are moved out of poverty in the United States, means-tested transfers play a crucial role. Income-tested transfers are also extremely important in Sweden. Thus income-tested transfers move three quarters of solo mother children who would have been below the 50% or 40% levels above those levels and almost two-thirds of those who would have been below the 60% and 70% levels. Thus the role of the housing allowance is a very crucial one for improving the economic well-being of solo-mother children in Sweden.

It plays a clearly noticeable, although less important role, for two-parent families. One can also see the effect of housing allowances for working age adults. It is only in the United Kingdom at the very lowest levels, and in Sweden very broadly, that income-tested transfers play a significant role in the European countries. In Australia, of course, since only child allowances are not means-tested, to the extent that people are moved out of poverty by transfers, it is principally by means-tested transfers.

Table 7
Percent of Children, in Two Parent and Solo Mother
Families Who Would Have Been Below a Given Level
without Means-Tested Transfers Who Are Moved Above
That Level By Means-Tested Transfers

| | AUS | CAN | GER | ISR | NL | NOR | SWE | SWZ | UK | USA | MEAN |
|--------------|------|------|------|------|------|------|------|------|------|------|------|
| Two Parent: | | | | | | | | | | | |
| < 40% | 53.9 | 18.2 | 25.7 | 10.2 | 31.5 | 0.2 | 45.7 | 6.2 | 55.1 | 28.0 | 27.5 |
| < 50% | 36.4 | 12.4 | 13.2 | 10.0 | 22.5 | 0.2 | 37.5 | 0.0 | 21.4 | 16.4 | 17.0 |
| < 60% | 24.5 | 8.7 | 17.8 | 4.0 | 7.7 | 0.2 | 23.3 | 2.2 | 16.0 | 5.5 | 11.0 |
| < 70% | 18.4 | 8.1 | 12.0 | 1.3 | 2.7 | 2.3 | 34.3 | 1.3 | 9.4 | 4.2 | 9.4 |
| < 100% | 8.5 | 2.4 | 3.3 | 2.1 | 0.7 | 0.0 | 18.9 | 0.1 | 3.7 | 1.1 | 4.1 |
| Solo Mother: | | | | | | | | | | | |
| < 40% | 43.0 | 19.7 | 66.1 | 52.9 | 91.7 | 8.1 | 75.1 | 13.3 | 48.4 | 25.7 | 44.4 |
| < 50% | 16.1 | 6.3 | 59.5 | 22.9 | 59.1 | 7.1 | 76.2 | 0.0 | 16.8 | 14.1 | 27.8 |
| < 60% | 13.0 | 2.8 | 38.8 | 20.2 | 32.6 | 13.2 | 65.7 | 0.0 | 17.2 | 6.8 | 21.0 |
| < 70% | 7.0 | 4.9 | 31.4 | 5.7 | 11.2 | 3.1 | 58.1 | 0.0 | 7.3 | 3.6 | 13.2 |
| < 100% | 3.8 | 0.6 | 8.1 | 5.7 | 1.2 | 0.6 | 12.6 | 0.0 | 5.6 | 0.9 | 3.9 |

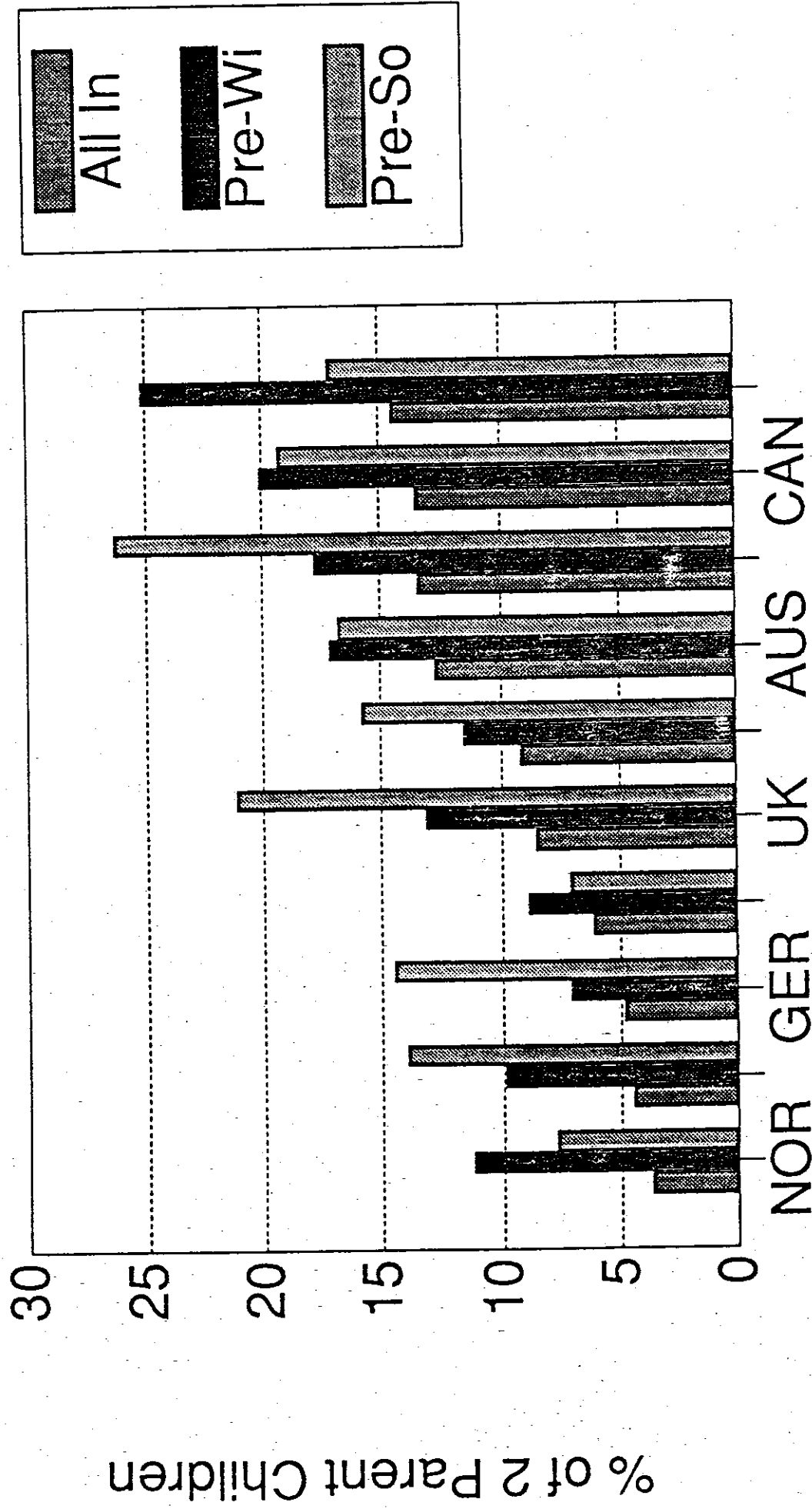
Note: For Australia the figures are identical for total social transfers and means-tested transfers because all social transfers (except child allowances) are mean-tested there.

Comparing the role of mothers' earning in two parent families with the role of transfers in reducing the child poverty rate yields some interesting differences among countries (Figure 12). Mothers' earnings move more children above the poverty line than do transfers in Norway, Canada, the United States, Switzerland, and, by a hair, Australia. In the other countries transfers move more children out of poverty. In Sweden the role of mothers' earning is still quite important with over 50% of the children who would have been poor if there were no mothers' earnings being moved above the poverty line by those earnings.

EFFECT OF MOTHER'S EARNINGS & TRANSFERS

FILE 12

ON POVERTY RATE OF KIDS WITH 2 PARENTS



(Poverty = < 60% of Median Well-Bona)

It is in the Netherlands that mothers' earnings play the smallest role, moving only 20% of the children who would be poor without such earnings, above the poverty line.

Appendix A Need and Equivalence Scales

The diversity of equivalence scales comes very strongly to the fore in comparative studies of economic well-being. In studies within a given nation, the question of choice of equivalence scale is often foreclosed by conventional usage. (This appendix summarizes a more detailed presentation of LIS data on the effect of different equivalence scales by Buhmann, Rainwater, Schmaus and Smeeding in the June 1988 issue of the Review of Income and Wealth which includes a diskette containing 50 detailed tables and documentation of the LIS dataset.)

Concern with these issues has lead the LIS staff to undertake an informal survey of equivalence scales in use in different countries. We use preliminary results of that effort to show in Table A1 a representative range of scales, ordered according to how great the adjustment for family size is in the range from no adjustment to per capita adjustment.

The scales we have assembled can be represented quite well by the single parameter of family size elasticity of need. Economic well-being is related to income and size in the following way:

$$\text{Well-being} = \text{Disposable Income} / \text{Size}^{**s} \quad (1)$$

The equivalence elasticity, s , varies between 0 and 1; the larger it is the smaller are the economies of scale assumed by the equivalence scale. A few of the scales, particularly those based on regression analysis of survey data, specify this power relation. But, most scales do not undertake to fit this kind of mathematical relation. Some state a simple rule thumb -- e.g., additional adults after the first have weights of .7; additional children .5. Others incorporate diminishing weights for each additional person. Some are phrased in terms of the ages, rather than the number of children.

Equivalence scales generally are presented as income amounts, or ratios of amounts, needed by families of different size and/or structure. Thus, if a one person family needs one unit of income to maintain a given level of living, a two person family is said to need 1.7 units, a three person family 2.2 units, etc. As is apparent from the table, however, the specific amounts or ratios in the equivalence scales can be very closely approximated by the single parameter of a power to which family size is raised to index need. The correlations are all very close to one. While some scales also involve variations in need by age of family members and by family structure (one parent, two parent), when converted to simple scales by family size or so much per adult and per child the scale values fit the power relation very closely. One would have to have strong evidence indeed to justify paying attention to the residuals from the log linear relation.

These equivalence scales cover almost all of the range between the extreme elasticities of 0 and 1. The range is from 0.12 for a scale developed from the van Praag Income Evaluation Question in France to 0.84 for the equivalence scale used in the report of the first European Poverty Programme report.

We can identify two types of scales developed using experts' general knowledge, and two types developed empirically from analysis of survey data.

Table A1
Family Size Exponents in 34 Equivalence Scales

| Type of Scale: | Subj. | Value of e: | | | Correla tion with Ln(Size) |
|-------------------------------|-------|-------------|----------------|---------------------|----------------------------------|
| | | Cons. | Expert Scales: | Program:Statistics: | |
| Unadjusted Family Income | | | | 0 | -- |
| IEQ -- France | 0.12 | | | | 1.00 |
| IEQ -- Belgium | 0.17 | | | | 1.00 |
| IEQ -- United Kingdom | 0.18 | | | | 1.00 |
| MIQ -- US Dubnoff data | 0.18 | | | | |
| MIQ -- US ISDP | 0.21 | | | | 1.00 |
| IEQ -- Netherlands | 0.22 | | | | 1.00 |
| Necessities -- US 1960-61 | | 0.23 | | | 1.00 |
| MIQ -- US Gallup | 0.23 | | | | |
| IEQ Switzerland | 0.26 | | | | 1.00 |
| IEQ Germany | 0.27 | | | | 1.00 |
| IEQ Denamrk | 0.27 | | | | 0.98 |
| IEQ corrected -- Netherlands | 0.29 | | | | |
| IEQ -- Ireland | 0.32 | | | | 1.00 |
| PIE -- US | 0.33 | | | | 1.00 |
| Dutch Poverty | | | 0.35 | | 0.98 |
| MIQ corrected -- Netherlands | 0.36 | | | | 1.00 |
| Expenditures -- US 1960-61 | | 0.37 | | | 0.95 |
| Expenditures -- US 1972-73 | | 0.38 | | | 0.99 |
| Food -- US 1960-61 | | 0.47 | | | 1.00 |
| Swedish Poverty | | | 0.54 | | 1.00 |
| Australian Poverty | | | 0.55 | | 1.00 |
| Swiss Poverty | | | 0.56 | | 1.00 |
| US Official Poverty | | | 0.56 | | 0.98 |
| Canadian Official Poverty | | | 0.56 | | 1.00 |
| Expenditures -- Switzerland | | 0.57 | | | 0.98 |
| British Poverty | | | 0.59 | | 0.99 |
| German Poverty | | | 0.67 | | 1.00 |
| European Poverty Line 3 | | | | 0.70 | 1.00 |
| O'Higgins | | | | 0.72 | 1.00 |
| US Bureau of Labor Statistics | | | | 0.72 | 1.00 |
| OECD Poverty Line | | | | 0.73 | 1.00 |
| European Poverty Line 1 | | | | 0.84 | 1.00 |
| Per Capita Consumption | | | | 1.00 | 1.00 |
| MIN | 0.12 | 0.23 | 0.35 | 0.70 | |
| MAX | 0.36 | 0.57 | 0.67 | 0.84 | |
| MID | 0.24 | 0.40 | 0.51 | 0.77 | |
| AVG | 0.24 | 0.40 | 0.55 | 0.74 | |

IEQ -- Income Evaluation Question
MIQ -- Minimum Income Question
PIE -- Public Income Evaluation

1. Expert scales. These are scales developed by experts using a variety of materials. Usually the developers are being responsive to considerations of policy and precedent. These may be scales explicitly asserting how need varies by family size as in the U.S. Poverty Line or implicitly doing so by establishing amounts payable by a transfer program as in the Supplementary Benefits scheme (and associated housing supplements) in the United Kingdom.

Two somewhat different goals of expert scales are apparent. In some cases the scales are developed only for statistical purposes -- that is, in order to count persons below or above a given standard of living -- minimum adequacy, for example. The Bureau of Labor Statistics family budgets are a good example, or the scales used by OECD or the European Community to count the low income population.

The other type of expert scale is focused on defining benefits for social programs -- the Supplementary Benefits scale, or the Swedish "base amount" are examples of scales used to calculate benefits under social protection programs. The US poverty line was initially developed for statistical purposes but over the years has come to serve also as a guide to the adequacy of program benefits.

2. Survey-based scales. These employ multivariate analyses of either consumption expenditures or respondents' assessment of the adequacy of income in terms of some particular target (making ends meet, not being poor, having a very good income, etc.). In the one case the effort is to measure utility indirectly through the revealed preferences of consumer spending constrained by disposable income. In the other the goal is to measure directly the utility associated with particular income levels for families of given characteristics.

Table A1 suggests that these types of scales tend to populate different regions in the continuum from a size elasticity of zero to one. The expert scales have the highest elasticities -- averaging .74 for the ones we call statistical, and .55 for the program oriented ones. The consumer expenditure scales are centered in the high .30s. The subjective scales average around .25.

In order to explore how much difference these varying definitions of need make for crossnational income comparisons we can examine four different size elasticities selected to represent the range, and named after the type of scale most often associated with elasticities in a given segment of the zero to one range:

SUBJ -- a scale with an elasticity of .25
 CONS -- a scale with an elasticity of .36

PROG -- a scale with an elasticity of .55
 STAT -- a scale with an elasticity of .72

The Effects of Income and Size on the Distribution of Well-Being

A country's distribution of well-being measured by one of our scales is a product of its distribution of disposable income, its distribution of family size, and the degree to which the two are correlated. The problem is tractable if dealt with in logarithmic form.

The standard deviation of the logarithm of any well-being measure (w) which adjusts disposable income (i) by a size equivalence elasticity (s) according to the equation in (1) above, is determined by the standard deviations of the logs of disposable income and family size (f) and their correlation (Rif).

$$SDw = (SDi^{**2} + (SDf^{**2})(s^{**2}) - 2s(Rif)(SDi)(SDf))^{**}.5 \quad (2)$$

The larger s is, the more the variance of well-being reflects the variance of family size, although this is moderated by the negative effect of the correlation between income and size.

The rank order of SDw for the ten LIS countries is almost the same for each equivalence scale. Israel and the Netherlands behave differently from the other countries -- increasing values of s result in a higher variance of well-being than of disposable income -- while in the other countries the variance of well-being is lower than that of income for all size elasticities. The variance of well-being is usually lowest at an s of around 0.5. Israel and the Netherlands have the lowest correlations between income and size; therefore in those countries the variance of well-being either does not decrease as fast as in other countries within increases in s, or rises faster at higher values of s. (See Figure A1.)

In short, using different equivalence scales does not produce very different pictures of the inequality ranking of countries when inequality is indexed by the variance of the logarithm of well-being.

What of the effect of different equivalence scales on the relative position of persons within each country? How much do individuals' positions in the distribution change when disposable income is adjusted by different equivalence scales? We showed above in equation (2) that the standard deviation and variance (V) of any logged well-being measure can be calculated from the standard deviations of income and size and their correlation. It is also the case that the correlation of any two well-being measures can be calculated from the same three items. The covariance (CV) of any two well-being measures (w1 and w2) is a function of these three and of the two values of size elasticity

POVERTY RATE (< 50% Mdn) FOR DISPOSIBLE

INCOME AND FOUR EQUIVALENCE SCALES

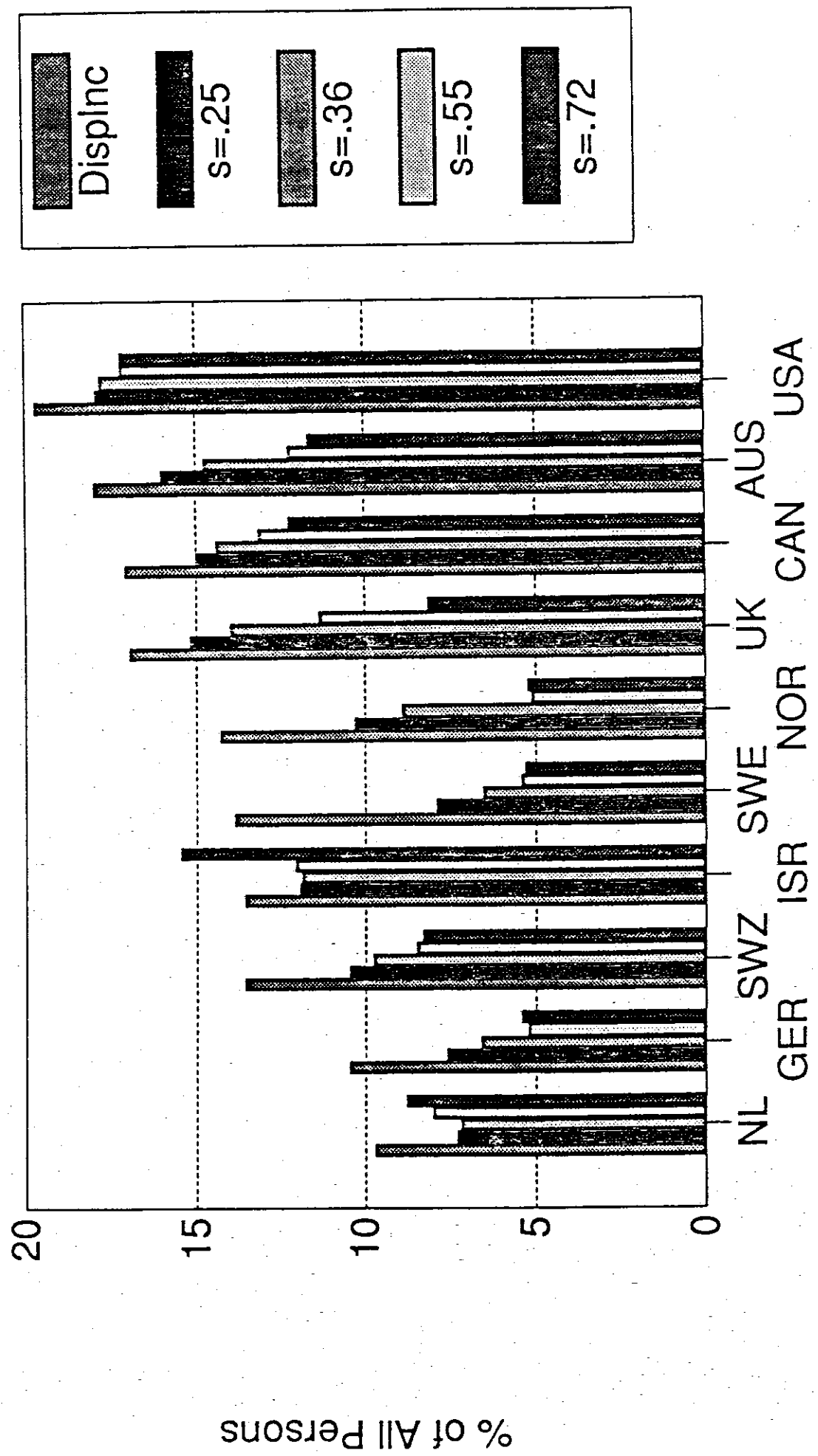


FIGURE A1

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(s1 and s2).

$$CVw1w2 = V_i + (s1*s2)V_f - R_{if}((V_i*V_f)^{.5})(s1+s2) \quad (3)$$

The correlation of w1 and w2 is, of course, equal to the covariance divided by the square root of the product of the two variances, each of which can be calculated using (2).

In general, the lower the correlation between size and income, the higher will be the correlation between any two well-being measures.

We can also note that the correlation of any variable (x) with a well-being measure can be calculated once one knows the variance of the variable and its covariances with income and size. The covariance of x with a well-being measure is:

$$CV_{xw} = CV_{xi} - (s)(CV_{xf}) \quad (4)$$

Choice of equivalence scale has much more effect on where individuals appear in the distribution in some countries than in others. This is particularly apparent when one considers the extremes of the correlation of disposable income and per capita income. The correlation between these two (logged) variables ranges from a high of .732 in the Netherlands to a low of .365 in Sweden.

But any reasonable adjustment of income for size increases these correlations sharply. Comparing our two extreme scales, STAT and SUBJ, we find the correlations ranging from .819 in Sweden to .934 in the Netherlands. With adjacent scales the lowest correlation is .974. This suggests that fine tuning of equivalence scales is not particularly important -- the important issues have to do with whether a scale is in the high, middle or low part of the 0 to 1 range.

When age (as transformed in the way described in the text) is added to the calculation of need as discussed in the body of the paper, it is a simple matter to extend the variance formula:

$$V_w = V_i + V_f + V_a - 2CV_{if} - 2CV_{ia} + 2CV_{fa} \quad (5)$$

I leave it to the reader to work out the covariance formula for any two equivalences.