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AN EVALUATION OF SUBJECTIVE POVERTY DEFINITIONS: COMPARING RESULTS FROM THE U.S. AND THE NETHERLANDS

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In this paper, results of applying the subjective definition of poverty, introduced by Goedhart *et al.* (1977), in the U.S. and the Netherlands are compared. This definition focuses on the monetary amounts which people consider necessary to make ends meet for their households as provided in response to the Minimum Income Question (MIQ). National data from both countries in the early 1980s are analyzed. In regressions of reported minimum income, corrections are made for the omission of income components and selective non-response. For the first time the relationship between fixed expenditures and the MIQ is examined. Factors significantly related to reported minimum income include household income, household composition, age, education, sex, region, fixed expenditures, and whether the household experienced recent income changes. The income elasticity appears to be smaller in the U.S. than in the Netherlands, while the effects of other socioeconomic factors are greater. On average, the resulting subjective income thresholds are above official poverty lines, but more so in the U.S. than in the Nerherlands. Whether thresholds based on answers to MIQs should be regarded as poverty lines remains open to question.

1. INTRODUCTION

Although social scientists in most developed countries agree that poverty remains a social problem in their countries despite the unprecedented economic growth after 1945, there is little unanimity as to the way in which poverty should be defined. Broadly speaking, the variety of definitions in use can be divided into three categories: absolute definitions, relative definitions, and subjective

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definitions (see Hagenaars and de Vos, 1988). In the past, absolute definitions, which consider poverty to be a situation in which households are below an objectively defined absolute minimum, dominated (Engel, 1895; Orshansky, 1965). In recent years, relative definitions in which poverty depends on the situation of others in society have been proposed. Relative definitions seem to have become most popular in Europe (e.g. Townsend, 1979; EEC, 1981), and may be seen to form an implicit basis for social security legislation in countries like the Netherlands. A fairly new development is the subjective definition of poverty; this definition is based on the idea that the opinions of people concerning their own situations should ultimately be the decisive factor in defining poverty. Examples are the approaches based on Income Evaluation Questions and the like, originated by van Praag (1968), and the approach based on questions about necessities which a household should possess, originated by Mack and Lansley (1985). In this article we concentrate on the subjective definition introduced by Goedhart *et al.* (1977). In this definition the monetary amounts which people consider to be necessary to make ends meet for their households are used to compute poverty cut-offs. Following this approach, we compare results from using U.S. and Dutch household survey data.

There are considerable differences between the respective roles of government in the U.S. and in a European country like the Netherlands. To a certain extent, differences between the prevailing poverty definitions, and differences in the measures to combat poverty may be seen to be associated with the political doctrines upon which these diverging roles are based. Whether analogous differences may also be found in the opinions of the respective inhabitants concerning the income needed to make ends meet is of special interest in our comparison of subjective poverty lines between the two countries. We attempt to answer questions like: Is the concept of minimally necessary income more absolute in the U.S.? Do social factors play a larger role in the Netherlands? How do subjective poverty lines compare to the respective official poverty lines?

So far, the literature on subjective poverty lines in the U.S. (Colasanto, Kapteyn, and van der Gaag, 1984; Danziger *et al.* 1984) has concentrated on family size equivalence scales and the factors which have differentiated the official poverty lines (i.e. farm/non-farm, sex, old age). The early European studies have also concentrated upon family size (Goedhart *et al.*, 1977; van Praag, Hagenaars, and van Weeren, 1982), but lately the possible role of a number of other household characteristics (e.g. age, education, occupation) has also been acknowledged (Hargenaars, 1986). Kapteyn, Kooreman, and Willemse (1988) have stressed the influence of reference groups.

In this article some consequences of differentiating the subjective poverty line with respect to various household characteristics in addition to family size are presented. Moreover, for the first time attention is paid to the possible influence of fixed expenditures on reported minimally necessary income. The possible influence of recent household changes is also considered. Finally, objections against the subjective minimum income method to identify poverty lines are briefly discussed.

2. Methods and Data

2.1. *The Intersection Method*

As introduced by Goedhart *et al.* (1977), subjective poverty lines are calculated as the income level where Y_{min} equals Y given the relationship

$$\log(Y_{min}) = a_0 + a_1 \log(Y). \tag{1}$$

Here Y_{min} represents the answer to questions like "What income do you consider to be minimally necessary for your household to make ends meet?" (the so-called Minimum Income Question, MIQ), and Y represents current household income. The idea behind the choice of the intersection of relationship (1) with the line $Y_{min} = Y$, represented by Y^*, is that only people whose incomes are equal to their minimally necessary incomes have realistic pictures of this minimum income level. Respondents with more income are likely to overestimate their minimally necessary income while those with less income are expected to underestimate it. Figure 1 illustrates this approach.

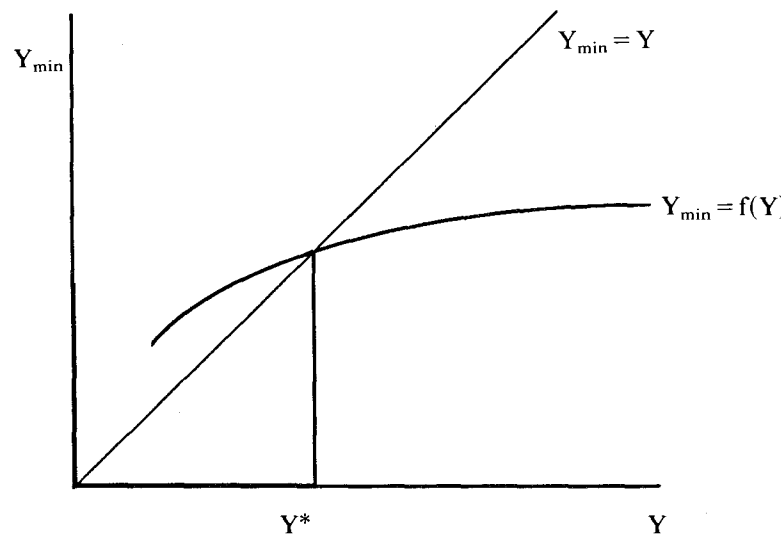

Figure 1

The answer to the MIQ depends not only on income but also on household characteristics. Thus, families with different characteristics require different amounts of money to make ends meet. By adding family size and other household characteristics to regressions of equation (1), separate intersections for diverse household types may be calculated, resulting in associated household equivalence scales.

A basic assumption for the calculation of subjective income thresholds is that every respondent adheres the same meaning to the wording used in the questions concerned. For instance, with the MIQ, the expression "minimally

necessary to make ends meet" is supposed to have the same welfare connotation for all respondents. Even if one accepts the possibility of interpersonal comparisons of welfare, a careful formulation of the questions is needed. This is especially true for international comparisons where language differences may hamper the phrasing of terms with the same meaning.

2.2. *Data*

The U.S. data are from the Continuing Consumer Expenditure Survey (CEX) for 1982. The CEX is sponsored by the Bureau of Labor Statistics (BLS), U.S. Department of Labor; data are collected by the Bureau of the Census. Data are collected quarterly from a national probability sample of households designed to represent the civilian non-institutional population and a portion of the institutional population living in selected types of group housing. However, in 1982, households living in rural areas outside Standard Metropolitan Statistical Areas (SMSA's) were not surveyed due to budgetary constraints. Data are collected from consumer units which are composed of an individual or group of two or more individuals who pool their incomes to make joint expenditure decisions. Panels of consumer units are interviewed over five consecutive quarters on a rotating basis. The reference person is the first member of the consumer unit mentioned by the respondent when asked to "Start with the name of the person or one of the persons who owns or rents the home." For more information on the survey, see U.S. Department of Labor, 1986.

The MIQ was included in the CEX questionnaire only during one time period of the continuing survey: January, 1, 1982 through January 31, 1983. The question was asked during the fifth interview; thus, only consumer units with a fifth interview qualified for our study sample. The resulting sample includes 4,830 consumer units. For the CEX, the MIQ question is as follows: "Living where you do now and meeting the expenses you consider necessary, what would be the smallest income (before any deductions) you and your family would need to make ends meet?" Using time period data, we annualized these before tax incomes.

The Dutch data are from a 1983 newspaper survey. In cooperation with Bernard van Praag and Aldi Hagenaars, at the time affiliated with the Center for Research in Public Economics of Leyden University, ten regional Dutch newspapers included a two-page questionnaire with a set of 67 questions in their September 1983 Saturday editions. Questionnaires were returned by approximately 20,000 households. Questions referred to household characteristics, income, expenditures, and a series of related subjects. For this data set, a household is defined as a group of people living together whose expenditures are made from common pooled resources. The main breadwinner in the household is the person who contributes the most money. For the study sample, data from a subset of 13,720 households is used. For more information on the survey, see de Vos and Hagenaars (1986).

In the Dutch survey, the MIQ was part of a seies of questions concerning one's opinion about a possible new system of social security with a "basic income" to which every household without a source of income should be entitled. After

asking whether one would be in favor or against such a system, the question we use as the MIQ is as follows: "The previous question was about the basic income ('needs minimum'). How high should that be for your household, according to you?" Respondents were directed to report minimum incomes after taxes were deducted.

Although the context and wording of the U.S. and Dutch MIQ's are clearly different, we nevertheless feel confident that comparisons can be made legitimately, since both questions try to assess the income level which respondents consider to be minimally necessary for their households. Yet, we agree that a question remains concerning whether the income levels computed as the intersection of equation (1) with the relationship $Y_{\min} = Y$, corresponding to a level of living associated with "making ends meet", can really be seen to represent poverty. If the answer to this question is no, then the term subjective "poverty" may not be entirely appropriate. In view of this, we refer to the intersection levels as "income sufficient thresholds," in addition to the more frequently used "subjective poverty lines."

2.3. *Additional Explanatory Variables for* $Y_{\min}$

As from the early days of subjective income threshold research, equivalence scales have been computed by adding log (family size) to equation (1) and then computing family size differentiated thresholds. Since then, other researchers, especially Hagenaars (1986), have extended the number of explanatory variables to be included in equations like (1), and hence as differentiating factors for the subjective poverty line. It can be argued that even if a variable having a significant effect in (1) is not accepted as a differentiating factor for the poverty line (e.g. due to political objections), such a variable should still be taken into account to obtain unbiased estimates of other differentiating effects.

In this section we present the variables that we add to $\log(Y)$ in equation (1). Person characteristics refer to the main breadwinner or to the reference person in the Dutch and U.S. surveys, respectively. Main breadwinner and reference person are used synonymously throughout the remainder of this article, as are household, family, and consumer unit.

Instead of log (family size) as an explanatory variable for $\log(Y_{\min})$, we have chosen to add several dummy variables to represent household composition. For example, we include variables to identify whether the household includes one person or a lone parent, in contrast to an adult couple or more than two adults. Additional variables are included to represent the number of persons in the household other than the reference person and (or) spouse. The advantage of this approach is that not all differences between households are forced into the logarithmic family size function.

We also allow differentiation according to the number of earners, since this may also affect the perceived minimally necessary income. For example, households whose members have paid jobs are expected to have expenses over and above what they would have if they were not working; yet, they may be able to profit from fringe benefits associated with a job which lower their expenses. Furthermore, having a paid job leaves less time available for home production,

which may increase the money income necessary to make ends meet (see Homan, 1988, for the differences between one earner and two earner households in this respect).

A variable indicating disability as a reason for the reference person not working enters the equation for non-earners. This variable is included because disability often means that additional financial resources are required, all else equal.

The age of the main breadwinner (and age^2) is included in the regression to allow for objective differences in the minimal costs between the different age groups (e.g. as a result of different minimally necessary levels of nutrients), and to allow for perceived differences as a result of different habits or having different reference groups. Two additional age related variables are added to the equation to allow for specific effects of being 65 years of age or older. These are dummy variables for single persons and for two person households in which the reference person is 65 or older.

Differences in the ages of household members other than the reference person and spouse are taken into account by including dummy variables for the age group of the oldest other member. In the Dutch data set, this member is always a child; in the U.S. data set, the member could be a child or any other member of the household such as a grandparent.

Just like age, education may be a determinant of the reference group and the habits of a household; therefore education dummies are included as additional explanatory variables. The dummy variables we include in the regression for education pertain to low education [no education, or only elementary education in the U.S., and no more than lower vocational training (LBO) in the Netherlands] and high education [more than high school in the U.S., and university or higher vocational training (HBO) in the Netherlands].

In the U.S. we allow for differences in perceived income sufficiency as related to being in different racial groups, black versus non-black. Again, these may be reflective of differences in culture, habits, and reference groups.

Sex of the reference person is also used as a differentiating factor. We wanted to determine whether female headed families might report different minimal levels of income than would their male counterparts. Our interest in perceived minimum income differences related to sex is more specifically related to the interaction of female and marital status. Other studies (e.g. Duncan and Hoffman, 1985; Zick, Smith, and Duncan, 1987) have revealed that women who are divorced, separated, or widowed are likely to experience lower levels of living than they did when they were married and than do their male counterparts. For the U.S. regression, we include dummy variables for the reference person's sex and martial status. This distinction is not possible for the Netherlands because marital status is defined only as with or without a partner. The omitted category in both regressions is male.

Differences in the cost of living may be expected between different geographic regions and between different areas based on degree of urbanization. Thus, for the U.S., we include dummy variables to allow for these differences. For the Netherlands, which may be seen as one densely populated region, we lack data on region and urbanization.

In answering the question "what income would be minimally necessary to make ends meet", it is conceivable that respondents consider the expenditures they have and expect to have in the future. Many categories of expenditures can be adapted at any moment to different circumstances, but some expenditures do not easily allow such adaptation at will. This is because they are fixed due to long term contracts and can only be changed at heavy costs. It is therefore conceivable that in answering the MIQ respondents with relatively high fixed expenditures report higher minimum incomes than do households whose fixed expenditures are lower. Therefore, we perform an additional regression in which we include the logarithm of annual fixed expenditures as an extra explanatory variable. We define expenditures as expenditures for housing, energy and water, property taxes, municipal levies, and insurances. Expenditure data from the two surveys are annualized.

Additional explanatory variables, which we add to another separate regression for the Netherlands, are dummy variables which indicate whether the income of the household has recently undergone a substantial increase or decrease. Income changes might affect the answer to the MIQ due to habit formation, in that the answer might partly depend on the previous level of income.

When answering the MIQ, people tend to underestimate their own actual income. Dutch researchers (Kapteyn, Kooreman, and Willemse 1988; Homan, 1988) have found that respondents tend to forget income components which are not received at least monthly, and that the earnings of household members other than the main breadwinner are only partially taken into account when answering the MIQ. It is clear that ignoring the neglected income effect would result in the computation of incorrect values for the poverty thresholds. We correct for this by estimating the incomes which respondents have in mind, their "anchor incomes", in relationship to their perceived minimum incomes (Y_{min}). See Appendix 1 for details.

Finally, we include a variable to correct for possible bias due to selective non-response with respect to the MIQ and household income. This variable was created from the results of a probit regression in which the dependent variable equalled one if the consumer unit provided the relevant information and zero otherwise. See Appendix 2 for details.

3. Results

3.1. *Regression of* $\log(Y_{\min})$

Comparing the regressions of Table 1, a first striking difference between the two sets of results may be found in the explained variances. The multiple correlation coefficient (adjusted R^2) in the Dutch regression is clearly lower than the coefficient for the U.S. data set. This cannot be explained by the fact that the U.S. regression contains additional explanatory variables, since the contribution of these extra variables hardly differs significantly from zero.

Another notable difference is that the reported minimum income increases less with actual income in the U.S. than in the Netherlands. The fact that $Y_{\min}$ varies less with income might indicate a narrower range, or greater consensus,

TABLE 1

RESULTS OF REGRESSION (1) WITH CORRECTION FOR THE EFFECT OF NEGLECTED INCOME COMPONENTS AND SELECTIVE NON-RESPONSE

	U.S. (1982) ($n = 3520$)		Netherlands (1983) ($n = 10389$)	
Variable	Coefficient	Standard Error	Coefficient	Standard Error
Intercept	4.995*	0.159	4.126*	0.127
Log (Y)[a]	0.430*	0.015	0.552*	0.012
Single, working	−0.142*	0.049	−0.090*	0.019
Single, not working	−0.172*	0.071	−0.049	0.025
1 parent, working	0.017	0.066	—	—
1 parent, not working	−0.001	0.091	0.035	0.025
2 persons, 2 earners	−0.009	0.048	0.049*	0.019
2 persons, 0 earner	−0.005	0.055	0.029	0.023
>2 persons, >2 earners	0.134*	0.057	—	—
>2 persons, 2 earners	0.092	0.052	0.051*	0.021
>2 persons, 1 earner	0.074	0.055	0.041*	0.018
>2 persons, 0 earner	−0.157	0.100	0.096*	0.024
2 others	0.059	0.032	0.049*	0.010
3 others	0.112*	0.040	0.095*	0.014
4 or more others	0.061	0.045	0.160*	0.025
Disabled	−0.083	0.049	0.015	0.015
Age/10	0.221*	0.040	0.127*	0.025
Age^2/1000	−0.216*	0.043	−0.109*	0.030
Single, 65+	−0.043	0.068	0.057	0.047
2 persons, 65+	0.042	0.057	−0.036	0.027
Oldest <6	0.003	0.043	−0.003	0.014
Oldest 6<12	−0.030	0.039	−0.011	0.011
Oldest >=18	−0.006	0.029	0.002	0.012
Low education	−0.091*	0.032	−0.009	0.008
High education	0.111*	0.020	0.012	0.008
Black	0.008	0.031	—	—
Female, married	0.056	0.040	—	—
Female, widowed	0.024	0.041	—	—
Female, divorced/separated	−0.036	0.039	—	—
Female, never married	−0.083*	0.036	—	—
Female	—	—	0.031*	0.012
Northeast	0.045	0.031	—	—
Midwest	−0.051*	0.024		
West	−0.014	0.026	—	—
City	0.033	0.020	—	—
Rural	−0.010	0.026	—	—
Selectivity correction	−0.194	0.158	−0.134	0.078
Adjusted R^2	0.488		0.344	

*Significantly different from 0 ($p = 0.05$).

[a]Coefficient obtained by adding 1 (the fixed coefficient of anchor income) to the original income coefficient. See Appendix 1 for details on the correction for neglected income components.

concerning the level of necessary income to make ends meet in the U.S. It might also be that the role of income is partially taken over by other variables like age and education, which have higher coefficients, in the U.S.

With respect to the household composition and earner variables, it must be conceded that the distinction of this many variables probably makes too many

demands on the data. On the other hand, a number of differences between the two regressions would have remained unnoticed if we had laid the straitjacket of log(family size) on the household composition effects. For example, although single persons in both countries need less than two person households, the difference is clearly larger in the U.S. Households with more than two persons generally need more, but in the U.S. the difference is significant only for households with more than two earners. The coefficient for two person households in the Netherlands with two earners is significantly positive. This result is plausible since working is likely to lead to additional costs, for example, for transportation and clothing. However, this coefficient is very sensitive to our choice of the method to correct for neglected income components (see Appendix 1). The result that households with no earners report relatively higher minimum incomes in the Netherlands than in the U.S. is probably related to the wording of the MIQ; non-earners would be the first to be confronted with the basic minimum income mentioned in this question.

As for the effects of the number of other members in the household, compared to households with one other member, the coefficients for two and three others are positive and comparable in both countries. Households with four or more others only report significantly higher minimally necessary incomes in the Netherlands.

Some of the most interesting differences between the two regressions concern the coefficients representing the effects of age and education of the reference persons. The relationship between minimally necessary income and age is clearly flatter in the Netherlands than in the U.S. The age coefficients imply that, all else equal, minimum perceived income peaks at age 51 for the U.S. and at age 58 for the Netherlands. Consumer units with reference persons aged 51 report minimum incomes that are 23 per cent greater than the minimum incomes reported by 20 year olds. For the Netherlands, the 58 year olds report minimum incomes that are only about 16 per cent greater than those reported by 20 years olds.

The difference in the effects of the education dummy variables is remarkable indeed. The differences in the reported minimal incomes among the different education groups amount to an insignificant value of about one per cent in the Netherlands. However, in the U.S., the differences between the respective education groups are clearly significant, implying a difference of some 22 per cent between the highest and the lowest education groups. This results in intersection amounts that are more than 43 per cent higher for households in the high education group, compared to the low education group (all else equal).

Basically, two kinds of explanation can be presented for the effect of education on minimal income (see, e.g. Hagenaars, 1986). The first concerns the fact that higher educated people generally have invested more in their education, and hence will need higher amounts of income to reach the same level of welfare. It is not improbable that this effect is stronger in the U.S. where the financial costs of obtaining higher education are much greater than they are in the Netherlands. A second explanation for the higher minimum incomes in higher education groups is the reference group effect; higher educated people generally have relatively more friends and acquaintances who have higher educations (and higher incomes) than do people with low levels of education. This may influence their perceived

minimum incomes; they will need higher incomes to live up to the standards of their reference group. Considering the regression results one could be tempted to conclude that this effect may also be stronger in the U.S.

The remaining coefficients in Table 1 require less comment. Female headed households in the Netherlands report significantly higher minimum incomes than do males. The reverse is true only for one of the sex/marital status groups for the U.S.: never married females. The differences between the different regions are not significant with the exception of one; households in the Midwest report needing less income to make ends meet than do those living in the South. Whether households live in urban, suburban, or rural areas makes little difference in their reported minimum incomes. However, as noted earlier, the U.S. rural sample was drawn from within SMSA's. Differences between rural households living outside SMSA's and those living within SMSA's may be greater than these results imply. The correction factor, included to correct for selective non-response, does not result in a significant coefficient in either of the regressions.

In general, it may be concluded that the coefficient of log (Y) in the regression of log ($Y_{\min}$) is somewhat smaller and that the coefficients of most other differentiating factors are somewhat larger in the U.S. than in the Netherlands. This holds both for factors objectively leading to differences in minimal needs, like household composition, and for social characteristics like education. Nevertheless, the regression results are quite comparable. Most importantly, there are no clear indications of basic differences in views concerning minimum necessary income, despite differences in official policy with respect to poverty and government transfer programs in the two countries. Yet, whether these household differences should be taken into account when computing poverty lines officially remains to be answered.

3.2. *Thresholds and Percentages*

In this section we present results pertaining to the subjective minimum income thresholds computed from the regression results presented in Table 1. However, we do not try to give a complete picture for all possible combinations of differentiating factors, but limit ourselves to the means of the thresholds computed for individual households on the basis of primarily their family size.

As we mentioned in section 2, the threshold (Y^*) is computed as the intersection of the relationship

$$\log (Y_{\min}) = a_0 + a_1 \log (Y) + a_2 z_2 + \ldots + a_n z_n \tag{2}$$

with the line $Y_{\min} = Y$ for different values of $z_2 \ldots z_n$. Hence:

$$Y^*(z_2 \ldots z_n) = \exp ((a_0 + a_2 z_2 + \ldots + a_n z_n)/(1 - a_1)). \tag{3}$$

Tables 2 and 3 provide the means of the resulting income sufficiency thresholds according to family size for the U.S. and the Netherlands, respectively. For comparison, we have added the means of the relevant actual incomes for each country, official poverty thresholds for the U.S., and official social minimums for

TABLE 2

WEIGHTED MEANS OF INCOME, OFFICIAL POVERTY THRESHOLDS, SUBJECTIVE INCOME THRESHOLDS, AND CONFIDENCE INTERVALS BY FAMILY SIZE FOR THE U.S. IN 1982 (U.S.$./YEAR)

	Actual Before Tax Income	Official Poverty Threshold	Subjective Income Threshold	Confidence Interval for Subjective Threshold	
1 person, <65	$14,062	$5,019	$12,144	$9,176	$15,112
1 person, > = 65	8,016	4,626	9,668	6,379	12,957
2 persons, <65[a]	26,921	6,482	16,753	12,638	20,867
2 persons, > = 65[a]	17,102	5,837	15,641	10,521	20,760
3 persons	27,755	7,686	19,694	14,985	24,402
4 persons	30,815	9,860	22,374	17,153	27,594
5 persons	30,762	11,700	24,226	18,218	30,234
6 or more persons	27,784	15,273	22,119	16,341	27,897
Total	23,013	7,529	17,296	13,095	21,496

[a]Age of reference person.

TABLE 3

WEIGHTED MEANS OF INCOME, OFFICIAL SOCIAL MINIMUMS, SUBJECTIVE INCOME THRESHOLDS, AND CONFIDENCE INTERVALS BY FAMILY SIZE FOR THE NETHERLANDS IN 1983 (DFL/YEAR)

	Actual After Tax Income	Official Social Minimum	Subjective Income Threshold	Confidence Interval for Subjective Threshold	
1 person, <65	Dfl22,922	Dfl12,890	Dfl17,173	Dfl15,182	Dfl19,164
1 person, > = 65	21,048	13,173	22,498	16,545	28,447
2 persons, <65[a]	37,952	18,788	22,025	19,028	25,020
2 persons, > = 65[a]	32,631	18,822	21,707	16,767	26,650
3 persons	33,487	19,731	23,753	20,497	27,006
4 persons	38,516	21,616	25,984	22,451	29,517
5 persons	41,528	23,554	29,177	24,821	33,533
6 or more persons	46,580	26,292	34,419	27,995	40,843
Total	34,930	19,229	23,536	20,169	26,903

[a]Age of main breadwinner.

the Netherlands. Moreover, we present approximate confidence intervals for the means of our subjective thresholds, computed using a well-known result on the asymptotic distribution of functions of least squares estimators (Judge *et al.*, 1980). All reported values are weighted using our samples and their respective population weights.

It can be concluded that the levels of the subjective income cut-offs in the U.S. are significantly above the official poverty thresholds. For most household size groups, the mean subjective thresholds are more than twice the official poverty thresholds. In the Netherlands the subjective thresholds are also above the official minimums, the difference being significant in all but one of the groups; however, in general the difference is clearly smaller and amounts to approximately 20 per cent. In contrast, for both countries, the thresholds lie in the range of 60 to 75 per cent of the mean incomes in most family size groups. The confidence intervals

appear to be rather wide; this finding alone should make one cautious concerning the use of these thresholds.

The percentage of households or consumer units below the subjective thresholds and below the official thresholds are presented in Table 4. Again, we limit ourselves to the general picture which shows that both sets of percentages are clearly higher in the U.S. than in the Netherlands. This is indicative of the fact that the lower tail of the income distribution in the U.S. is clearly thicker than in the Netherlands, probably as a consequence of the elaborate system of government transfers in the latter country, among other reasons. It should be added, however, that for the Netherlands, the presented percentages of poor according to the official social minimums are an underestimation of the real percentages (see C.B.S., 1984), and that revisions in the system after 1983 have forced more households to the social minimums.

TABLE 4

PERCENTAGES OF POPULATIONS WITH INCOMES BELOW THE OFFICIAL AND SUBJECTIVE INCOME THRESHOLDS BY FAMILY SIZE: U.S. (1982) AND THE NETHERLANDS (1983)

	U.S.			Netherlands		
	Percentage Distribution ($n = 3520$)	Below Official Poverty Threshold	Below Subjective Income Threshold	Percentage Distribution ($n = 10389$)	Below Official Social Minimum	Below Subjective Income Threshold
1 person, <65	20.7	19.5	47.6	9.4	10.3	26.1
1 person, >=65	7.8	27.7	78.7	0.6	0.6	57.5
2 persons, <65[a]	19.3	8.0	28.6	26.5	5.2	13.4
2 persons, >=65[a]	8.0	8.3	52.7	3.3	6.4	15.8
3 persons	16.4	10.0	36.9	17.7	5.0	17.0
4 persons	14.7	8.7	32.3	31.6	2.2	10.2
5 persons	7.5	11.1	41.1	9.0	1.8	12.1
6 or more persons	5.6	32.1	45.0	1.9	3.3	25.3
Total	100.0	14.0	42.2	100.0	4.5	17.1

[a]Age of reference person (U.S.) or main breadwinner (NL).

The percentages for the subjective thresholds in the different family size groups show that in both countries single persons above age 65 are particularly at risk. However, given the respective thresholds and confidence intervals, the percentages for the Netherlands in this group should not be taken too seriously since they are based on rather few observations. Yet the large percentage of elderly one person consumer units in the U.S. below the subjective income threshold may signal a serious problem. The percentages of younger singles and elderly couples in the U.S. below their respective subjective income thresholds are also above the population average. In the Netherlands subjective income poverty is highest for singles.

The percentages for the official thresholds reveal a mixed picture for the U.S. and the Netherlands. Singles in the U.S., regardless of age, are more likely

than the average to have incomes that place them below the official poverty thresholds. In contrast, elderly two person consumer units have incomes which result in poverty rates below the average. Younger singles in the Netherlands are the most likely to be poor according to the official social minimum.

3.3. *Additional Results*

Inclusion of the log(fixed expenditures) in the regression of log (Y_{min}) results in highly significant coefficients for this variable in both countries, 0.070 and 0.119 for the U.S. and the Netherlands, respectively (results not shown). The adjusted R^2 increases to 0.504 for the U.S. regression and to 0.360 for the Netherlands. Compared to those presented in Table 1, most of the estimated coefficients of the other variables are only affected to a minor extent. The only coefficients which undergo a major change are the coefficients of income, resulting in clearly lower estimates of the income elasticity of the reported minimum, 0.377 for the U.S. and 0.458 for the Netherlands. Obviously, to a large extent the correlation between income and fixed expenditures is responsible for this effect. Nevertheless, the fact that these expenditures have a distinct influence on the minimum income, in addition to income, seems to indicate that people take these expenditures into account when answering the MIQ. Whether or not this should result in adaptation of the computed poverty lines is open to question; yet, in any case it provides an additional argument against using the intersection of the relationship (1) with the line $Y_{min} = Y$ as the poverty line without further consideration. The basic idea underlying this intersection, that people with high incomes overestimate their needs, is only correct to the extent that they are able to adapt their expenditure patterns to lower incomes. The questions one should answer are if and to what extent these expenditures should really be considered fixed when one wants to define poverty. Incidentally, the notion that fixed expenditures should be taken into account in policy with respect to low income groups is not new. In both the U.S. and the Nethelands, housing subsidies are provided for households with low incomes.

We should finally point out that no firm conclusion may be drawn from the fact that the coefficient of fixed expenditures is clearly lower in the U.S. than in the Netherlands. Although the fixed expenditures elasticity of minimum income is lower in the U.S., further computations reveal that on average, the absolute effect of adding a fixed amount to expenditures on minimum income is probably even higher in the U.S. than in the Netherlands.

An additional analysis (results not shown) of the Dutch data reveals that households which have recently suffered a considerable decrease in their incomes report significantly higher minimum incomes than do households with stable incomes. Again, this indicates that households may encounter problems in adapting their expenditure patterns to lower incomes. Hence, if one wants to compute poverty lines from answers to the MIQ, once more the question must be answered whether these problems should be taken into account or whether the poverty lines should be computed on the basis of the answers of households with stable incomes.

4. Discussion and Conclusion

From the analysis in the foregoing section, some general conclusions may be drawn concerning the questions we ask in the introduction to this article. First, the regression of log (Y_{min}) on log (Y) and a series of differentiating factors yields fairly comparable results for the U.S. and the Netherlands, despite differences in government policy with respect to poverty and social security. In both countries the concept of minimally necessary income is relative, although the effect of income is somewhat lower in the U.S. than in the Netherlands. Since the coefficients of most other variables are somewhat higher in the U.S., social factors (e.g. education) seem to play a larger part in determining one's minimally necessary income there. On average, the subjective thresholds based on the regression of log (Y_{min}) are considerably above the official poverty lines, but more so in the U.S. than in the Netherlands. Relative to the mean incomes, the average subjective thresholds in both countries are in the same range. The percentages of the population below the thresholds are considerably higher for the U.S. than they are for the Netherlands, both according to the official and the subjective definitions. In the U.S., the subjective percentages are highest among the elderly. Moreover, in both countries, singles and large households reveal relatively high probabilities of being below their respective thresholds. Further analysis reveals that fixed expenditures have a significant effect on the reported minimal needs. However, questions remain concerning whether and how the effects of fixed expenditures, as well as those of, e.g. reference groups and other variables not objectively causing different needs, should be taken into account in defining poverty or in determining a minimally necessary income for individuals and families. For example, higher educated people are likely to relate a different life style to the minimally necessary income than are lower educated people, thus the question arises whether we can derive a socially and politically acceptable definition of poverty. The problem is related to the comparison of poverty lines between different countries, but now in addition, concerns different poverty lines within one society. When the differences in the reported minimum incomes reflect real cost differences, for example, due to regional price differences, differences in the poverty lines do not seem unrealistic. However, when reported minimum incomes appear to be related to different welfare levels, we may have a problem.

Appendix 1

Correction for the Omission of Income Components

The relationship (1), which we want to estimate, implies that the answers to the MIQ are supposed to be highly dependent on household income,

$$\log (Y_{min}) = a_0 + a_1 \log (Y). \tag{1}$$

However, it is highly likely that the answers will be more related to the picture of the incomes respondents have in mind, their anchor incomes, than to their actual household incomes. For example, when they find their own current financial positions to be just sufficient to make ends meet, they may report estimates of their current incomes which deviate from their actual incomes. It is clear that

ignoring this possible effect would result in the computation of incorrect values for the coefficients of equation (1) and resulting poverty lines. To correct for the omission of income components, we follow an approach develop by Homan (1988), and estimate the weights of the income components in the anchor income from a preliminary estimation of a nonlinear version of (1) with only log (family size) as an explanatory variable apart from income.

The underlying idea is as follows: the relationship (1) is supposed to prevail between the actual Y_{min} and the actual Y. Furthermore, we suppose that if the anchor income, Y_{anc}, underestimates Y by a certain percentage, the reported minimally necessary income, Y_{minr}, also underestimates Y_{min} by this percentage:

$$Y_{minr}/Y_{min} = Y_{anc}/Y \tag{2}$$

or

$$\log(Y_{minr}) - \log(Y_{min}) = \log(Y_{anc}) - \log(Y).$$

Substituting (2) in (1) we get

$$\log(Y_{minr}) = a_0 + (a_1 - 1)\log(Y) + \log(Y_{anc}). \tag{3}$$

In Y_{anc} we suppose that the income of the main breadwinner, Y_h, is fully taken into account, but that other income, for example, of the partner, Y_p, and others in the household, Y_n, are counted only partially:

$$Y_{anc} = Y_h + a_p Y_p + \ldots + a_n Y_n. \tag{4}$$

After substituting (4) into (3) and adding log (family size), this equation is estimated to find the weights $a_p, \ldots, a_n$. These weights are kept fixed when we finally add the other variables (e.g. household composition, age, education) and renew our estimates of (3). The weights in (4) are not re-estimated since these are very sensitive to the household composition variables added to (3), and re-estimating them would result in implausible figures. Although this procedure may not perhaps seem satisfactory from a methodological point of view, we have nevertheless chosen to present the results which we think certainly merit attention.

The resulting weights of the respective components in anchor income, which are restricted to values between zero and one, are presented in Table A1. In this table we are confronted with the first differences between the two countries. In the Netherlands, the income of the spouse only partially counts in the anchor income; this could result because it is foreseen that the partner will leave the labor market in the near future (approximately 40 per cent of the two earner households report that this is likely, for example, in order to raise children). In the U.S. the income of the partner is fully taken into account.This difference probably is a consequence of the still very prominent role of the one earner family in the Netherlands, where traditionally it is the position of the main breadwinner (and his income) which determines the social status of the household, and where the tax system and the lack of nurseries and day care facilities still are obstacles on the way to an equal participation of both partners in the labor market. The fact that the income of the partner receives a weight of one in the U.S. also reflects that, contrary to the Netherlands, the income of the partner is fully taken into account in the way households live. In the Netherlands, where

TABLE A1

ESTIMATED COEFFICIENTS OF ANCHOR INCOME

	U.S. (1982) ($n = 3520$)		Netherlands (1983) ($n = 10389$)	
	Weight	Asymptotic Standard Error	Weight	Asymptotic Standard Error
Income of main breadwinner	1.000[a]	—	1.00[a]	—
Income of spouse	1.000	0.051	—	—
Income of spouse				
– permanent	—	—	0.811*	0.024
– temporary	—	—	0.505*	0.026
Income of children	0.801*	0.084	0.775*	0.099
Income of other household members	0.728*	0.080	—	—
Food stamps	0.780	0.201	—	—
Food and rent as pay	0.435	0.413	—	—
Holiday allowance	—	—	0.240*	0.091
Other household income	0.812*	0.043	0.453*	0.048

*Significantly different from 1 ($p = 0.05$).
[a]Fixed at 1.

the female partner generally works only part-time, her income is often considered as welcome extra, but in the U.S. it more often has to be fully used for normal household expenditures. Only the incomes of the children and other household members, and total other household income have weights statistically significantly different from one in the U.S. These incomes may not fully be used to finance the communal household expenditures, or may be neglected due to their irregular character.

APPENDIX 2

CORRECTION FOR BIAS DUE TO SELECTIVE NON-RESPONSE

The other phenomenon for which we correct is the possibility of getting biased estimates due to selective non-response. Kapteyn, Kooreman, and Willemse (1988) were the first to incorporate this possibility in the computation of subjective poverty lines, following a host of literature on selectivity bias in other fields (see, e.g. Maddala, 1983).

We include in our regression a variable to correct for the potential bias due to selective non-response to the MIQ and related variables. For the U.S. sample, a non-response results when the respondent does not answer the MIQ or associated time period question, reports less than $1000 annual income, or does not report income from major sources such that the consumer unit is identified by BLS as an incomplete income reporter. For the Dutch sample, non-response results when the respondent does not answer the MIQ or does not provide adequate information to compute annual household income.

We perform a probit estimation on the non-response to obtain a correction for selectivity bias. As explanatory variables, X, in this equation we include age, age^2, family size, and dummy variables for education and self-employment status

of the reference person, the number of earners in the household and in the U.S., indicators of the region in which the household lives. The coefficients, β, are estimated using maximum likelihood. Then we add

$$C(X) = \text{norm}(\hat{\beta}'X)/p\text{norm}(\hat{\beta}'X) \tag{5}$$

to the explanatory variables in the regression of $\log(Y_{\min})$, where norm (t) and $p$norm (t) represent the values of the probability density function and the cumulative distribution function, respectively, of the standard normal distribution in t (see Maddala, 1983).

Table A2 presents the results of the probit estimation. With respect to age, in the Dutch dataset the response is highest at the age of about 30 (all else equal),

TABLE A2

RESULTS OF PROBIT ANALYSIS ON NON-RESPONSE

	U.S. (1982) ($n = 4830$)		Nethelands (1983) ($n = 13730$)	
	Coefficient	Asymptotic Standard Error	Coefficient	Asymptotic Standard Error
Intercept	0.986*	0.147	0.793*	0.133
Age/10	−0.167*	0.066	0.185*	0.067
Age^2/1000	0.112	0.068	−0.324*	0.073
Family size	0.002	0.015	−0.069*	0.011
Low education	−0.031	0.064	−0.060	0.031
High education	0.048	0.043	−0.133*	0.028
Self-employed	−0.464*	0.073	−0.501*	0.068
1 earner	0.132*	0.061	0.205*	0.042
2 earners	0.257*	0.069	−0.045	0.041
3 or more earners	0.220*	0.089	—	—
Northeast	−0.196*	0.054	—	—
Midwest	0.035	0.054	—	—
West	0.105	0.056	—	—
Log(likelihood)—unrestricted	−2749.19		−7181.66	
Log(likelihood)—intercept only	−2822.99		−7381.53	
Pseudo R-Square[a]	0.026		0.027	

*Significantly different from 0 ($p = 0.05$).

[a]Calculated as $1 - (\log L_{\text{unrestricted}})/\log L_{\text{intercept only}})$.

which implies that mainly in the highest age groups the response decreases. Also, from earlier research on the same data it has appeared that the MIQ as asked in the Dutch survey is rather difficult for older people. In the U.S. the response reaches a minimum at about 75, which likewise may indicate difficulty in responding to income related questions. Higher educated respondents in the Netherlands tend to be somewhat less responsive than the other education groups. Education does not have a significant effect on response for the U.S. sample. A clearly negative effect on response in both surveys results from the dummy variable indicating a self-employed breadwinner. Here the lack of a monthly (or weekly) wage slip, and, more generally, difficulties in measuring their actual incomes

may have caused problems with respect to the income information. Family size has a significantly negative effect on response in the Netherlands, but not in the U.S. In the U.S. the response was significantly lower in the northeastern region of the country. Finally, the number of earners in a household has a significant effect on response.

Despite these significant effects, it should once again be stressed, that for the most part, these effects represent only marginal differences in non-response. Therefore, it does not come as a surprise when the selectivity correction factors, constructed from the probit equation as noted in (5), do not have significant effects in the regressions of $\log(Y_{\min})$. Inclusion of these estimated correction factors means that the usual method to compute standard errors for the OLS estimates produces biased results [both underestimation and overestimation are possible; see Heckman (1979) and Greene (1981)]. To avoid further complications, following Lee (1978) and Homan (1988), we have not corrected for this bias.

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