

## GENDER, POVERTY AND THE INTRA-HOUSEHOLD DISTRIBUTION OF RESOURCES

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Most empirical studies of poverty assume an equal sharing of resources between all household members. There is a growing body of research indicating that this assumption is not realistic. This paper explores how the unequal sharing of resources could potentially affect the measurement of poverty. Simulations based on micro-data from two countries (Italy and the U.S.A.) are carried out under the assumption that women "lose" and men and children "gain" because of unequal sharing in the household. Our findings suggest that if there is significant intra-household inequality of this type, as some writers have suggested, then conventional methods of poverty measurement will likely lead to a *serious* under-estimate (over-estimate) of the incidence and intensity of female (male) poverty.

### INTRODUCTION

Most empirical studies of poverty assume an equal sharing of resources between all household (or family) members. In such studies, household members are assumed to "pool" their individual resources (e.g. earnings, government transfers and unearned income) and these pooled resources are redistributed equally based on need. A household is defined as being poor if its average level of resources falls below the poverty standard. In turn, an individual is poor if he or she is a member of a poor household. As Glendinning and Millar (1988:5) point out, most empirical studies of poverty assume that: "[L]evels of consumption and living standards of all household members are also broadly similar: i.e. poverty and plenty are both equally shared and that poverty is only experienced by those individuals living in poor households."

Numerous authors have argued that the equal sharing of resources assumption is not realistic. There is a strong belief that significant inequality exists within the household, with resources not being shared equally between men, women and children (Charles and Err, 1987; Daly, 1992; Ehrenreich, 1986; Glendinning and Millar, 1988; Haddad and Kanbur, 1990; Lazear and Michael, 1986; Millar and

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Glendinning, 1989; Pahl, 1983, 1989; Rimmer, 1981; Vogler, 1989; Young, 1952). Furthermore, it is often argued that women are not receiving their “fair share” of available household resources (see especially, Pahl; 1983, 1989). If this is true, then some women residing in “non-poor households” may in fact be “poor.” Likewise, some men residing in “poor households” may not be “poor.” If the unequal sharing of resources is occurring, then conventional methods of poverty measurement will lead to an *under-estimate* of female poverty and an *over-estimate* of male poverty. Despite this, little attention has been directed towards empirically modelling the intra-household distribution of resources in the measurement of poverty (Jenkins, 1991).

The exception to this statement are two recent studies by Borooah and McKee (1993) and Davies and Joshi (1992). Borooah and McKee (1993), using British data from the 1985 *Family Expenditure Survey*, examine the effect of unequal sharing on male-female poverty rates by considering three possible sharing patterns. The first is *equal sharing* based on per capita income. The second is *equal sharing based on need*, where need is defined in terms of equivalence scales. The third pattern is *unequal sharing*, where market income is distributed based on a 70 percent/30 percent male-female split. They find that the patterns of poverty changes considerably when unequal sharing is assumed. More specifically, for a poverty line set at two-thirds of mean equivalent income, they find that with equal sharing 33 percent of married couples are poor. However, with the 70 percent/30 percent sharing arrangements, 66 percent of married women and 14 percent of married men are poor.

A similar conclusion is reached by Davies and Joshi (1992) using British data from the 1968 and 1986 *Family Expenditure Surveys*. Their analysis consists of contrasting two sharing patterns: (1) *equal sharing based on need*, and (2) *minimum sharing*. Minimum sharing is defined as a situation where only the costs of housing are shared and individuals only consume income that they directly bring into the household. Households which contain individuals with zero or negative net incomes on the *minimum sharing* assumption are excluded from the analysis. For an arbitrary poverty line, they find that under the equal sharing of resources, 15 percent of married couples in 1986 are poor. However, under the assumption of the minimum sharing of resources, 52 percent of married women and 11 percent of married men are poor.

Following Borooah and McKee (1993) and Davies and Joshi (1992), this paper also explores how the unequal sharing of resources could potentially affect the measurement of poverty. There is little reliable information available that accurately describes the sharing of resources in the household e.g. survey data (see Jenkins, 1991). Therefore, the approach that we use to introduce “inequality” (i.e. unequal sharing) in the household is based on simulation. In these simulations, we relax the assumption that individual household members are allowed to keep their “fair-share” of resources (i.e. what they are assumed to get under the equal sharing of resources assumption). The simulations are based on nationally representative micro-data from two countries (described below) and a specific set of assumptions concerning the size and direction of transfers between different household members. Based on these assumptions, male and female poverty shares are calculated. The comparison of the poverty shares based on the equal sharing

of resources to those based on the unequal sharing of resources (obtained through simulation), provides some information about how the unequal sharing of resources could potentially affect the measurement of poverty. However, this approach does *not* provide any “new” evidence on what actually happens in the household in terms of resources flows. In other words, we are *not* measuring the extent of unequal sharing but simply trying to evaluate the potential impact that unequal sharing has on the measurement of poverty.

The simulations are carried out separately for Italy and the U.S. The reason for selecting these two countries is that they represent the two extreme positions on a spectrum consisting of ten countries that were available to us at the time of writing (Australia, Canada, France, Germany, Italy, Luxembourg, Netherlands, Poland, Great Britain, U.S.A.). Under the equal sharing of resources assumption, these two countries have quite different gender distributions of poverty. At one end of this spectrum is Italy, where women are slightly “under-represented” amongst the poor. At the other end of the spectrum is the U.S., where women are severely “over-represented” amongst the poor. It is not clear why these countries differ so markedly in this respect (see Wright, 1995). Although it would be desirable to understand the reasons behind these differences, such an understanding is not central to this paper. We are concerned with the impact of the unequal sharing on the measurement of poverty, not with explaining why the gender distribution of poverty is different across countries when the equal sharing of resources is assumed. We believe that the former can be more effectively achieved by comparing two countries with quite different “initial” gender distributions of poverty.

The paper proceeds as follows. In the first section, a framework that can be used to incorporate information about the intra-household distribution of resources in the measurement of poverty is described. In this section, the procedures used to identify poor households and individuals are outlined. In section 2, the specific poverty measures calculated are described. An index is used that is additively decomposable with population share weights and is consistent with Sen’s influential axiomatic approach to poverty measurement. With this index it is possible to decompose the total amount of poverty into male and female shares thereby providing a concise summary of the gender distribution of poverty. In the third section, micro-data from the *Luxembourg Income Study* for Italy and the U.S. are used to examine how the gender distribution of poverty varies depending on assumptions relating to the sharing of resources within the household. The estimates based on equal and unequal sharing are presented in the fourth section. Conclusions and suggestions for future research follow in section 5. Overall, the analysis illustrates the importance of paying attention to the intra-household distribution of resources when examining the relationship between gender and poverty.

## I. IDENTIFYING THE POOR

If we define economic well-being as the ratio of economic resources to need, then an individual is “poor” if the resources available to them do not meet their needs at a designated level relative to social standards. Most empirical studies of

poverty employ *disposable equivalent household income* as the empirical counterpart to economic well-being. The household's economic resources are assumed to be determined by its total disposable income, which is equal to the income of all household members from all sources minus income taxes and other mandatory deductions (i.e. income available for consumption by household members). It is clear that there are economies of scale in consumption relating to household size. Likewise, there are differences in consumption patterns between children and adults. Disposable income should be adjusted to reflect these differences. This adjustment is usually carried out by assuming that the household's needs are a function of the number and ages of its members. Equivalence scales are then used to adjust disposable income to account for differing needs.

Under the assumption of the equal sharing of resources, a household is poor if its equivalent disposable income,  $Y_i$  is below the "poverty line,"  $Y^*$ . In this paper, the so-called "households below average income" (HBAI) approach is used to select the poverty line. With this approach, the poverty line is set at a fraction,  $\rho$ , of the mean level of income,  $\bar{Y}$ . This is:  $Y^* = \rho \bar{Y}$ . Therefore, a household is poor if its income is below this level. In turn, an individual is poor, if he or she is a member of a poor household is:

$$(1) \quad \text{If } Y^* - Y_i > 0 \quad \text{then } P_i = 1$$

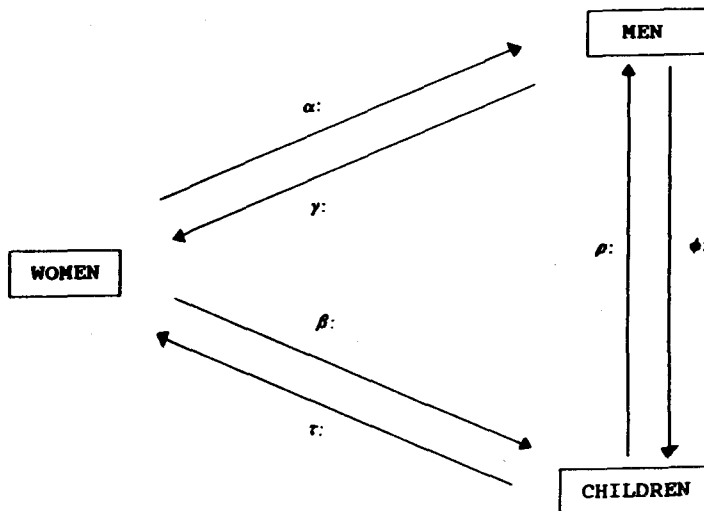
where  $P_i$  is an indicator variable that takes the value of 1 if an individual is poor and 0 if not. It is important to note that there are numerous advantages and disadvantages associated with using the HBAI approach to select the poverty line. These are described in detail in Atkinson (1987). Selecting the poverty line is a difficult, and often arbitrary, task. However, the HBAI approach is gaining popularity. For example, it is used in the *European Poverty Programmes*, and forms the basis of official poverty statistics in many countries. Finally, it should be stressed that the framework described below is not dependent on the HBAI approach—this approach is used simply to set the poverty line.

Under the equal sharing of resources, the poverty rate or percentage,  $P$ , is simply:

$$(2) \quad P = (1/n) \sum_{i=1}^n P_i$$

where  $n$  is the number of individuals in the population.

As mentioned above, if the unequal sharing of resources is occurring within households, then  $P$  will not be an accurate estimate of the incidence of poverty in the population. One way to conceptualise inequality within the household is in terms of transfers of resources between different "types" of household members. A useful starting point is to think in terms of three main groups of individuals: (1) *adult men*; (2) *adult women*; and (3) *children*. Since there are three groups of individuals, there are six possible directions in which resources between individuals may flow. These are shown in Figure 1. The parameters  $\alpha$  and  $\beta$  represent transfers from adult women to adult men and children respectively. The parameters  $\gamma$  and  $\phi$  are transfers from adult men to adult women and children. Finally,  $\tau$  and  $\rho$  are the parameters representing the transfers from children to adult women and from children to adult men. The parameters represent how much an individual



**Parameters**

	<u>From:</u>	<u>To:</u>
1.	$\alpha$ : Women	→ Men
2.	$\beta$ : Women	→ Children
3.	$\gamma$ : Men	→ Women
4.	$\phi$ : Men	→ Children
5.	$\tau$ : Children	→ Women
6.	$\rho$ : Children	→ Men

Figure 1. Intra-household Resource Flows

gains or loses due to inequality within the household relative to what they are entitled to if there is equal sharing of resources.

The framework can be used to incorporate information about intra-household inequality into the measurement of poverty. More formally, let  $Y_i$  be the level of income that individual “ $i$ ” is entitled to based on the equal sharing of resources assumption (i.e. equal sharing of disposable *equivalent* income). Let  $Y_i^a(w)$  be the adjusted level of income received by adult women after transfers to and from adult men and children have been made. We may write this amount in terms of the transfer parameters defined above. That is:

$$(3a) \quad Y_i^a(w) = (1 - \alpha - \beta + \gamma + \tau) \cdot Y_i$$

or

$$(3b) \quad Y_i^a(w) = \sigma(w) \cdot Y_i$$

where  $\sigma(w)$  is the “net transfer parameter” for adult women.<sup>1</sup> Clearly if women

<sup>1</sup>These transfer parameters are subject to the following constraints that is if  $x = \alpha, \beta, \gamma, \phi, \tau$  and  $\rho$  then: (1)  $0 \leq x < 1$  and (2)  $0 \leq (\alpha + \beta) < 1$ ;  $0 \leq (\gamma + \phi) < 1$  and  $0 \leq (\tau + \rho) < 1$ . These constraints imply that all transfers are positive and all individuals must keep some of their resources for personal consumption.

are receiving (for whatever reasons) less than they are entitled to under the equal sharing of resources assumption, then  $\sigma(w) < 1$ . It follows that women are poor if the *adjusted* income falls below the poverty line. That is:

$$(3c) \quad \text{If } Y^* - Y_i^a(w) > 0 \quad \text{then } P_i^a(w) = 1$$

where  $Y^*$  is the poverty line and  $P_i^a(w)$  an indicator variable equal to 1 if she is “individually poor” and 0 if she is not. It is important to note that if  $\sigma(w) < 1$  and  $Y_i > Y^*$ , women may in fact be “poor” but do not reside in “poor households.” Therefore, the poverty rate for women is:

$$(3d) \quad P_w = (1/n_w) \sum_{i=1}^{n_w} P_i^a(w)$$

where  $n_w$  is the number of adult women in the population.

A similar resource quantity can be defined for adult men. Let  $Y_i^a(m)$  be the adjusted level of income for adult men in the household after transfers to and from adult women and children. In terms of the transfer parameters defined above, we may write this amount of income as:

$$(4a) \quad Y_i^a(m) = (1 - \gamma - \phi + \alpha + \rho) \cdot Y_i$$

or

$$(4b) \quad Y_i^a(m) = \sigma(m) \cdot Y_i$$

where  $\sigma(m)$  is the net transfer parameter for adult men. If  $\sigma(m) > 1$  then adult men are receiving more resources than they are entitled to under the equal sharing of resources assumption. It follows that adult men are poor if their adjusted income falls below the poverty line. That is:

$$(4c) \quad \text{If } Y^* - Y_i^a(m) > 0 \quad \text{then } P_i^a(m) = 1.$$

Again it is important to note that if  $\sigma(w) > 1$  and  $y_i < y^*$  adult men may in fact be residing in “poor households” but are not “individually poor.” Therefore, the adjusted male poverty rate is:

$$(4d) \quad P_m = (1/n_m) \sum_{i=1}^{n_m} P_i^a(m)$$

where  $n_m$  is the number of adult men in the population.

Finally, the adjusted income for children after transfers to and from adult men and women may be written:

$$(5a) \quad Y_i^a(c) = (1 - \tau - \rho + \beta + \phi) \cdot Y_i$$

or

$$(5b) \quad Y_i^a(c) = \sigma(c) \cdot Y_i$$

with the poverty condition:

$$(5c) \quad \text{If } Y^* - Y_i^a(c) > 0 \quad \text{then } P_i^a(c) = 1.$$

The adjusted child poverty rate is:

$$(5d) \quad P_c = (1/n_c) \sum_{i=1}^{n_c} P_i^a(c)$$

where  $n_c$  is the number of children in the population.

The problem with this approach, of course, is that data describing the magnitudes of these transfer parameters are rare (Jenkins, 1991). In the absence of accurate data, an alternative approach is to select a series of values and then calculate male, female and child poverty rates based on these selected values—a form of simple simulation. This requires two assumptions that are described in detail below. The first assumption concerns the “direction” of resources flows in the household—who gains and who loses from unequal sharing? The second assumption concerns the magnitude of resource flows—how much do individuals gain and lose? By varying these assumptions, and by comparing the “unadjusted” and “adjusted” poverty rates, one can examine how sensitive conventional estimates of poverty are to changes in sharing patterns. This approach, albeit crude, could potentially provide useful information on how the unequal sharing of resources affects the measurement of poverty.

## II. SUMMARISING POVERTY

The above discussion focused on the “incidence” dimension of poverty. However, poverty is multi-dimensional and these dimensions should be incorporated into summary indices of poverty. Sen (1976) described three properties that a good summary index of poverty should possess. The first is that the index must be sensitive to the relative number of poor, capturing the *incidence of poverty*. The second is that the index must be sensitive to the average level of income of poor, indicating their *average deprivation*. The third is the index must be sensitive to the distribution of income among the poor, indicating their degree of *relative deprivation*. Unfortunately most measures of poverty that incorporate Sen’s axiomatic requirements (including Sen’s own measure) are not decomposable (see Hagenaars, 1987). For our purposes this is problematic since we want to decompose the “total” amount of poverty into male and female “shares.” As is described below, these shares provide information about the gender distribution of poverty.

The measure used here, which is decomposable, is due to Foster, Greer and Thorbecke (1984) (hereafter referred to as the FGT measure). This measure,  $P(\lambda)$ , may be defined:

$$(6) \quad P(\lambda) = (1/n) \sum_{i=1}^q \left[ \frac{Y^* - Y_i}{Y^*} \right]^\lambda$$

where:  $y^*$  is the poverty line;  $y_i$  is the household income of individual  $i$ ;  $i$  is the number of poor individuals in the population ( $y_i < y^*$ ); and  $n$  is the total number of individuals in the population. The parameter  $\lambda$  takes on a value greater than or equal to zero ( $\lambda \geq 0$ ). As  $\lambda$  gets larger, the measure becomes more sensitive to the income circumstances of the poor.

If  $\lambda=0$  then  $P(0)=H=q/n$ . This is the “head-count ratio,” which is simply the proportion of population who have income below the poverty line (i.e. the incidence of poverty). If  $\lambda=1$  then  $P(1)=H \cdot I$  where  $I=(Y^* - \bar{Y}_p)/Y^*$  where  $\bar{Y}_p$  is the average income of the poor. This is a renormalisation of the “income-gap ratio,” which captures the average income shortfall of the poor. If  $\lambda=2$  then  $P(2)=H[I^2 + (1-I)^2 C_q^2]$ , where  $C_q$  is the coefficient of variation of income among the poor. Since  $C_q$  is a commonly used measure of income inequality, its inclusion in the measure captures the relative deprivation of the poor.

A useful feature of the FGT measure is that it is additively decomposable with population share weights. More specifically, we may write this index as:

$$(7) \quad P(\lambda) = (n_w/n) \cdot P(\lambda)_w + (n_m/n) \cdot P(\lambda)_m$$

where the subscripts “w” and “m” denote female and male respectively. The ratios  $n_w/n$  and  $n_m/n$  are the population shares of adult females and males ( $n_w/n + n_m/n = 1$ ).  $P(\lambda)_w$  and  $P(\lambda)_m$  are the FGT poverty measures calculated separately for females and males. If we think of  $P(\lambda)$  as being the “total” amount of poverty in the population, then the female and male shares of this total are:

$$(8) \quad S(\lambda)_w = (n_w/n) \cdot P(\lambda)_w / P(\lambda)$$

and

$$(9) \quad S(\lambda)_m = (n_m/n) \cdot P(\lambda)_m / P(\lambda)$$

It follows from equations (8) and (9), if poverty is “equally shared” between women and men, each group’s poverty share would equal their population share. That is:

$$(10) \quad S(\lambda)_m = (n_m/n)$$

and

$$(11) \quad S(\lambda)_w = (n_w/n).$$

If on the other hand  $S(\lambda)_m > (n_w/n)$  then poverty is not “equally shared” between men and women, with women being “over-represented” in the ranks of the poor. A convenient way of summarising how “over-represented” women are in poverty is simply how much their poverty share exceeds their population share. For example, the ratio of female poverty share to the female population share.

For reasons discussed above, if there is unequal sharing then male and female poverty rates and shares will change. All the above quantities can be easily calculated by substituting into the equations the adjusted poverty rates. By comparing the poverty rates and shares that incorporate information about the unequal sharing of resources, one can see what difference inequality within the household makes.

### III. DATA

In this section, FGT poverty rates and shares are calculated for two countries—Italy and the U.S.—in order to examine how estimates of poverty vary



depending on different assumptions about the sharing of resources in the household. These data-sets form part of the *Luxembourg Income Study*.<sup>2</sup> The source of the Italian data is the *Bank of Italy Income Survey*. This survey was carried out in 1986 and has an unweighted sample size of 8,022 households. The source of the American data is the *March Current Population Survey*. This survey was carried out in 1985 and has an unweighted sample size of 11,614 households. All estimates presented below are weighted in order to reflect population totals.

Total disposable income is used to represent the household's level of resources. This is equal to the gross yearly income of all household members from all sources, minus income taxes and other mandatory deductions. Gross yearly income includes: earnings from wages and salaries; earnings from farm and non-farm self-employment; sick pay; accident pay; disability pay; maternity allowances; military, veterans and war benefits; other social insurance; social retirement benefits; child and family allowances; unemployment benefits; means-tested cash benefits; all near cash benefits (e.g. market value of food stamps); alimony and child support; other regular private income; private pensions; public sector pensions; cash property income and other cash income. Disposable income is adjusted using equivalence scales in order to take into consideration the different needs of household members. The scales used are the weights recommended by the OECD in its work on social indicators. That is, the first adult in the household has a weight of 1.0; each additional adult has a weight of 0.7; and each child has a weight of 0.5.

It is important to note that it is possible for households to report negative or zero income. In the Italian dataset, there were two households that reported negative/zero income and in the American dataset there were 69 households. After weighting, this represents about 0.02 percent of Italian households and 0.5 per cent of American households. In both cases, the income of households with negative/zero incomes was recoded to one unit, which essentially assumes that these households are "poor." With respect to Italy, the estimates reported below were unaffected by this adjustment, given the low number of households with zero/negative incomes. However, for the U.S. this assumption may be problematic, given the larger share of households with zero/negative incomes. In order to explore any biases that resulted from the adjustment used, poverty rates and shares were calculated using only those households reporting positive incomes. Not surprisingly, when the zero/negative income households were excluded, the estimated poverty rates were lower, especially the estimates of  $P(1)$  and  $P(2)$ . However, the simulations based on only households with positive incomes points to the same general conclusions. Therefore, only the results based on the complete sample of households are presented below.

Our analysis focuses on poverty amongst adults only. An adult is defined as an individual age 18 and over. This includes household heads and their spouses, adult relatives (such as grandparents and brothers and sisters of the household head and/or spouse) and unrelated adults. Unfortunately, the LIS data-sets are

<sup>2</sup>The LIS database is housed at the *Centre for Poverty, Population and Policy Studies* in Luxembourg and may be conveniently accessed through the E-mail electronic mail service. Further details can be found in Smeeding *et al.* (1990) or at the following World Wide Web site: [http://gerosun.maxwell.syr.edu:80/lis\\_part/](http://gerosun.maxwell.syr.edu:80/lis_part/).

not structured in such a way to allow for a detailed analysis of how the unequal sharing of resources affects child poverty. Therefore, in the discussion below, we focus on how the unequal sharing of poverty affects the distribution among adult men and women.

It is possible to extract from the data-sets those households which consist of only married couples with children. By carrying out the simulations on this more homogeneous sub-sample, one can explore the possibility that the results are different for these two groups of households. That is, by comparing the results obtained from simulations based on households that only contain married couples with children to those based on all types of households (e.g. married couples with children + childless households + single parent households, etc.). The calculations of the various poverty rates and shares were repeated for this sub-sample in order to see whether there are any differences in the pattern of poverty between couples with children compared to all households combined. One reason for supposing that this might be the case is that the figures for all households contain households consisting of only adults who might be expected to be less likely to be poor than households with children. On the other hand, it may be that there are households with no children but with elderly relatives who have to be maintained and who take some proportion of the income share of the younger adult females in the household, causing them to become poor. In the event, the evidence did not support this view. Any slight differences between the two types of household are discussed briefly in the text but tables and figures are not shown.<sup>3</sup>

The poverty estimates presented in this paper are based on a poverty line set at 50 percent of the mean level of equivalent income in each of the two countries. Therefore, this poverty line is a *relative* poverty threshold, not an *absolute* threshold—no adjustment is made for differences in the price and income levels between Italy and the U.S. The poverty line is relative to the mean income in each country and therefore no adjustments have been made for differences in the cost of living between the two countries. This is the poverty line used in the European Community's *European Poverty Programmes* (see for example, Commission for the European Communities, 1991).

Inequality within the household is generated by the following process:

$$(12a) \quad Y_i^a(w) = (1 - \pi) \cdot Y_i$$

$$(12b) \quad Y_i^a(m) = (1 + 0.25\pi) \cdot Y_i$$

$$(12c) \quad Y_i^a(c) = (1 - 0.75\pi) \cdot Y_i$$

where  $\pi$  ranges from 0 to 0.5 in the reported simulations. If  $\pi = 0$  then there is equal sharing of resources. In our scenarios, the amount that women transfer varies from 0 to 50 percent of the income they are entitled to under equal sharing of resources (i.e.  $0 < \pi < 0.5$ ). As  $\pi$  gets larger, women transfer a larger share of their resources to adult men and children in the household. It is further assumed that 25 percent of the total amount that adult women transfer is transferred to adult men, while 75 percent is transferred to children. These conditions imply that

<sup>3</sup>All tables and figures relating to the "couples with children" estimates are available on request from the authors, or see Findlay and Wright (1994).

adult women “lose” and adult men and children “gain” as an outcome of unequal sharing. This assumption is in broad agreement with the qualitative sociological literature where the view is that women are not receiving their “fair share” of available household resources—the share they would receive under the equal sharing of resources assumption (see especially, Pahl; 1983, 1989). By varying  $\pi$  we are testing the sensitivity of poverty measurement to a large range of estimates of how much women share with other members of the household.

#### IV. ESTIMATES

Table 1 reports the estimates of the three values of the FGT poverty index for all households (i.e.  $\lambda=0, 1$  and  $2$ ) calculated under the assumption of an equal sharing of resources.<sup>4</sup> The estimates suggest that *relative poverty* is higher in the U.S. compared to Italy. All three poverty measures are higher in the U.S. The  $P(0)$  index, or head-count ratio, indicates that about 17.5 percent of adults in the U.S. are poor while the rate in Italy is 17.0 percent. The poverty difference between these two countries is larger than suggested by the head-count ratio when the other two FGT poverty indices are considered. The  $P(1)$  rate in the U.S. is 7.1 and the rate in Italy is 4.5—a difference of almost 50 percent. Likewise, the  $P(2)$  rate in the U.S. is 3.8, which is twice the Italian rate of 1.9. These estimates indicate that when more information about the income circumstances of the poor is incorporated into the measurement of poverty, the poverty gap between Italy and the U.S. becomes larger.

TABLE 1  
MALE-FEMALE POVERTY RATES  
Equal Sharing Assumption  
(All households)

Country	Year	Measure								
		$P(0)$			$P(1)$			$P(2)$		
		Male	Female	Both	Male	Female	Both	Male	Female	Both
Italy	1986	17.5	16.8	17.1	4.6	4.4	4.5	2.0	1.9	1.9
U.S.A.	1985	17.0	22.6	20.0	6.1	8.1	7.1	3.3	4.3	3.8

Turning first to the estimates for Italy, the FGT poverty indices calculated separately for men and women are very similar in magnitude. In fact, the  $P(0)$  and  $P(1)$  rates are slightly higher for men compared to women, and the  $P(2)$  rates are equal. However, the situation is very different in the U.S. The three poverty rates are all markedly higher for women compared to men. This suggests that both the incidence and intensity of poverty is higher for women compared to men in the U.S.

Table 2 presents the intermediate cases of transfers from the female to the rest of the household of 10 percent and 20 percent of her share (all household types). It is clear that the gender-pattern of poverty between the two countries is becoming more similar in the sense that the Italian gender distribution is starting

<sup>4</sup>All poverty rates have been multiplied by a factor of 100 and all poverty shares are expressed as percentages.

TABLE 2  
 MALE-FEMALE POVERTY RATES  
 10% and 20% sharing assumptions  
 (All households)

Country	Year	$P(0)$			Measure $P(1)$			$P(2)$		
		Male	Female	Both	Male	Female	Both	Male	Female	Both
Transfer = 10%										
Italy	1986	16.7	21.2	19	4.4	5.7	5.0	1.9	2.4	2.2
U.S.A.	1985	16.5	25.7	21.4	5.8	9.3	7.7	3.2	4.9	4.1
Transfer = 20%										
Italy	1986	15.4	27.1	21.5	4.1	7.6	5.9	1.8	3.3	2.5
U.S.A.	1985	15.9	30.2	23.5	5.6	11.0	8.5	3.1	5.9	4.5

to get larger, making it more like the American pattern. This is true even for very small rates of income transfer. If we look at Figure 2 we can see that for all measures, as we increase the amount which is transferred away from women, the gap between Italian men and women, in terms of their contribution to poverty, becomes similar to that displayed in the American data.

Table 3 shows the female population and poverty shares. In Italy, the three poverty shares corresponding to the three poverty measures  $P(0)$ ,  $P(1)$  and  $P(2)$  are 50.9 percent, 50.4 percent and 50.6 percent, respectively. These shares are all lower than the female population share of 51.9 percent. The opposite is observed for the U.S. The poverty shares of 60.1 percent, 60.3 percent and 59.8 percent are all much higher than the female population share of 53.2 percent. More generally, these estimates indicate that under the assumption of equal sharing of resources, the gender distribution of poverty is very different in the U.S. and Italy. Italy has a more or less equal gender distribution of poverty, with women being slightly under-represented amongst the poor. However, in the United States, the gender distribution of poverty is very unequal, with women being severely over-represented amongst the poor.

How does the gender distribution of poverty change when inequality is introduced in the household? The results of the simulations are summarised in Figures 2 and 3. Figure 2 shows the poverty rates for men and women. Figure 3 shows the associated male and female poverty shares. As a general remark, the poverty estimates of both Italy and the U.S. change considerably after the data are adjusted in order to reflect the unequal sharing of resources between men, women and children. The estimates of the head-count ratio,  $P(0)$ , indicate that if adult women

TABLE 3  
 FEMALE POVERTY SHARES  
 Equal Sharing Assumption  
 (All households)

Country	Year	PopShare %	Poverty	Share	(%)
			$S(0)_w$	$S(1)_w$	$S(2)_w$
Italy	1986	51.9	50.9	50.4	50.6
U.S.A.	1985	53.2	60.1	60.3	59.8

in the U.S. transfer 25 percent of their income to adult men and children, the percentage who are poor increases from 22.6 percent (i.e. equal sharing) to 32.9 percent, while the male poverty rate decreases from 17.0 percent to 15.5 percent. Even for a transfer of 10 percent the effect is to increase female poverty rates from 22.6 percent to 25 percent. If women transfer 50 percent, the proportion who are poor is 52.8 percent, compared to 15.5 percent of adult men. Likewise, if Italian women transfer 10 percent of their income, their poverty rate increases from 16.8 percent to 21.2 percent, while the male rate decreases from 17.5 percent to 16.7 percent. At a transfer of 25 percent the figures are 16.8 percent to 30.5 percent for women and 17.5 percent to 14.7 percent for men. Similar magnitudes of change are observed for the other two poverty rates,  $P(1)$  and  $P(2)$  (see Figure 2).

The gender distribution of poverty changes dramatically because of these transfers (see Figure 3). The poverty shares based on the  $P(0)$  index, suggest that if American women transfer 50 percent of their income, their poverty share increases from 60.1 percent to 81.0 percent. If Italian women transfer 50 percent, their poverty share increases from 50.9 percent to 82.6 percent. Again, a similar pattern of relative change is observed for the poverty shares based on the other two poverty measures. It is interesting to note that as the amount of income transferred from women to men and children increases, the gender distribution of poverty becomes very similar in the two countries, achieving parity at about an 80 percent female poverty share when 50 percent of income is transferred.

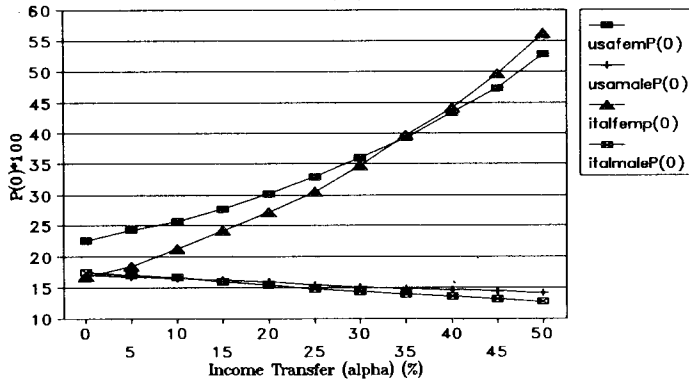
If we now consider the change in female poverty rates and shares for different household types as income is transferred away from women. The estimates suggest that the female poverty rate rises with increased transfers, but it rises more steeply for women in couples with children households. The difference becomes substantial at transfers of 30 percent and over. It should be noted that women who live in couples with children households have a lower share of poverty than for women in all households, but that this difference disappears at a higher rate of income transfer.

In the case of Italy the picture is less striking in terms of the difference between the two types of households. It should be noted however, that unlike American women, Italian women who live in couples with children households, account for a higher share of poverty than for the female population generally. Note also that this difference does not disappear as inequality within the household is introduced. Overall, it would appear that the role of intra-household sharing patterns is critical to the measurement of poverty for all types of households and not simply for couples with children households.

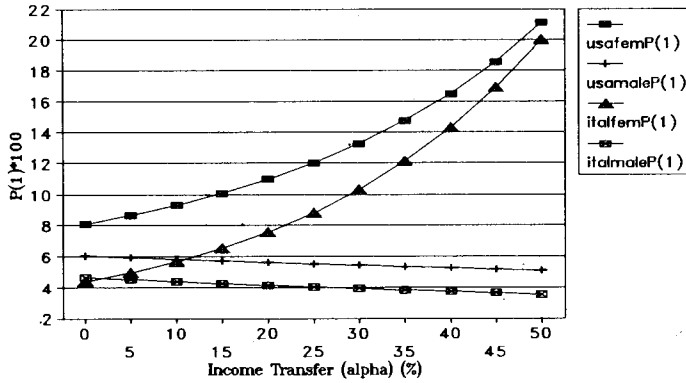
## V. CONCLUSIONS

This paper has explored how the unequal sharing of resources could potentially affect the measurement of poverty. The approach that was followed to "introduce" unequal sharing in the household was based on the simulation of micro-data from two countries that have quite different gender distributions of poverty under the equal sharing of resources assumption. In these simulations,

### Male-Female P(0) Poverty Rates



### Male-Female P(1) Poverty Rates



### Male-Female P(2) Poverty Rates

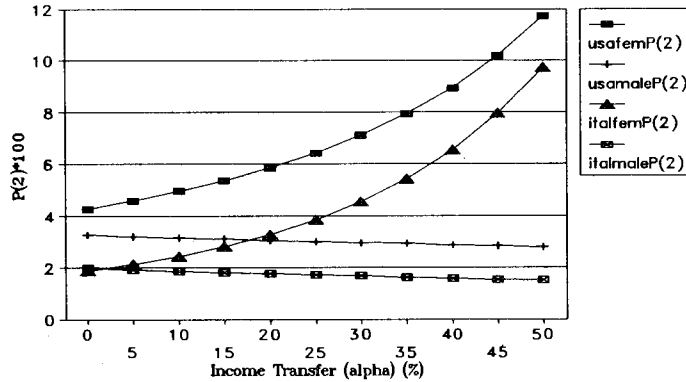


Figure 2. Male-Female Poverty Rates U.S.A. and Italy 1985/6 (All Households)

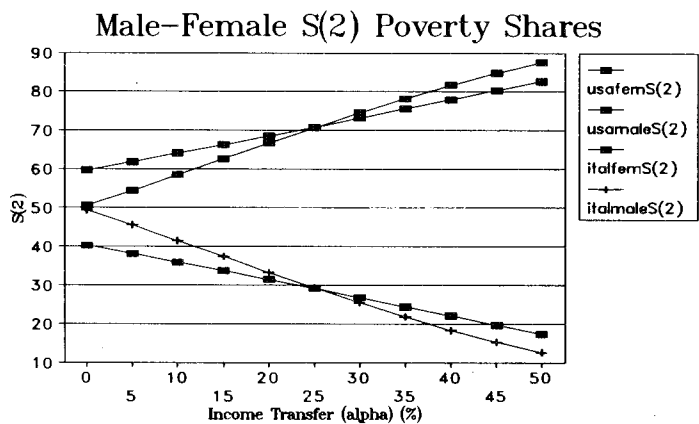
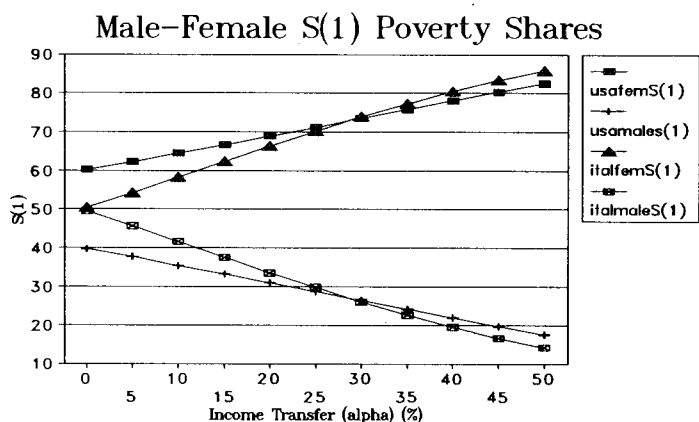
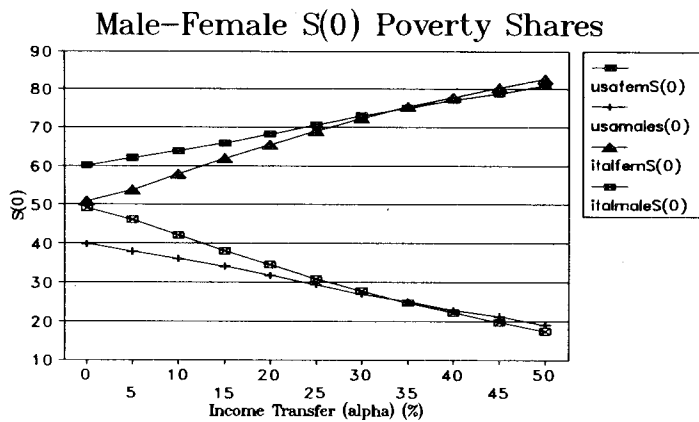


Figure 3. Male-Female Poverty Shares U.S.A. and Italy 1985/6 (All Households)

the assumption that individual household members are allowed to keep their “fair-share” of resources was relaxed. More specifically, it was assumed that women “lose” and men and children “gain” because of unequal sharing. Even though this approach does not provide any new evidence on what actually happens in the household in terms of resources flows between household members, it does suggest that if there is significant intra-household inequality of this type, as some writers have suggested, then conventional methods of poverty measurement based on the equal sharing of resources will likely to lead to a *serious* under-estimate of the incidence and intensity of female poverty (and an over-estimate of the incidence and intensity of male poverty).

It is worth reminding the reader of the main weakness with the approach we have followed. It is assumed that all women are behaving in the same way in the sense that the same proportion of their income is being transferred to other household members. The problem with this approach, of course, is that in reality this “sharing behaviour” is likely to be more heterogeneous. However, as was already mentioned, reliable data describing the structure of intra-household inequality are rare. Furthermore, we are not optimistic that data of this type will soon be available, given that it is very difficult (and expensive) to collect.

As an alternative, we are attempting to model sharing patterns by applying game theoretical models of household behaviour in the spirit of McElroy (1990). More specifically, we are attempting to apply a model of bargaining using a number of *threat points* relating to male and female opportunities both inside and outside the marriage. The data requirements of this approach are more modest and we believe it to be a tractable way of furthering the understanding of this important issue. Nevertheless it is hoped that this paper, at the very least, has illustrated the potential importance of paying attention to the intra-household distribution of resources when measuring poverty.

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