Aggregating Poor and Near-Poor Elderly Under Different Resource Definitions

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Despite dramatic reductions in elders' poverty in the United States in recent decades, there is continued concern about their welfare (Burkhauser and Duncan, 1991; Holden and Smeeding, 1990). A key finding used in justifying this concern is the large numbers of so-called near-poor elderly — those whose resources put them just above the poverty line, typically within 125 or 150 percent of it (e.g., Quinn, 1988), but sometimes up to 200 percent (e.g., Holden and Smeeding, 1990). These near-poor are of concern alternately because of their being at risk of becoming poor (Holden and Smeeding, 1990) or because the official poverty measure incorrectly overlooks them in identifying the poor (Ruggles, 1990). Compared to the nonelderly, elderly persons are considerably more likely to be near-poor. For example, in 1990, while 12.2 percent of elderly and 13.7 percent of nonelderly persons were in poverty, 14.1 percent of elderly vs only 8.5 percent of nonelderly were in households with income between 100 and 150 percent of the poverty threshold (Radner, 1993).

Consideration of the near-poor, however, exposes a serious weakness in the official poverty measure — it takes no account of depth (“intensity”) of poverty among those identified as poor. To see how this applies to the elderly population, suppose that the official poverty threshold in 1990 was actually 50 percent lower than it should be (this is among the highest of several threshold reestimates reviewed and developed in Citro and Michael, 1995). Since the elderly poverty rate would then more than double (from 12.2 to 26.3%), should we conclude that the problem of poverty is more than twice as great as we had previously believed it to be? Intuitively, our answer is likely to be “no,” because those 14.1 percent of the elderly whom we had previously failed to count as poor are certainly less poor than the 12.3 percent we had previously counted as poor. The “head count” aggregation method of the official poverty measure fails to provide us with the possibility to differentially weight poor and near-poor elderly persons.

A second problem with the official measure is that it includes as resources only current-period cash income. In response to this deficiency, non-cash public transfers and, especially important for elderly persons, assets, have been included in resources in various ways (Citro and Michael, 1995; Moon, 1977; Rendall and Speare, 1993; Ruggles, 1990; U.S. Bureau of the Census, 1992). While there remains debate about how to value non-income resources, ignoring them clearly results in downwardly biased measures of annual resources potentially available for consumption. Previous studies that have incorporated assets and non-cash transfers have not considered the near-poor issue. There are good reasons to believe that the mix of poor and near-poor elderly persons would change substantially under the additional inclusion of assets and under the additional inclusion of non-cash transfers. Wealth is, in general, distributed much less equally than is income (Wolff, 1994). Those at the lowest non-asset income levels will therefore, in general, have the least wealth. Incorporating the current-period total value of assets might then be expected to stretch out the economic-status distribution, reducing the ranks of the near-poor elderly population, but leaving the number of poor elderly persons little changed. The incorporation of non-cash public transfers might, on the other hand, have the effect of bolstering the ranks of the near-poor, since if these programs are successful in their targeting, they would shift poor elderly persons out of poverty but perhaps only as far as into near-poverty. This would then counteract the reduction of the near-poor anticipated under fully accounting for assets in the current-period resource allocation. The joint result of incorporating these two additional resource types is not clear a priori, and is the major focus of the present study.

To account for non-income resources, the present study includes non-cash public transfers — food stamps, energy subsidies, and private and public housing rent subsidies — at their face value, and values assets of the elderly person or couple as an annuity adjusted for transaction costs. To solve
Identification of the Poor and Near-Poor

Poverty identification here, as in other studies, is a household-based procedure. An elderly person is identified as poor based on a matching of household resources available for current-year consumption (here, the year 1984) to the household's needs in the same year. When needs exceed available resources, he or she is identified as poor. The magnitude by which needs exceed resources may be referred to as his or her resource deficit. Four different measures of resources are used here: the usual income-only measure; income plus non-cash transfers; income plus current-period asset allocation ("income-net-worth"); and income plus non-cash transfers and current-period asset-allocation.

All income, asset, and household composition variables are obtained for the households of members of the 1984 panel of the Survey of Income and Program Participation (SIPP; U.S. Bureau of the Census, 1984) who were over 65 for the year up to Wave 4. The sample consists of the 5,199 such persons who were still in the panel in Wave 4 and had nonzero weights. Low-income groups are oversampled in the SIPP, an advantage for the present study. The SIPP weights are adjusted here for differential attrition between Waves 1 and 4 by race, sex, and initial marital status. The recent National Research Council report (Citro and Michael, 1995) recommends use of the SIPP for poverty measurement, noting that income is more completely reported in the SIPP than in the Current Population Survey. Since the latter is used in the official poverty measure, the estimates of income-only poverty and near-poverty presented here will be somewhat lower than those found in official poverty statistics.

The annual income and poverty thresholds for the year are aggregated over the households within which the elderly person was a member in each of the first three SIPP waves (each of four months' duration), to approximate the calendar year 1984. The SIPP's Longitudinal File is used for income variables, due to its imputing missing income values longitudinally rather than cross-sectionally. Changes in household structure during the year are incorporated by aggregating over the households the elderly belonged to over the year (see Burkhauser, Holden, and Myers, 1986, for discussion of the problem of within-year changes in the composition of elderly households in estimating economic status). The allocation of current-year income completely to current-year consumption is consistent with the assumption of constant real income as a ratio to poverty threshold over remaining lifetime (see Rendall and Speare, 1993). To test for the effect of year-to-year fluctuations in income, results were also calculated using income and poverty thresholds averaged over two years, for the reduced sample of 3,981 persons interviewed over the six waves of 1984 and 1985. All results reported here were closely replicated by this average-of-two-years measure (results available on request).

Non-cash transfers as discussed here consist of the cash value of rent subsidies or implicit subsidies on public housing rents, and the cash value of food stamps and energy subsidies. Valuing non-cash medical benefits (Medicare and Medicaid) is a much more complex problem whose solution would involve difficult-to-estimate compensatory upward adjustments to the poverty threshold for greater health needs (or alternatively, subtractions from resources for out-of-pocket expenditures as proposed by Citro and Michael, 1995; see also American Association of Retired Persons, 1995). It is not attempted here.

The cash value of food stamps and energy subsidies is obtained, as for cash income, by aggregating over the households of which the elderly person was a member through the year. The annual value of private and public housing subsidies is estimated from Wave 1 and Wave 4 data. Wave 4 data are used to identify whether the household is currently receiving housing subsidies. Wave 1 data, which are more comprehensive, are used to value the subsidy. For persons in subsidized private housing, the value of the subsidy is simply reported market rent minus reported actual rent paid. The market value of public housing is not directly available from the SIPP data, and so the implicit subsidy on public housing must be indirectly estimated. To do this, the market value of public housing is first estimated by the average rent paid by those elderly in the SIPP who received private rent subsidies. The difference between this imputed market value and the public housing rent actually paid then estimates the cash value of the implicit subsidies on public housing rents. The estimation method here requires less data than the estimation method of the U.S. Bureau of the Census (1988), who compute market rent as a function of household income, number of bedrooms, and region of residence. The mean estimate of the subsidy on public housing and on private subsidized housing here is at the high end of the Census Bureau's estimates, but in the same general range.

To fully incorporate the value of assets for current-period consumption, an asset-annuitization measure shown by Rendall and Speare (1993) to produce an optimal "finite-horizon" allocation in which the elderly effectively spend down completely from their assets over their remaining expected lifetimes, is substituted for the total cash income from assets in the current year. Asset-annuitization ("income-net-worth") models originate with Weisbrod and Hansen (1968), and were first applied specifically to the elderly by Moon (1977). Subsequent applications include those of Crystal and Shea (1990) and Wolff (1990). The model used here differs from these earlier works in two respects. First, while the assets of the elderly are annuitized, the average real return is calculated for assets belonging to other household members. Second, estimates from data of the transaction cost of annuities are used here (from Friedman and Warshawsky, 1990) in place of the arbitrary 70 percent of home equity annuitized in Moon (1977) and Crystal and Shea (1990), or the implicitly zero transaction cost of Wolff (1990) and, with respect to financial assets, of Moon (1977) and Crystal and Shea (1990).
Defining $A_{\text{p}}$ as the assets of the elderly person or couple, and $r$ as the real rate of return on an annuity, with $r_s \leq r$, the real interest rate, due to annuity transaction costs, the elderly person or couple's $(T - 65)$-period optimizing asset annuity for life expectancy $N$ is given by

$$a^n_{r^*} = \frac{r_s}{1 - (1 + r_s)^{-N}}A_{\text{p}}.$$  

For an unmarried elderly person is the person's life expectancy, $N = T$, while for a married elderly person, $N$ is a joint life expectancy that adjusts for the reduction in efficiency of the household consumption upon the first death in the couple, at $T_i$, until the survivor dies at $T_f$:

$$N = T_1 + (T - T_1)b.$$  

The annuity will be equal over the periods until the first death in the elderly couple (and equal throughout the remaining life of an unmarried elderly person), and be reduced by the ratio $b$ (the ratio that maintains "household equivalence" before and after widowhood), for the surviving person's remaining lifetime after spouse death. A constant ratio of resources-to-poverty is thereby maintained before and after widowhood.

Note that housing and financial assets are treated equivalently here. A more complex treatment would be to separately calculate for housing assets, the annuity value that could be realized through a reverse-equity mortgage (e.g., Kutt, 1995) and the net rental value obtained from occupancy of the house until death. Since the same basic parameters of house value and life expectancy go into this and the simpler treatment used in the present study, it is unlikely that substantially different results would be obtained.

Assets (net worth) are for the year-end household, these data having been collected in the SIPP Wave 4 Topical Module. Assets in this study include all property and financial assets except consumer durables, and are net of debts. The face value of life insurance is discounted back to its present value over the period equal to remaining life expectancy that adjusts for the reduction in efficiency of the household consumption upon the first death in the couple, at $T_i$, until the survivor dies at $T_f$. Asset data are available both for the elderly person or couple and for the household. Other members' assets are calculated by subtracting elderly person-couple assets from household assets.

Times of death, $T_i$ and $T_f$, and the constants for rate of return on assets, $r$ and $r_s$, are estimated from non-SIPP data. $T_i$ and $T_f$ are estimated from U.S. Bureau of the Census (1989) life expectancy forecasts for the year 2005 for males and females by single year ages. Age in the SIPP is top-coded at 85. For persons aged 85 and over, life expectancy at age 85 is used. While this will downwardly bias the current-year allocation, the top-coding of age works toward addressing the concern expressed, for example, by Radner (1993), that annuitization increases current-year resources at too high a rate with increasing age.

Real interest rate $r$, used to calculate the real return on nonelderly's assets $r_{\text{n}}$, is set at 2 percent, and real rate of return on annuities $r_s$ at -.4 percent, reflecting the average 2.4 percent annuity transaction costs estimated by Friedman and Warshawsky (1990). The real interest rate is the average of rates for 10-year Treasury bonds over the 1968 to 1983 period, which is the period used by Friedman and Warshawsky to estimate annuity transaction costs. In computing the asset annuities for married elderly, for computational convenience, the ratio $b$ is taken to always be the ratio of the two-person elderly household poverty threshold to the one-person elderly household poverty threshold, $b = .793$.

The poverty threshold is given here by the official threshold (see Ruggles, 1990, chapter 3). An elderly person is then defined as poor if he or she lives in a household with current-year resources below the poverty threshold, $p(n, z)$, which rises with number of persons in the household $n$, and is affected by household composition $z$, where elderly-headed households and households with children have lower thresholds. To identify near-poor elderly, $p(n, z)$ is multiplied by the constant $k$, where $k$ is 1.25, 1.5, and 1.75, and 2 in our experiments with different definitions of near-poor. "Relative" poverty is also estimated, identifying as "poor" those elderly persons with resources below one-third, and "near-poor" between one-third and one-half of the elderly resource median. This is consistent with treatment by, for example, Burkhauser, Duncan, and Hauser (1994).

**RESULTS**

The results are organized as follows. First, the shape and location of the lower part of the resource distribution under the alternative resource measures are described, with poverty and near-poverty alternately described in relative and absolute terms. Second, the effects of poverty-threshold increase and additional resource inclusion on poverty prevalence and intensity, and on the joint prevalence-intensity measure known as the FGT index, are estimated.

**Changes in the Resource Distribution**

Changes in the shape and location of the resource distribution that result alternately and jointly from full inclusion of net worth and inclusion of non-cash transfers are seen in changes in the percentages in poverty and near poverty under a relative definition (Panel A of Table 1), and in changes in the resource-to-poverty ratios that define decile upper limits (Panel B of Table 1), and in the proportions moving up to a higher resource-to-poverty category with additional resource inclusion (Table 2). Resource-to-poverty category is found simply by dividing the household's current-year resources by the household's poverty threshold.

The results include, first, the anticipated stretching out of the distribution under full inclusion of net worth and its being pushed back together under inclusion of non-cash transfers, and second, a substantial rightward shift of the distribution under joint inclusion of assets and non-cash transfers. Under income-only resources, 4.1 percent are in relative poverty (defined by household resources of less than one-third of the median household resources among elderly persons), and 16.5 percent are either in relative poverty or near-poverty (resources of less than one-half of the median). Including the annuity value of assets (the income-net-worth measure) stretches the distribution of elderly persons by resource level to the right. The effect is to increase relative poverty to 7.0 percent and relative poverty or near-poverty to 18.2 percent. The source of the "stretching-out" of the distribution with full asset inclusion is seen in the higher the
Table 1. Distribution of Resources and Measures of Relative Poverty

<table>
<thead>
<tr>
<th></th>
<th>Income Only</th>
<th>Income and Non-cash Transfers</th>
<th>Income Net Worth</th>
<th>Income Net Worth and Non-cash Transfers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Relative Poverty (% With Resources)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1/3 of median</td>
<td>4.1</td>
<td>2.6</td>
<td>7.0</td>
<td>4.6</td>
</tr>
<tr>
<td>From 1/3 to 1/2 of median</td>
<td>12.4</td>
<td>10.8</td>
<td>11.2</td>
<td>11.2</td>
</tr>
<tr>
<td>From 1/2 to 2/3 of median</td>
<td>11.7</td>
<td>12.2</td>
<td>10.2</td>
<td>11.7</td>
</tr>
<tr>
<td>From 2/3 of median up to the median</td>
<td>21.8</td>
<td>24.3</td>
<td>21.7</td>
<td>22.5</td>
</tr>
<tr>
<td>Total</td>
<td>50.0</td>
<td>50.0</td>
<td>50.0</td>
<td>50.0</td>
</tr>
</tbody>
</table>

| **B. Resource Deciles** |             |                               |                  |                                        |
|------------------------|-------------|-------------------------------|------------------|                                        |
| 10                     | 0.97        | 1.06                          | 1.16             | 1.33                                   |
| 20                     | 1.27        | 1.40                          | 1.65             | 1.73                                   |
| 30                     | 1.64        | 1.70                          | 2.15             | 2.18                                   |
| 40                     | 2.00        | 2.02                          | 2.62             | 2.63                                   |
| 50 (median)            | 2.36        | 2.37                          | 3.10             | 3.11                                   |

"Resource deciles" give the resource level, expressed in units of official poverty-threshold, below which 10, 20, 30, 40, and 50 percent of the elderly had available in 1984.

Source: Author's tabulations from the SIPP.

Table 2. Movement Up From Income-Only Resource: Poverty Ratio Category With Change in Resource Definition

<table>
<thead>
<tr>
<th>Income-Only Resources as a % of Official Threshold</th>
<th>Income plus Non-cash Transfers</th>
<th>Income Net Worth</th>
<th>Income Net Worth plus Non-cash Transfers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Moving Up</td>
<td>% Moving Up &gt; 1</td>
<td>% Moving Up</td>
</tr>
<tr>
<td>&lt;75</td>
<td>25.2</td>
<td>8.8</td>
<td>34.0</td>
</tr>
<tr>
<td>75 to 100</td>
<td>11.0</td>
<td>17.4</td>
<td>28.4</td>
</tr>
<tr>
<td>100 to 125</td>
<td>9.1</td>
<td>16.0</td>
<td>25.1</td>
</tr>
<tr>
<td>125 to 150</td>
<td>8.0</td>
<td>9.0</td>
<td>17.0</td>
</tr>
<tr>
<td>150 to 175</td>
<td>3.8</td>
<td>1.9</td>
<td>5.7</td>
</tr>
<tr>
<td>175 to 200</td>
<td>—</td>
<td>—</td>
<td>4.0</td>
</tr>
<tr>
<td>&lt;100</td>
<td>—</td>
<td>—</td>
<td>23.0</td>
</tr>
</tbody>
</table>

Source: Author's tabulations from the SIPP.

The likelihood of moving up a poverty category with asset inclusion, the better-off initially is the elderly person (i.e., under the income-only measure). While just under 50 percent of the income-only poor move up at least one category (and approximately 30% move up two or more categories), approximately two-thirds of elderly with income-only resources between 125 percent and 175 percent of the official threshold move up at least one category by full inclusion of net worth. Asset inclusion thus, as anticipated, increases inequality in the elderly population. Nevertheless, as many as 43 percent of income-only poor elderly persons become non-poor with the additional inclusion of the annuity value of assets.

Adding non-cash transfers to income produces a counter-vailing compacting of the lower tail of the resource distribution into the near-poor region, while leaving unchanged the distribution's center. As few as 2.6 percent of the elderly are thereby left in relative poverty and 13.4 percent in relative poverty or near-poverty. In contrast to the asset-inclusion effect pattern, the poorer elderly are the most likely to move up a resource-to-poverty category with inclusion of non-cash transfers (see the third results column from the left in Table 2).

Among all "poor" elderly (those with income-only resources less than the official poverty threshold), 23 percent move out of poverty with the additional inclusion of non-cash transfers in resources. Above 150 percent of income-only poverty, however, non-cash transfers' effects are negligible. Note also from Panel B of Table 1 that including non-cash transfers leaves median resources-to-poverty virtually unchanged from that under income-only measurement. Non-cash transfers have most of their effect on the 10th and 20th percentiles, which are respectively 9 and 10 percent higher under the income-plus-transfers measure than under the income-only measure. Non-cash transfers are thus significantly successful in moderating the effects of the private resource distribution on poverty in the elderly population.

Simultaneously including both non-cash transfers and the annuity value of net worth sees their opposite effects on the distribution's shape canceled out. There are slightly more elderly in relative poverty (4.6% vs 4.1% under income-only), and slightly fewer in relative near-poverty — 11.2
percent, as against the 12.4 percent under income-only. However, the combined effect of including assets and non-cash transfers shifts the location of the distribution substantially to the right. This is indicated firstly by increases in resource-to-poverty deciles (of between 32 and 37%), and secondly by the approximately equal percentages of persons in each income-only category who move up at least one resource-to-poverty category (between 69 and 82% of the persons in each category, as seen in the last column of Table 2). Almost two-thirds of the income-only poor are moved above the poverty threshold with this fuller inclusion of resources.

Aggregate Poverty Index Changes

The FGT index (Foster, Greer, and Thorbecke, 1984) is chosen here to aggregate poverty in the elderly population. The reader is referred to Rodgers and Rodgers (1991) for a fuller exposition of this index, and for discussion of the relative merits of alternative indexes. Importantly, the FGT index: (1) may be factored into a poverty-prevalence component that is nothing but the standard poverty measure (the "head-count ratio"), and a deficit-ratio component that quantifies poverty intensity; and (2) satisfies a comprehensive set of poverty-measure "axioms" (as first introduced by Sen, 1976, and summarized in Rodgers and Rodgers, 1991).

Parameterizing the FGT index by the poverty-threshold multiplier $k$, and denoting by $y$, the measure of current-period resources of individual $i$'s household, the index is expressed formally as:

$$ FGT(k) = P \cdot \lambda $$

where $P = m/n$, equal to the number of poor $m$ divided by the total (elderly) population $n$ (i.e., the "head-count ratio" aggregation method of the official poverty measure). The intensity component

$$ \lambda = \frac{1}{m/\lambda} \sum_{i=1}^{\infty} \left( \frac{kp(n, z_i)}{\eta} \right)^{\frac{1}{k}} $$

The prevalence component is given by $P = m/n$, equal to the number of poor $m$ divided by the total (elderly) population $n$ (i.e., the "head-count ratio" aggregation method of the official poverty measure).

The main summary result of Table 3 is that the percentage declines in the FGT index are slightly less at above official poverty threshold levels (175, 150, and 125% of the official thresholds) than at the official poverty threshold. Therefore, the near-poor contribute slightly more to aggregate poverty than is implied by income-only resource measurement. While the FGT index declines by 64.8 percent at the official threshold (from .0484 to .0211), it declines 56.4 percent at 150 percent, and by 63.4 percent at 125 percent of the official threshold (see the rightmost column of Table 3). To better understand these declines in the FGT index with additional resource inclusion, the FGT's two components, poverty prevalence and poverty intensity, are next considered. First, by considering prevalence and intensity changes separately, it is seen that the above, FGT-index-change result constitutes a much stricter test of the near-poor's contribution to aggregate poverty than does the more common test of prevalence-only change (i.e., change in the proportion poor). While at the official poverty threshold, the additional joint inclusion of non-cash transfers and the annuitized value of assets decreases prevalence by 62.7 percent, their joint inclusion decreases prevalence by only 37.9 percent. The reader is referred to Rodgers and Rodgers (1991) for a comprehensive set of poverty-measure "axioms" (as first introduced by Sen, 1976, and summarized in Rodgers and Rodgers, 1991).
percent at 175 percent of the official threshold. Thus, the finding that the near-poor elderly population contribute proportionately more to aggregate poverty under additional resource inclusion than they do under an income-only resource definition is much stronger (though misleadingly so) when poverty prevalence only is considered (the official aggregation method) than when prevalence and intensity are jointly considered (by using the FGT index).

In fact, we should expect prevalence effects to be countered by rather than reinforced by intensity effects. Poverty intensity declines with additional resource inclusion should be greater at higher threshold levels than at the official threshold, since a higher ratio of near-poor to poor elderly persons under additional resource inclusion implies a lesser average poverty depth (resource deficit) among them. This is seen here by looking at the FGT index's poverty-intensity component only: while poverty intensity declines only 4.9 percent at the official poverty threshold with fuller resource inclusion (from .0813 to .0773), it declines 29.6 percent at 175 percent of this level (from .1459 to .1027). Thus, considering poverty intensity alone, the near-poor contribute less to aggregate poverty relative to the contributions of the poor when additional resources are included. The main, FGT-index reduction result may thus be restated as follows: even when the near-poor (those between the official threshold and a raised threshold) are given smaller weights in an aggregate poverty index than are the poor, their higher relative prevalence under fuller resource inclusion more than compensates for their lower poverty intensity, and so the near-poor are found to contribute more to aggregate poverty in the elderly population under fuller resource inclusion than under an income-only definition of resources.

Poverty-index change with separate additional inclusion of assets or non-cash transfers. — In the section on changes in the resource distribution, it was seen that non-cash transfers and assets have very different distributional consequences — non-cash transfers compacting the lower tail, and assets stretching it out. Given these differences, and given the active debate in the poverty measurement literature on how and whether to include assets and non-cash transfers in resources, it is useful to investigate the contributions of assets and non-cash transfers separately.

Importantly, the main summary result — that poverty declines with additional resource inclusion more at raised thresholds than at the official threshold — holds when either non-cash transfers or the annuity value of assets are additionally included. From the FGT columns of the two middle panels of Table 3, it is seen that the FGT index again declines less at 175 percent and 150 percent of the official poverty threshold than it does at the official threshold level. A minor exception occurs at the 125 percent level, where a slightly greater decline in the FGT index is seen when non-cash transfers only are added.

The relative contributions to FGT-index reduction of poverty-prevalence reduction and poverty-intensity reduction are, however, very different with the addition of non-cash transfers than with the addition of the annuity value of assets. To see this, the FGT-index reduction with additional resource inclusion is formally decomposed into a

### Table 3. Indices of Poverty Prevalence, Intensity, and Combined Prevalence and Intensity (the FGT Index)

<table>
<thead>
<tr>
<th>Percent of Official Poverty Threshold</th>
<th>Percent Reduction</th>
<th>Percent of Total FGT Reduction</th>
<th>Percent Reduction</th>
<th>Percent of Total FGT Reduction</th>
<th>Percent Reduction</th>
<th>Percent of Total FGT Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>175%</td>
<td>.3114</td>
<td>.1459</td>
<td>.0484</td>
<td>.3156</td>
<td>.1228</td>
<td>.0388</td>
</tr>
<tr>
<td>150%</td>
<td>.2589</td>
<td>.1237</td>
<td>.0320</td>
<td>.2291</td>
<td>.1079</td>
<td>.0247</td>
</tr>
<tr>
<td>125%</td>
<td>.1897</td>
<td>.0966</td>
<td>.0183</td>
<td>.1544</td>
<td>.0893</td>
<td>.0138</td>
</tr>
<tr>
<td>100%</td>
<td>.1079</td>
<td>.0813</td>
<td>.0088</td>
<td>.0832</td>
<td>.0806</td>
<td>.0067</td>
</tr>
</tbody>
</table>

*Prevalence = proportion poor.

*Intensity = average squared resource-deficit ratio (see text for details).

*FGT = Prevalence × Intensity.

*From the corresponding index value under income-only resources.

*From the FGT-index value under income-only resources.

Source: Author's tabulations from the SIPP.
prevalence-reduction effect and an intensity-reduction effect. Das Gupta's (1993) method of decomposition is used here. It has the major advantage over other decomposition methods of eliminating "interaction effects," resulting here in the prevalence effect and the intensity effect adding to the total FGT-reduction effect. Letting \( P \) and \( I \) represent respectively the prevalence and intensity components of the FGT index under the income-only resource definition, and \( P' \) and \( I' \) represent prevalence and intensity under additional resource inclusion, then:

\[
\text{Prevalence-reduction effect} = \frac{(P' \cdot I - P \cdot I) + (P' \cdot I' - P \cdot I'))}{2};
\]

\[
\text{Intensity-reduction effect} = \frac{(P' \cdot I - P \cdot I) + (P' \cdot I' - P \cdot I'))}{2}.
\]

When the annuity value of assets is additionally included, the prevalence-reduction effect is seen to greatly dominate the intensity-reduction effect, by approximately 4 to 1 at all threshold levels (refer to the Prevalence and Intensity columns of the Income Net Worth panel in Table 3). The effects of additionally including non-cash transfers, on the other hand, depend strongly on which poverty threshold is considered (i.e., who are included in the "near-poor"). When additionally including only non-cash transfers, FGT index reduction is only 3 percent due to intensity reduction at the official poverty threshold, but is 28 percent due to intensity reduction at 125 percent of the official threshold, 53 percent due to intensity reduction at 150 percent of the official threshold, and 78 percent due to intensity reduction at 175 percent of the official threshold (see the Income and Non-cash Transfers panel of Table 3). Note that the importance of poverty-intensity declines when non-cash transfers are included at higher thresholds means that the effect of public transfers on poverty reduction would be greatly understated if only prevalence were considered at higher poverty thresholds. The effect of asset inclusion, meanwhile, is felt mainly through prevalence reduction, and so its effects are largely captured by the poverty-prevalence component alone.

**DISCUSSION**

This study's analyses have important implications both for policies and programs aimed at elderly poverty prevention, and for solving the problem of how to measure poverty in the elderly population. The main aim of this study was to expose to more rigorous testing the oft-cited result of large numbers of near-poor elderly persons relative to poor elderly persons using a poverty measure that (a) takes into account resources in addition to cash income, and (b) weights degrees of poverty and near-poverty consistently with a well-developed set of poverty axioms. It is concluded here that the elderly "near-poor problem" is indeed more than an artifact of flawed poverty-measurement methods. The contribution of the "near-poor" to economic deprivation in the elderly population remains as high relative to the contribution of the "poor" as it is under income-only measurement. In fact, it is slightly higher.

Regarding evaluation of public programs for elderly poverty prevention and alleviation, the sizable reduction of poverty occurring through poverty-intensity declines indicates considerable success in the targeting of non-cash transfer programs in the elderly population. The bottom tail of the elderly population's resource distribution is found here to be substantially diminished by non-cash transfers from food, heat, and housing subsidy programs. Under raised poverty thresholds, the poor and near-poor elderly persons' resource deficits are thus reduced (a beneficial poverty-intensity effect), even when they are in many cases not eliminated (i.e., do not result in poverty-prevalence reduction).

The elderly's own asset accumulations, on the other hand, do much to reduce the prevalence of poverty, but do less to reduce the intensity of poverty. The reduction in poverty prevalence, however, is almost as great from below the income-only official poverty line as it is from near-poor income levels, indicating widespread asset holdings at even the lowest income levels. Note that the finding of greater poverty prevalence reductions through asset inclusion than through non-cash transfer inclusion should be treated with caution, since poverty reduction through the public provision of non-cash medical benefits (through the Medicaid and Medicare programs) is not estimated here. Moreover, asset valuation remains a controversial problem in poverty measurement, due in part to the problem of how to treat precautionary savings for later-life increases in needs for medical treatment and functional assistance. Appropriately accounting for these increased needs remains a crucial but controversial issue in elderly poverty measurement.

The implications of the results of the present study for the problem of measurement of elderly poverty are usefully placed in the context of the broader National Research Council (NRC) study of poverty measurement reported by Citro and Michael (1995). They recommend a raising of the poverty threshold and inclusion in resources of non-cash transfers, but not assets (though they recommend further work to investigate methods for their inclusion). They also recommend a continued use of the head-count aggregation method (though supplemented by other measures). The findings of the present study indicate two major problems with the NRC group's recommendations when applied to the elderly population, suggesting that their recommendations do not go far enough to correct the major flaws of the current official poverty measure. First, if the poverty threshold is raised, but the prevalence-only "head-count ratio" is retained as the principal poverty aggregation method, much of the poverty reduction through the recommended additional inclusion of non-cash public transfers — that occurring through reduction in poverty intensity — will be missed. The prevalence-only measure is insensitive to increases in heterogeneity of economic conditions among the poor that occur as the poverty threshold is raised. Using raised thresholds in comparisons between the elderly population and the nonelderly population would therefore also be misleading without also accounting for the probable lower average poverty intensity in the elderly population. The present study's poverty-intensity reduction results reinforce, however, the NRC's recommendation that non-cash transfers be included in resources. Second, the NRC group's decision to set aside the problem of asset valuation in resources until further work is done is problematic in light of the finding here of large reductions of poverty prevalence through asset
inclusion at all threshold levels. We note here also that previous work (Rendall and Speare, 1993) has found major distortions in within-elderly intergroup poverty comparisons (particularly those between Black and White elderly persons) resulting from the exclusion of assets from resources in a poverty measure.

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