Comment on Gary V. Englehardt and Jonathan Gruber
"Social Security and the Evolution of Elderly Poverty"

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Englehardt and Gruber (EG) provide convincing new evidence that the rapid decline in elderly poverty in the late 1960s and early 1970s was driven by the increasing generosity of Social Security benefits. In this comment I present some additional descriptive analysis of the changing age structure of poverty in the United States. I also suggest a framework that could be used to extend EG's reduced-form approach to a more complete analysis of the causal linkages between Social Security benefits and poverty. Finally, I use this framework to discuss EG's instrumental variables strategy and suggest further extensions.

I. The Changing Age Structure of Poverty

Figure 1 provides the main motivation for EG's work. This figure shows published poverty rates (from Proctor and Dalaker, 2003) from 1959 to 2002 for three groups: elderly adults; non-elderly adults, and dependent children.[1] Although the poverty rates of the three age groups moved in parallel between 1959 and 1969, starting in 1970 the poverty rate of the elderly population plummeted relative to that of the other age groups. Indeed, between 1970 and 1974 the elderly poverty rate fell by 45 percent, while poverty rates for the other groups were nearly constant. After 1983, the poverty rate of the elderly again tracks the poverty rate of non-elderly adults very closely. These patterns point to the 1970s as a critical period for understanding the evolution of elderly poverty in the U.S.

Further insight into the poverty trends for different age groups is provided in Figure 2, which shows poverty rates for various narrow age groups for the period from 1967 to 1998,

[1]Dependent children are individuals age 18 or under who live with a related adult. The poverty rates for dependent children annual from 1959 onward. For the other two groups, the Census Bureau reports 1959 data, and data for 1967 onward. I linearly interpolated the series.

constructed from the 1968 to 1999 March Current Population Survey (CPS) files.[2] The line marked with solid squares represents the poverty rate of 57-61 year olds. People in this age group are close to the end of their working lives, but not yet eligible for Social Security benefits. Their income levels and poverty rates therefore provide a natural benchmark for judging the older age groups. Over the 1967-1998 period, the poverty rate of 57-61 year olds fluctuated in a narrow range between 8 and 11 percent, with virtually no trend. By comparison, the poverty rates of the older age groups have all fallen. For example, the poverty rate of 65-69 year olds (most of whom are receiving Social Security benefits) has halved since 1967, and is now below the rate of 57-61 year olds.[3] Consistent with Figure 1, most of the reductions in poverty rates for the older age groups occurred between 1969 and 1977. The drop for the oldest age group (age 75 or more) between 1970 and 1973 is especially remarkable. Since nearly everyone in this group had retired before 1970, the drop suggests an important role for the ex-post adjustments to the real value of Social Security benefits that were made in the early 1970s.

Another way of illustrating the changing relative poverty rates of people on either side of the age cutoff for Social Security eligibility is shown in Figure 3. This figure shows the cross-sectional age profiles of poverty in selected 4-year periods.[4] In the earliest period (1967-70), the

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[2]Unlike EG, I use the poverty indicator in the CPS file, rather than construct my own. This mainly effects elderly people who live with their children. The Census Bureau pools the income of all related family members who live in the same household to estimate poverty rates. EG perform an alternative calculation using only the income of the elderly person's "subfamily" (in most cases just his or her own income and the income of the spouse).

[3]Note that the official poverty line is slightly lower for people who are 65 or older (and for families headed by a person over 65).

[4]I pool 4 CPS files to reduce the sampling variability in the poverty rates for each age group.

age profile of poverty is sharply rising. By the latest period (1995-98) the profile is relatively flat. Closer examination of the profiles, however, reveals that the shift in slopes is confined to people age 62 and older. Consistent with a Social Security-based explanation, the profiles appear to be "hinged" at age 61. Moreover, as would be expected from the timing of the benefit increases, much of the change occurs very early on. Over two-thirds of the trend shift for groups over the age of 62 occurred by the late 1970s.

II. The Impact of Social Security Benefits on Poverty

EG's estimation model is a simple "reduced form" equation relating the incidence of poverty to Social Security benefit income. Underlying this equation is a more complete structural model that delineates the causal channels linking benefit levels to poverty. I believe that future work could easily build on EG's paper to evaluate the relative importance of these alternative channels. To illustrate, let y_{iat} represent the family income of individual i in age group a in year t, measured in real dollars. This person is classified as poor if $y_{iat} < T(S_{iat})$ where S_{iat} is the size of i's family, and T(S) is the real poverty threshold for a family of size S. Family income consists of Social Security benefits (SSB_{iat}), earnings (E_{iat}), and other income, including government transfers, private pensions, etc. (O_{iat}). Thus, individual i is classified as poor if $z_{iat}<0$, where

$$(1) \qquad z_{iat} = SSB_{iat} + E_{iat} + O_{iat} - T(S_{iat}) .$$

Earnings and other family income both potentially depend on Social Security benefits. For example, if families have Stone-Geary utility functions defined over current period consumption and leisure then

(2) $E_{iat} = E^0_{iat} - \alpha\ (SSB_{iat} + O_{iat})$,

where E^0_{iat} is the optimal level of earnings with zero transfer income, and α represents the (negative) "marginal propensity to earn out of non-wage income" (Pencavel, 1986), which is between 0 and 1 if leisure is a normal good.[5] Similarly, other transfer income may depend on Social Security income through means testing, implying that

(3) $O_{iat} = O^0_{iat} - \beta\ SSB_{iat}$,

where β measures the implicit tax rate on Social Security benefits embedded in the other transfer income programs available to low-income elderly people. Equations (2) and (3) imply that a $1 increase in Social Security income leads to an increase of $1-\alpha-\beta+\alpha\beta$ in total family income.

If family structure is unaffected by a change in Social Security benefits then the effect of a $1 increase in Social Security income on the poverty rate of people of age a in year t is

(4) $(1-\alpha-\beta+\alpha\beta)\ f_z(0|\ a, t)$

where $f_z(\cdot\ |a, t)$ represents the density of the random variable z_{iat} defined in equation(1) across the population of age a in year t. EG's research strategy is designed to obtain an estimate of the average value of this derivative over age groups, family types, and years. Equation (4) shows that even in the absence of family structure effects, the magnitude of this derivative depends on the relative number of families "near" the poverty line, and on the responsiveness of earnings and other transfer income to shifts in Social Security benefits. If family structure is affected by changes in Social Security benefits then the derivative includes an additional term reflecting the re-allocation of people to different sizes of families.

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[5]This is obviously over-simplified, and ignores such features as the earnings limit for Social Security recipients and interactions between family members.

EG's instrumental variables strategy can obviously be extended to examine the effects of changes in Social Security benefits on earnings and other transfer income. Essentially, their strategy can be used to estimate equations (2), (3), and the net effect of a change in Social Security benefits on total family income. Available evidence suggests that the labor supply responses are small, or even negligible (Krueger and Pischke, 1992), though it is possible that the effects for certain subgroups are larger. The responses of other transfer income to the rises in Social Security benefits may be larger. For example, a table reported by Smeeding and Smith (1998, Table 2) shows that in the early 1960's welfare income accounted for 16 percent of the total family income of households with heads over age 65. By 1976, with the rise in the relative size of Social Security benefits, this fraction had fallen to 4 percent.

An advantage of the framework underlying equation (4) relative to EG's simple specification is that it provides a natural way to account for heterogeneity across different groups in the measured effects of Social Security benefits on poverty. Subgroups with a larger population near the poverty line will show a bigger responsiveness of poverty to benefit increases, even if the behavioral parameters (α, β) are similar across groups. By the same token, relatively rich or relatively poor subgroups with few people near the poverty line will show a very small responsiveness of poverty rates to benefit increases, even if their behavioral parameters are the same as those of other subgroups.

III. EG's Instrumental Variables Strategy

The idea underlying EG's instrumental variables strategy is to develop an instrument that reflects differences in the generosity of benefits available to people from different birth cohorts at

different ages, but is independent of the particular work histories or retirement choices of different cohorts. To accomplish this, they use the ANYPIA calculator to estimate Social Security benefit amounts in the first year of retirement for a "representative" retiree from different birth cohorts with the same real earnings history (estimated using data for men born in 1916). The representative retiree is assumed to retire at age 65. The variation in the initial benefit amounts for a "representative" retiree from different birth cohorts is shown in Figure 4, which is based on EG's Figure 10. For reference, I have also graphed the poverty line for an elderly family of size 1. As noted by EG, the rise in initial benefit generosity is quite remarkable.

The disparities in initial benefits in Figure 4 actually overstate the impact of changing Social Security benefit formulas on different cohorts, however, because real benefit levels for continuing beneficiaries were raised substantially during the late 1960s and 1970s until the introduction of automatic indexation in 1977. Because of automatic indexation, EG's instrumental variable for people born in 1912 and later takes on the same value at all ages. For earlier cohorts their instrument varies by cohort and age: the instrumental variable is equal to the initial benefit level for the cohort (at age 65) plus accumulated real increases due to cost of living adjustments.

The two sources of "formula-based" variation in real benefits available to a given cohort at a given age potentially identify different things. The variation due to ad hoc cost of living adjustments affected people from older cohorts who were already retired. Arguably, these people had relatively little room for behavioral reactions. Thus, the changes in real benefit levels that accrued to post-retirees in the late 1960s and early 1970s (e.g., the over-75 age group in Figure 2) probably generated close to dollar-for-dollar rises in real family income. These people were also

relatively poor, so the income gains had the potential to generate relatively large reductions in poverty.

By comparison, variation in initial Social Security benefits affects people who are close to the retirement decision. In principal at least these people have more room for behavioral reactions (e.g., retiring earlier) that may partially offset the benefit increases, leading to less than dollar-for-dollar rises in family income. Morever, the big variation in initial benefit levels for cohorts born just before and just after 1916 affected groups who were already relatively well off, so the potential to affect the absolute poverty rate was limited. These considerations suggest that it may be interesting for future researchers to separate the two sources of formula-based variation in Social Security benefits noted by EG and use a local average treatment effect framework (Angrist and Imbens, 1994) to interpret the differences in the impacts on income and poverty.

References

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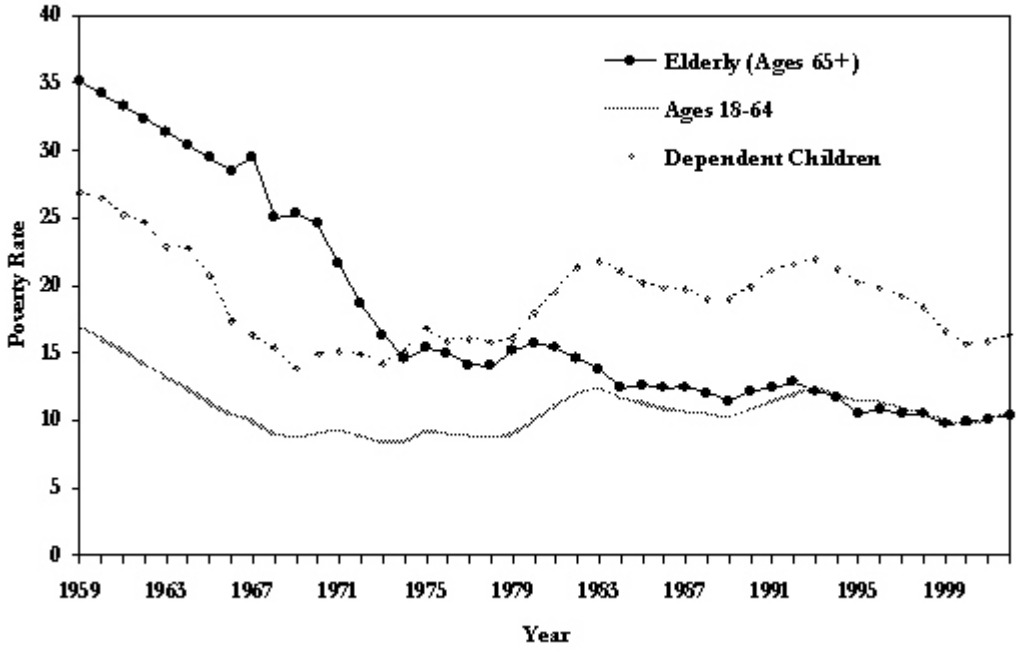
Figure 1: Poverty Rates of Elderly, Non-Elderly Adults, and Children



Note: Published poverty rates for elderly and non-elderly adults interpolated between 1959 and 1966.

Figure 2: Poverty Rates by Age Group

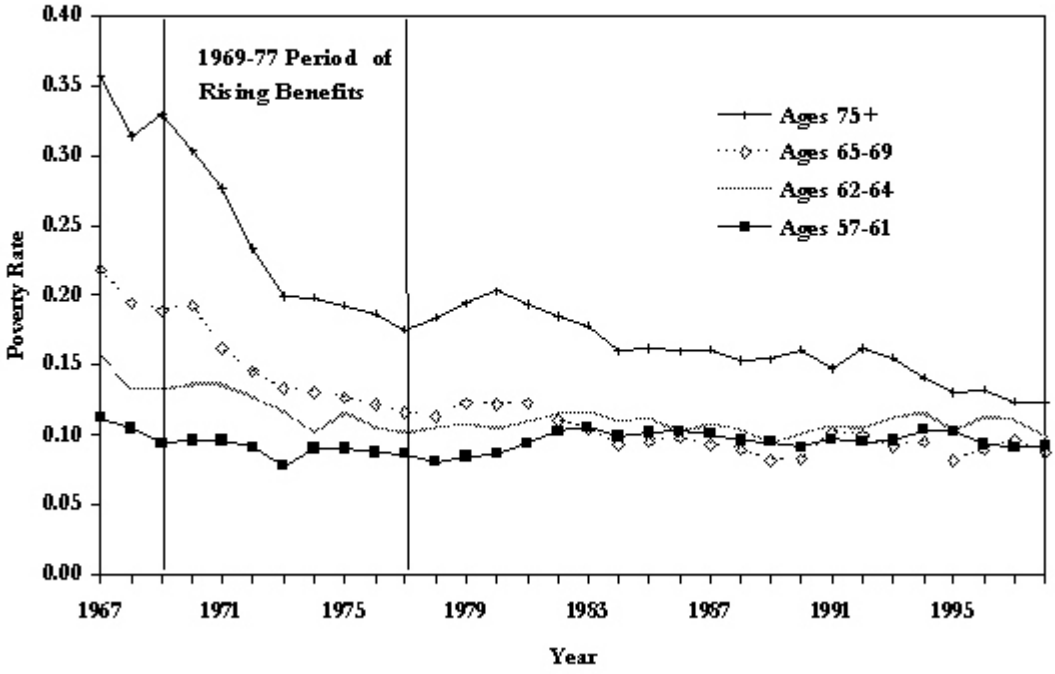


Figure 3: Changing Age Profile of Poverty

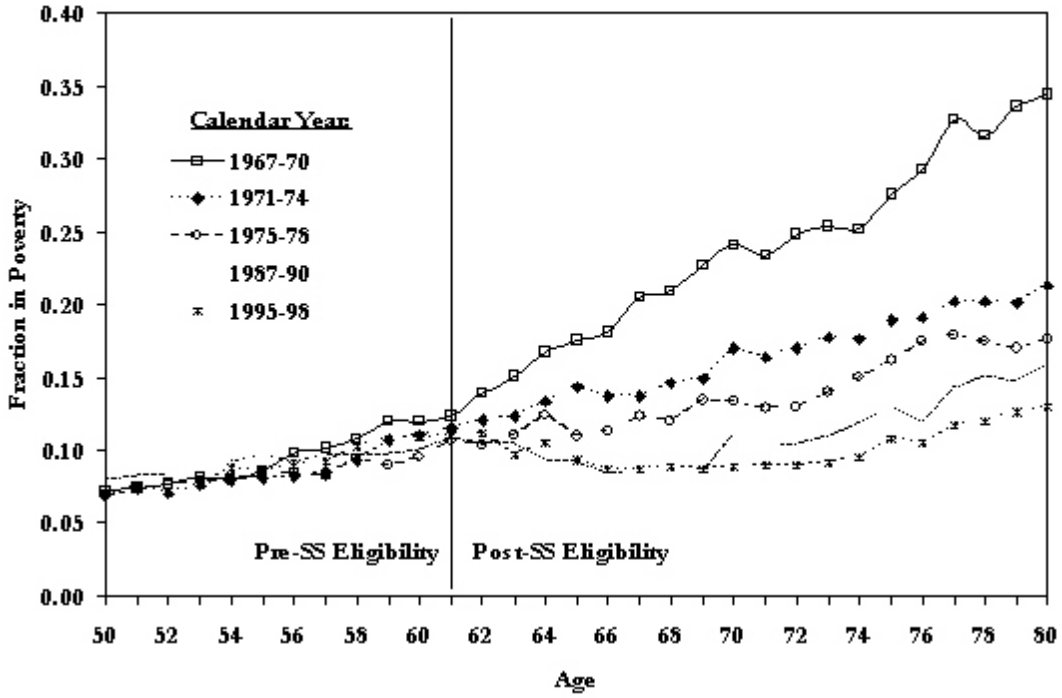


Figure 4: Simulated Initial Annual Benefit for Age 65 Retiree