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residual task difficulty on use of personal assistance, days in bed, and nursing home placement. *Journal of the American Geriatric Society* 52:72–79.
Verbrugge, Lois M., Catherine Rennert, and Jennifer H. Madans. 1997. The great efficacy of personal and equipment assistance in reducing disability. *American Journal of Public Health* 87 (3): 384–92.
Verbrugge, Lois M., and Purvi Sevak. 2002. Use, type and efficacy of assistance for disability. *Journal of Gerontology: Social Sciences.* 57B (6): S366–S379.
Weiss, Carlos O., Hector M. Gonzalez, Mohammed U. Kabeto, and Kenneth M. Langa. 2005. Differences in amount of informal care received by non-Hispanic whites and Latinos in a nationally representative sample of older Americans. *Journal of the American Geriatrics Society* 53:146–151.
Zimmer, Zachary, and James S. House. 2003. Education, income, and functional limitation transitions among American adults: Contrasting onset and progression. *International Journal of Epidemiology* 32:1089–97.

Comment Michael D. Hurd

Introduction

A strong positive correlation between health and socioeconomic status (SES) is well established in the literature. Health can be measured by survival, self-rated health, disease conditions, ADL limitations, or other measures, and SES can be measured by income, wealth, education, and occupation, among others. Yet, a main finding of Cutler, Landrum, and Stewart is that education has a strong relationship with impairment and with coping with impairment, whereas income does not. For example, in figure 6.2, with the exception of the lowest income band, which has about 18 percent of the sample, there is little variation in the prevalence of an ADL limitation across income categories. Higher education helps to cope with ADL limitations, mainly through the use of equipment, but income does not (table 6.6). While these results may be correct, the data set on which they are based, the 1994 and 1995 National Health Interview Surveys (NHIS), has a deficient income measure, which will obscure the true relationship between income and other variables, including impairment. Furthermore, in estimations in which both income and education explain an impairment or coping with an impairment, the deficiencies in the measurement of income will affect estimated effects of education because of the positive correlation between income and education.

My discussion will focus on measurement error in income and how it will contaminate the estimated effects of education. Before that discussion, however, I note the low levels of ADL limitations reported in the NHIS: according to table 6.2, the rate was just 9.5 percent among those age sixty-five or over. The authors state that this rate is similar to the rate as measured in

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other data sets. They cite a rate of 15 percent in 1995 AHEAD, which would be over the age range of seventy-two or over. My calculation in 1998 HRS over the age range sixty-five or over is 22.5 percent (weighted). The authors also cite rates of 15 percent in the NLTCS and about 20 percent in the MCBS. These rates of 15 percent to 22 percent are substantially higher than the NHIS rate, and the difference warrants investigation.

Measurement of Income in the NHIS

Income in the NHIS is assessed in the following manner: a respondent for the household is asked whether anyone in the household has income from earnings, and if so, which of the household members has earnings. This question format is repeated in turn for each of self-employment income, Social Security, pensions, SSI, Social Security DI, welfare, interest from savings, dividends, child support, and any other sources. At this point, the respondent has not been asked about amounts—just whether anyone has income from those sources. Then, in a single question, the respondent is asked about total household income received by all household members during the past year. This is a very difficult question to answer, and generally will lead to underestimates of income and to under-reporting of income in the tails of the distribution.

If the respondent does not give a quantitative answer, he or she is asked a single bracketing question: $20,000, or more or less than $20,000? Depending on the bracket, the respondent is asked to choose the income interval from a range card. The range card for the lower bracket has twenty intervals, each $1,000 wide, from zero to $20,000. The range card for the upper bracket has intervals of width $1,000 up to $35,000 and intervals of width $5,000 up to $75,000. It is well known from cognitive research that subjects tend to give responses in the middle of a range card, so I would expect a clustering of responses between about $8,000 and $14,000, which is in the middle of the first range card, and a clustering of responses between about $29,000 and $35,000, which is in the middle of the second range card.

We can compare the distribution of income in the NHIS with the distribution of income in the HRS among those sixty-five or over.[1] The HRS has a widely copied assessment of income that has been replicated over many waves and has been validated against the CPS. Figure 6C.1 shows that the HRS distribution has more mass in the tails and considerably less in the range of $10,000–$30,000. This would be expected from measurement error and the tendency of the NHIS range cards to pull respondents toward the middle of the distribution.

A second possible explanation for the difference in income is that HRS and NHIS have surveyed different populations, even though they target the same population. Figure 6C.2 shows the distribution of education in

1. I use HRS 1998 for this comparison because prior to 1998, HRS (including AHEAD) did not cover the entire age range sixty-five or over.

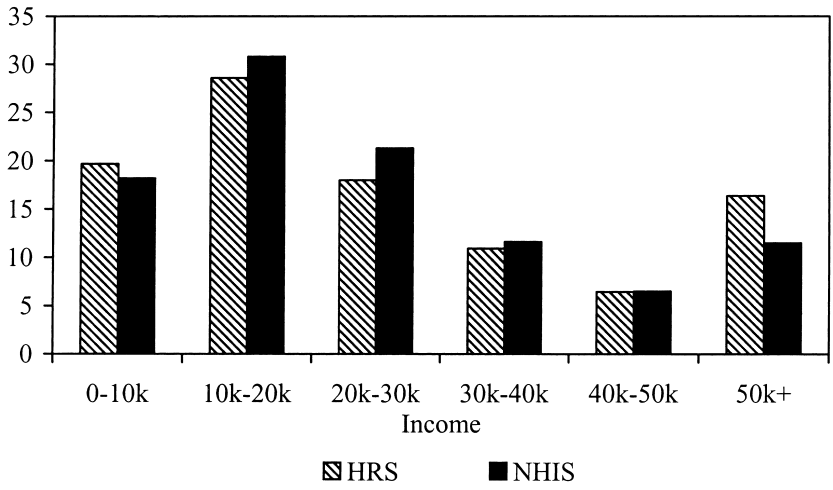

Fig. 6C.1 Income distribution (percentage)

HRS 1998 and in NHIS. The HRS sample has somewhat higher education levels than the NHIS. For example, in the HRS sample about five percentage points more attended some college or graduated from college than in the NHIS. While the differences are not large, the greater education in HRS could explain the higher fraction with income above $75,000, but it would not explain the greater fraction with income less than $10,000.

In AHEAD 1993, income was ascertained in the standard HRS manner by a series of questions about income from different categories such as dividends, earnings, and so forth. At the end of the income sequence the respondent for the household was also asked in one question for an annual total, much as in the NHIS. While some differences remain, we can get an idea of the observation error in income caused by the one-shot question by comparing the standard measure of income based on separate questions for each income category with the single-question measure.[2] As shown in table 6C.1, average income is similar: $24.5 thousand versus $21.3 thousand. Apparently the one-shot question undermeasures income by about 13 percent. However, the standard error is much smaller, $300 for the one-shot compared with $700 for the standard measure. This difference is a reflection of the tendency for the one-shot to pull reports toward the middle of the distribution.

Comparison of ADL Limitations between the HRS and NHIS

While the income comparisons accord with expectations, a more direct comparison is to compare the relationship between ADL limitations and

2. The standard measure and the one-shot measure were both gathered only in AHEAD 1993, which is the reason this analysis is based on AHEAD 1993.

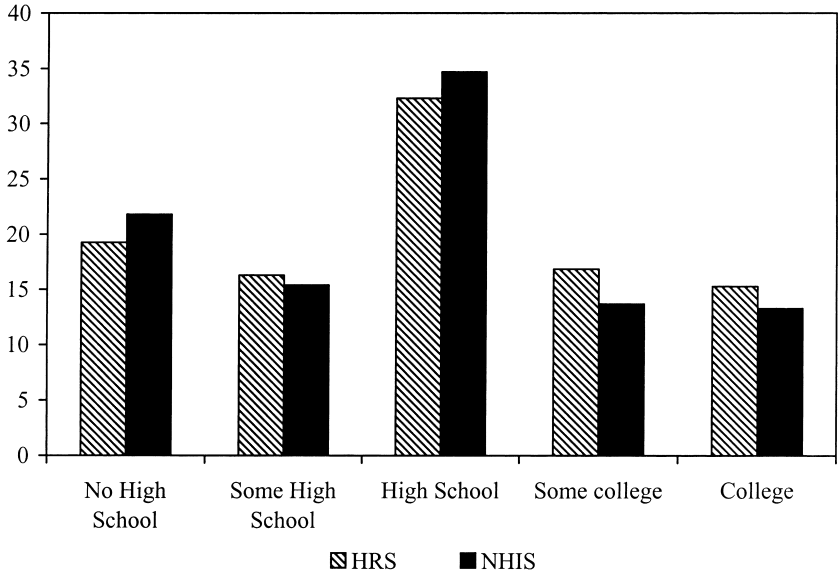

Fig. 6C.2 Distribution (percentage) of educational attainment

Table 6C.1 Income (thousands) in AHEAD 1993

	Mean	Standard error
Standard income assessment	24.5	0.7
One-shot income assessment	21.3	0.3

income in the HRS, where we believe we have an income measure that is relatively free of measurement error, with the relationship in NHIS, where we believe income has considerable measurement error, both systematic and random.[3] Even though the levels of ADL limitations in HRS and NHIS are very different, both measure some aspect of health and so should show variation with income and education in a manner that has been established in the literature. However, because the levels of ADL limitations are so different, I first show the relationship between ADL limitations and education. Figure 6C.3 shows the odds of having an ADL limitation by education category for the HRS and for the NHIS.[4] With the exception of the first education category, the odds levels and variation with education are

3. I will limit my discussion to ADL limitations because IADL limitations are more complex, reflecting individual choices about whether to perform an activity as well as intrinsic ability to perform it.

4. The odds ratios are adjusted for age and sex. The NHIS odds come from table 5A.3, renormalized on high school education (the largest education category). The HRS odds ratios are from my logistic regressions, based on HRS 1998.

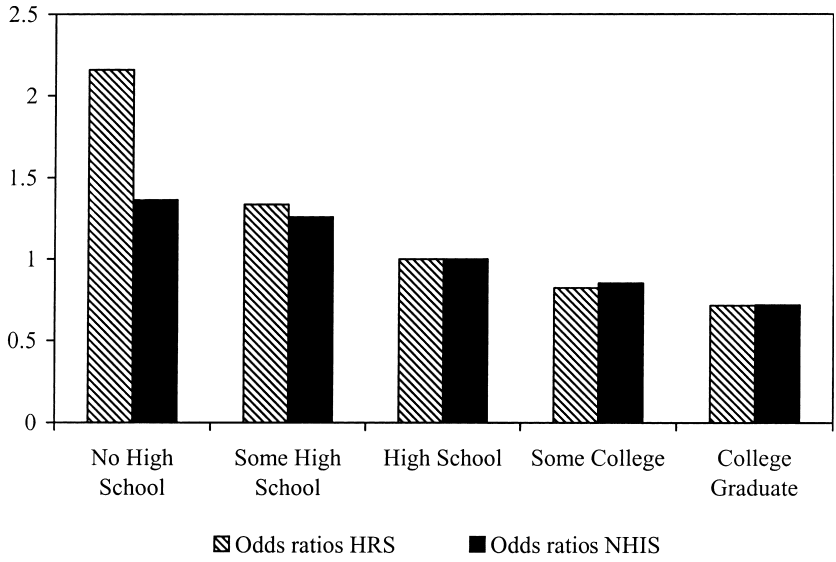

Fig. 6C.3 Relative odds of ADL limitation: Education

remarkably similar. Thus in the HRS the odds are about 38 percent higher among those with some high school (but not a high school degree) than among those with a high school degree; in the NHIS the odds are about 26 percent higher.

The patterns by income band are very different. Figure 6C.4 shows the adjusted odds ratios in the HRS and in the NHIS.[5] With the exception of the first income category, the odds ratios are essentially flat in the NHIS, whereas they show a sharp and (almost) consistent decline in the HRS. For example, among those with household income greater than $50,000 (about 16 percent of the sample in HRS) the odds are just 45 percent of the odds of those with household income of $20,000 to $30,000. This is the kind of relationship between income and health that is widely found by many researchers in many data sets.

When both income and education are included in the logistic specification and estimated over the HRS, the effects of education are attenuated as would be expected from the positive correlation between true income and education (fig. 6C.5).[6] Thus, the effect of "no high school" on relative risk is reduced from 2.12 in figure 6C.3 to 1.69 and the effect of "college grad"

5. The odds ratios are adjusted for age and sex. The odds ratios for the NHIS are based on table 5A.2, renormalized on income 10k–20k (the largest income category). The HRS odds ratios are from my logistic regressions, based on HRS 1998.

6. The odds ratios are adjusted for age and sex. The odds ratios for the NHIS are based on table 6.3, renormalized on income of 10k–20k, and high school education (the largest categories). The HRS odds ratios are from my logistic regressions, based on HRS 1998.

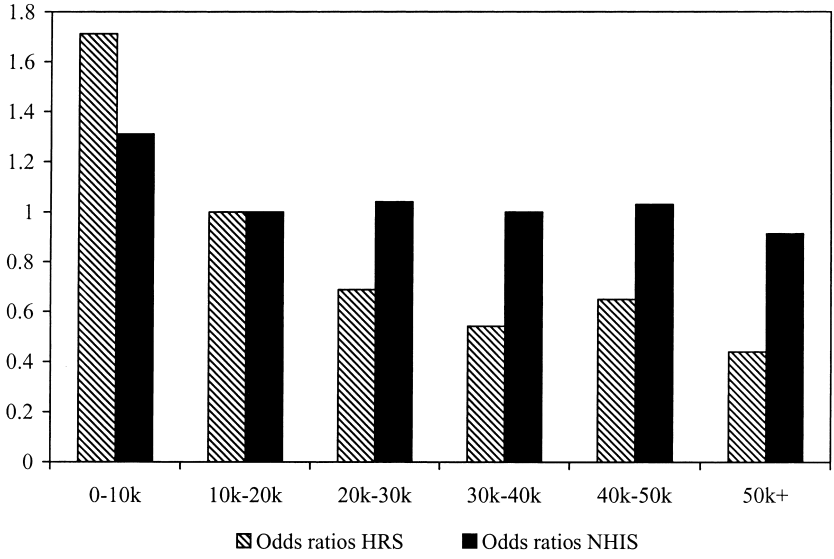

Fig. 6C.4 Relative odds of ADL limitation: Income

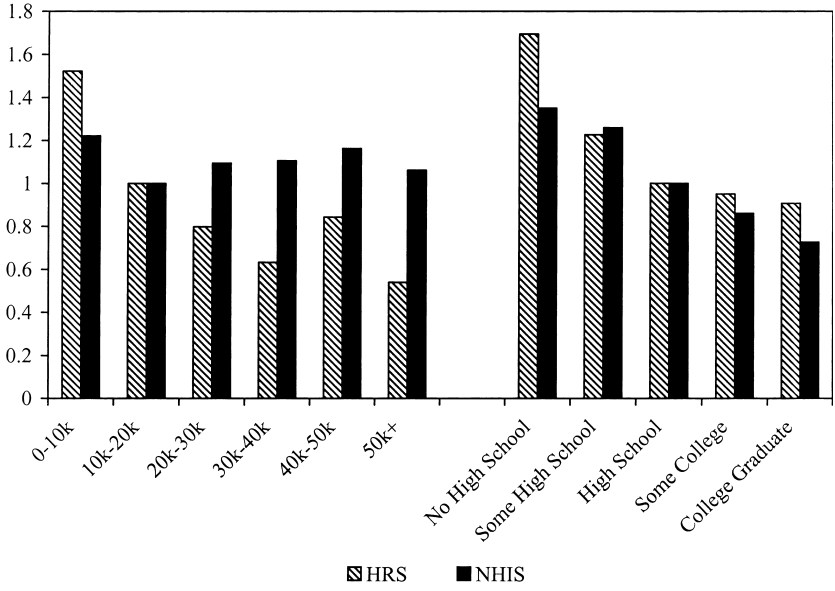

Fig. 6C.5 Relative odds of ADL limitation: Income and education

is reduced from 0.76 to 0.91. That is, the difference in relative risk between the lowest education band and the highest is reduced from 1.36 to 0.78 when income is included. In contrast, when income is included in the NHIS, relative risk with respect to education is virtually unchanged, as a comparison between figures 6C.3 and 6C.5 shows.

Conclusion

My discussion has been about the effects of the measurement of income on the estimation of the relationship between intrinsic ADL limitations and income and education. Measurement error on income will lead to underestimation of its effects, but because of the strong positive correlation between true income and education, the same measurement error will cause the effects of education to be overestimated. I found this to be the case in HRS data. Because of data limitations I did not perform similar analyses on coping and residual difficulties, but I expect that the results would be similar. I also noted the very low level of ADL limitations in the NHIS compared with other data sets. For these reasons I conclude that the results of this chapter need to be validated on a data set with a better measure of income and with a level of ADL limitations that is more consistent with data from other household surveys, such as the HRS, NLTCS, and MCBS.