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———. 1999. Inheritances and bequests. In *Wealth, work, and health: Innovations in measurement in the social sciences,* ed. J. P. Smith and R. Willis, 121–49. Ann Arbor: University of Michigan Press.

Wechsler, D. 1997. *Wechsler adult intelligence scale-III.* San Antonio, TX: The Psychological Corporation.

Willis, R. J. 2007. Cognitive economics and human capital. Presidential Address to Society of Labor Economists, Chicago, May 4–5.

Woodcock, R. W., K. McGrew, and N. Mather. 2001. *Woodcock-Johnson tests of cognitive abilities and tests of achievement (3rd edition).* Rolling Meadows, IL: Riverside Publishing.

———. 2003. *Woodcock-Johnson III Normative Update (NU) tests of cognitive abilities.* Chicago, IL: Riverside Publishing Company.

Comment Finis Welch

I should begin by saying to Mr. McArdle that while I do not know you, I know your coauthors. Someone should have warned you!

Actually this chapter follows a series of papers by Jim Smith that concentrate on wealth. I believe he has done more in this area than any other, especially in studying inequality and in validating the sequential series of questions HRS uses to elicit responses and in comparing the wealth levels in HRS to those of other sources. When Jim talks about wealth (aside from his own) we all listen. When he talks about his own, you should listen, but should not believe.[1] The chapter's innovation is the addition of the cognitive measures as they relate to the levels of wealth in HRS. To someone as old as I am, that is a scary issue. When I saw the title I expected the chapter to begin with a profile of cognitive measures across age that showed physical skills are not the only things that recede with age.

In fact, my main criticism of the chapter is that there are too few descriptive tables. I would love to have seen an age profile of wealth levels as well as one for the 2000 to 2006 changes that, along with 2006 levels of wealth, are analyzed in the chapter. Although I assume that there is a substantial literature on spending down, nothing would be lost if it were addressed here. We understand that the cross-sectional age profiles confuse age and cohort, but we ought to see what we are to be confused about. More important, it would be very nice to see the age profiles of test scores. In this case there would be no confusion between age and cohort.

If scores for older respondents are lower, it is cohort. If scores are higher

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1. I have known Jim for almost forty years. If he says "up" it is probably "down."

for older respondents, it is age, and if scores do not change, I will not worry. It would also be illuminating to explore the relation between test scores and education, holding age constant. If education proxies the skills acquired in school, including the ability to learn, then the test scores addressed here are alternative measures of these skills. As such, controlling for the test scores will dilute the linkage between wealth and education just as controlling for education will dilute the linkage between test scores and wealth. It would be interesting to see some of the calculations repeated when education is omitted, perhaps in an appendix, so that the cognitive measures are allowed to assume all of the correlated effects.

There is a lot here for one chapter. It is hard to keep track of the various tests. Not the statistical test, the alternative measures of cognitive skill. The descriptions of the tests and their relation to the concepts of flow and crystallized knowledge are interesting but they seem to have little to do with the empirical work to follow. The chapter's main objective is to see how cognitive ability affects wealth accumulation and maintenance. One wonders vis-à-vis wealth if there is a way of synthesizing the tests into a single measure. Since numeracy seems to have most of the predictive power, I wonder what would be lost if it were used alone? Personally, I would prefer to have the description of the tests and their relation to the flow and crystallized notions in an appendix.

More than any other thing, this chapter is exploratory. It simply searches for links between the various cognitive measures and levels of wealth at advanced ages. The unfortunate part of the story is that in these data we are unable to ask the most interesting questions. Since there is a positive relation between measured cognitive ability and wealth, those questions are:

1. Does the association only reflect the fact that those with greater cognitive ability (henceforth, "smarter people") earn higher incomes?
2. Does it reflect higher saving rates among smarter people (for given income)?
3. Do smarter people invest more productively (for given savings)?

If it is only the first, no one cares. The second would be interesting, but the third would be more so.

Unfortunately, to answer the fundamental questions we would have to have younger people than those found in the HRS.

Despite the inability to address these questions, specification searches can provide some insight. Compare table 7.2 to table 7.4. The ordinary least squares (OLS) estimates in 7.2 provide means of wealth conditional on the test scores and the other controls while the quantile estimates in 7.4 provide the twenty-fifth, median, seventy-fifth, and ninetieth centiles of the wealth distribution, conditional on the same controls.

The text of the chapter points to the estimates in 7.4 and notes that the coefficient on the score on numerical ability increases as one moves from lower to higher quantiles. Since the coefficient on numerical ability in the mean regressions (table 7.2) is positive, the authors point out that this is exactly what one would expect. In fact, at the conference where this chapter was presented, Smith skipped the quantile regressions altogether saying that they provided nothing new. Wrong!

I personally believe that the contrast between the mean and quantile estimates provide the most interesting feature of the empirical work.

As background, think of the classic bivariant regression where the right-hand side (RHS) variable, x, is distributed on the real line and the left-hand side (LHS) variable, y given x, is normal with i.i.d. residuals. If the line is $y = a + bx + u$, then the mean regression (OLS) provides best linear unbiased estimator (BLUE) estimates of a and b. In this case the quantile lines are exactly parallel to the mean, which is $a + bx$. The first quartile is 0.67 standard deviations of the residual, u, below the mean, the median is also the mean since the distribution of y given x is symmetric and the third quartile line has gradient b with intercept $a + .67$ sigma(u). Actually, for the classic case with i.i.d. residuals, the easiest way to calculate the quantile regressions is to run the OLS regression and then use the empirical residuals to calculate shifts in the intercept for the various quantiles. Now consider a case of heteroskedastic residuals.

For simplicity assume that the mean line has zero gradient, that residuals are independent and symmetric, and that the standard deviation of the residuals is increasing in x. In this case the quantiles show increased spread as we move to progressively higher levels of x. All quantiles below the median will have negative gradients and the gradient will be lower at lower quantiles. The gradients for the quantiles above the median will be the exact mirror image of those below. For equal absolute differences of quantiles from the median, the absolute values of the gradients will also be equal. If the mean line has a positive (negative) gradient then that positive (negative) number will simply be added to each of the quantile gradients. With this in mind, return to the contrast between tables 7.2 and 7.4.

Here, in table 7.4, the increasing gradient for the score on the test of numerical ability in the quantile regressions as we move to higher quantiles shows that the variance of wealth increases as the numerical score increases. That, to my mind, suggests that the numerically proficient take more risks. Table 7.2 shows higher average levels of wealth for higher scores on the numerical ability test so it appears that there is a trade—higher risk for higher expected return. This may be pushing the results too far (i.e., taking them too literally), but the two results are at least suggestive. This, of course, is only a small part of the chapter.

The analysis of couples is particularly interesting. Even if dumb husbands say they make the investment decisions, their wealth seems to be higher if they are married to a smart wife. While you may think this is because the dumb guys listen to their wives, it may only be that the smart wives earn more.

It is a fun chapter. I recommend it.