Do different dimensions of male high school students' skills predict labor market success a decade later? Evidence from the NLSY

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Abstract

This paper uses data from the National Longitudinal Survey of Youth to examine whether measures of the skills of male teenagers predict their wages at ages 27 and 28. Three types of skills are examined: academic skills, skill at completing elementary mental tasks quickly and accurately, and self-esteem. Psychological literature supports the position that self-esteem may predict subsequent wages because it predicts the ability to work productively in groups and perseverance in the face of adversity. The results show that all three types of skills play roles in predicting subsequent wages. The different skills are of differing importance in explaining gaps between the average wages of White males and those of Black males and Hispanic males. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Since 1980, inequality in the earnings of American workers has increased markedly. Increasing differentials between the earnings of workers with different educational attainments are part of the story. An increase in earnings inequality among workers with the same educational attainments is another part. Most economists agree that these trends stem, at least to some extent, from an increasing demand for skills. The argument is that employers are willing to pay an increasing premium for college graduates over the cost of hiring high school graduates because college graduates are more likely to possess skills critical in today's businesses. Similarly, the widening earnings inequality among, say, high school graduates is thought to reflect an increasing demand for skills that some high school graduates possess and others do not.

For educators and parents, the skills explanation of recent wage trends prompts the question: Exactly what skills are valued in the labor market? The publication in 1994 of Richard Herrnstein's and Charles Murray's book, The Bell Curve, heightened interest in this question. Recalling the work of the psychologist, Charles Spearman (1904), Herrnstein and Murray (H & M) argued that one latent ability factor called g (for general intelligence) explains the high correlations among scores on different achievement tests administered to the same

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See, for example, Katz and Murphy (1992) and Juhn, Murphy, and Pierce (1993). Katz and Murphy show that supply changes as well as demand changes contribute to recent trends in education-related earnings differentials.
persons. They refer to this latent ability factor as intelligence. Moreover, they argue that it is this intelligence that is increasingly valued in the labor market.

The H & M thesis clashes with the views of many psychologists, including Howard Gardner and Robert Sternberg, who argue that there are many dimensions to intelligence and that the dimensions are not highly correlated. In Gardner’s words, most people exhibit “jagged profiles”.

We make reference to the debate between Herrnstein and Murray and their critics because H & M base their book on analyses of the same data set we use in the research reported in this paper. Moreover, H & M’s measure of “intelligence” (each individual’s AFQI score) is virtually identical to the measure of academic skills that we construct. However, we want to be clear that we view academic skills as well as the other skills we study as not solely determined by genetic endowments. To the contrary, we view all of the skills discussed in this paper as influenced by education, training, and other life experiences. The work of Korenman and Winspeck (1995) supports this position.

Several types of disparate evidence support the hypothesis that different dimensions of skills are important in the labor market. First, in exploring why wages are higher for observationally similar workers in computer-intensive industries such as accounting and insurance than in other industries, Bartel and Sicherman (1999) use a person-specific fixed effects approach to show that computer-intensive industries attract particularly able workers. However, they also report that the AFQI scores of workers (the skill measure that H & M emphasize) do not capture all of the skills that are especially important to employers in technologically progressive industries. This raises, of course, the question of just what are the other skills critically important in these industries.

Second, a number of studies have shown that the ability to do relatively simple mental tasks (such as filing) quickly and accurately is rewarded in the labor market (Heckman, 1995). In today’s workplaces where computers carry out an increasing amount of routine, algorithmic-based work, the relevant skill may have a lot to do with the ability to read poor handwriting accurately — something that many humans do well, but that is very difficult to program computers to do (Murnane et al., 1999).

Third, a number of studies show that indicators of non-cognitive skills predict labor market outcomes. For example, Duncan and Dunifon (1998) show that a measure of the cleanliness of an individual’s home predicts subsequent labor market success. Filer (1981) and Goldsmith, Veen, and Darity (1997) show that measures of personality traits or affective skills predict concurrent wages.

In this paper we seek to increase understanding of the roles different types of skills play in predicting subsequent labor market performance. We base our work on the National Longitudinal Survey of Youth (NLSY), the data set used by H & M and many other researchers. Building on prior work, we constructed a measure of academic skills and a measure of the ability to do speeded tasks accurately. We also searched the NLSY’s data base for measures of respondents’ non-cognitive skills. We found that the NLSY includes participants’ responses in 1980 and again in 1987 to a small number of questions taken from an established test battery measuring global self-esteem. As we explain below, the psychological literature reports correlations between self-esteem and particular non-cognitive skills that may affect labor market performance. These correlations suggest that the self-esteem of teenagers might predict their wage levels a decade later.

One reason that we decided to explore the role of self-esteem in explaining subsequent wage levels is that this construct has a controversial history. Titles such as “Crying Shame: The Failures of Self Esteem” (Miller, 1995) reveal some analysts’ view that attempts by educators to improve children’s self-esteem simply drain needed instructional time away from the real mission of schools — that is, helping children to acquire the academic skills necessary for life success. Other analysts argue that affective skills such as self-esteem have strong influences on life outcomes (e.g., Becker & Hills, 1981; Frost, 1991; Gurdon, 1994), and consequently devoting resources to improving students’ affective skills may be just as important as devoting resources to improving students’ cognitive skills. We are agnostic about the importance of self-esteem, but believe it is important to get beyond inflammatory rhetoric and examine the issue empirically.

2. Research strategy

Our research strategy was heavily influenced by that of Neal and Johnson (1996). These authors use data from the NLSY to show that much of the gap between the average wages of White males and Black males is attributable to the lower average academic skill levels of Black males. Most important for our work are several aspects of their research strategy:

2 The NLSY also contains participants’ 1980 responses to questions taken from an instrument developed by Rutter (1966) to measure locus of control. Goldsmith et al. (1997) report that locus of control, measured in 1980, predicts 1987 self-esteem, which, in turn, predicts 1987 wages. We constructed a locus of control composite from the 1980 responses to these questions and found that the composite did not predict wages in the early 1990s in models that controlled for measures of cognitive skills.
• The sample is restricted to males whose cognitive skills were measured during the high school years, before labor market activities could influence skill levels.

• Family background variables are not included as controls in the regression models because, they argue, family background impacts labor market success via skill acquisition and they wanted to estimate the full impact of one type of skill on subsequent wages.

• Years of completed education, residential location, and occupation are not included as controls in the regression models because all of these variables are, to some degree, choices made by individuals and may therefore reflect mechanisms through which skills impact on later labor market outcomes.

• The measure of labor market success is the logarithm of average real wages in 1990 and 1991. By measuring wage a decade after the skills of teenagers were measured, time is provided for sample members to complete post-secondary education and to demonstrate their skills to employers.5

Neal and Johnson's (1996) paper makes an important contribution to the understanding of one aspect of earnings inequality. We modeled our own research strategy closely on theirs to facilitate comparisons of the two sets of results.

3. Contributions of this study

We view our paper as contributing in three ways to understanding the impacts of teenagers' skills on their subsequent labor market success. First, we examine the sensitivity of the estimated skill-wage relationships to inclusion in the model of other skill measures. Second, we examine the extent to which indicators of speed and self-esteem contribute to explaining wage differentials between White males and minority males, following up on Neal and Johnson's (1996) work showing that differences in academic skills contribute to explaining the Black-White wage differential. Third, we explore the stability of the measure of self-esteem between 1980, when sample members were teenagers, and the measure in 1987, when the sample members were in their early to mid-20s. We explore whether the self-esteem indicators, measured seven years apart, both contribute information useful in predicting subsequent wages.

4. Data set and sample

The NLSY contains information on the schooling and labor market experiences of a stratified random sample of 12,686 individuals who were between the ages of 14 and 22 when first surveyed in 1979. This data set has several characteristics that make it valuable for addressing our research questions. First, the labor market careers of respondents have been tracked into the mid-1990s, providing ample time for respondents to demonstrate their skills to employers. Second, in 1980, 94 percent of the participants completed the Armed Services Vocational Aptitude Battery (ASVAB), a two and one-half hour set of 10 multiple-choice tests designed to provide information on a variety of cognitive skills. Third, in that same year 96 percent of NLSY participants completed a series of questions taken from an established instrument constructed to measure self-esteem.

In our analyses, we included the 1448 males who were born after 1961, completed the ASVAB, completed the self-esteem instrument in 1980 and then again in 1987, and reported working for a wage at either age 27 or age 28. Following Neal and Johnson (1996), we excluded the older NLSY cohorts in order to focus on the impact of skills measured during the high school years on subsequent wages.6 If labor market experiences themselves affect cognitive or affective skills, then our research design would have been contaminated by including in the sample individuals who already had significant labor market experience when the skill instruments were administered.

5. Measures

5.1. Wage

Our dependent variable is the natural logarithm of the average hourly wage during the two years that the respondents were aged 27 and 28. Nine percent of the analytic sample worked for a wage at age 27, but not at age 28; eleven percent worked for a wage at age 28, but not at age 27. In cases in which individuals reported a wage in only one of these years, that wage alone was used to construct the dependent variable. Dichotomous indicators identifying individuals who reported a wage in one of the two years, but not the other, were included as controls in our analyses.

5 Altonji and Pierret (1996), Farber and Gibbons (1996) and Oettinger (1996) present models explaining why it may take workers several years in the labor market to signal skill levels.

6 Also following Neal and Johnson (1996), we combined the NLSY nationally representative cross-sectional sample and the supplemental samples of Blacks and Hispanics, eliminating the supplemental sample of poor Whites.
5.2. Academic

Using methods described in Appendix A, we constructed a measure of academic skills from each respondent’s scores on four of the 10 ASVAB tests. The four are multiple choice tests of word knowledge, paragraph comprehension, mathematics knowledge, and arithmetic reasoning. We adjusted the academic skills measure for differences in the ages of respondents, and transformed it to a z-score (with a mean of zero and a standard deviation of one in the population). Academic is almost identical to the AFQT score used by Herrnstein and Murray (1994) and Neal and Johnson (1996) in their analyses.

5.3. Speed

In a similar fashion, we formed a measure of each respondent’s skill in performing relatively simple mental tasks rapidly and accurately by composing scores from the ASVAB on speeded tests of numerical operations and coding speed. In forming the Speed composite from these two tests, we followed the advice of Back and Moore (1986).

5.4. Esteem

We constructed a composite measure of “global” self-esteem from responses to the first seven items in the ten-item Self-Esteem Scale (Rosenberg, 1965). NLSY participants completed this scale in 1980. These questions probe whether the respondent feels he is a “person of worth,” and a person “able to do things as well as most other people.” All 10 items are listed in Appendix A, which also describes how we constructed the composite.

Our reading of the psychological literature led us to conclude that the self-esteem of a high-school-aged male might be positively correlated with two kinds of skills relevant to employers a decade later: the ability to work productively in groups and perseverance in the face of adversity. Evidence supporting the relationship to working effectively in groups comes from studies showing that global self-esteem is negatively correlated with depression, resentment, tension, irritability, and guilt, each of which may hinder an individual’s ability to work productively with co-workers (Rosenberg, 1965; Wylie, 1979). Goldsmith et al. (1997, p. 816), cite Brockner (1988) as arguing that self-esteem is positively related to productivity because “…workers high in self-esteem exercised a more efficient use of group time by exhibiting a willingness to consider a wider range of solutions to problems; and they were more confident decision makers”.

Evidence supporting the relationship of self-esteem with perseverance comes from evidence that children who feel helpless are unlikely to persevere in the face of obstacles (Dweck & Leggett, 1988). Finally, an individual’s global self-esteem score may capture elements of “emotional intelligence”, a concept that Daniel Goleman (1995) has recently made popular. Goleman argues that emotional intelligence is important in the workplace because it captures “abilities such as being able to motivate oneself and persist in the face of frustrations; to control impulses and delay gratification; to regulate one’s moods and keep distress from swamping the ability to think; to emphasize and to hope…” (p. 34).

5.5. Calendar year

Since the analytic sample consists of males who were between the ages of 15 and 18 when they completed the ASVAB in 1980, they reached the age of 28 (when their wages were measured) during four different calendar years. To account for differences in labor market conditions across the four years (1990–1993), we include dummy variables representing three of the four years as control predictors in the analysis.

Table 1 provides descriptive statistics for variables used in our analyses, both for the full sample, and by racial/ethnic group. The average hourly wage at ages 27 and 28 (expressed in 1993 dollars) is $12.07 for White males, $9.23 for Black males, and $10.63 for Hispanic males. Inspection of the distribution of the skill measures shows that the average score of Black males on the Academic composite is approximately one standard deviation below the average score for White males, with the average score of Hispanic males falling between the averages for the other two groups. A similar pattern holds for the Speed composite, although the differences are not quite so large. There are only very small differences across racial/ethnic groups in the average scores on the Esteem measure. The average score for Hispanic males is slightly lower than the average score for Black males.

Table 2 lists correlations (adjusted for measurement error) among the skill measures for the three
dimensions.

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5 We conducted a principal components analysis of the ten items and found initially that there appeared to be two dimensions, one loading heavily on the first seven items and a second loading heavily on the last three items. Melver and Carmines (1981) conducted the same analysis and concluded that the second factor was an artifact of the wording of the items, and was not a substantively different dimension.

6 As explained in the next section, the skill measures are measured with error. We have an estimate of the reliability of each of these variables. To adjust the observed correlation between any two of these variables for measurement error, we divided the observed correlation by the square root of the product of their reliabilities.
Table 1
Mean (and standard deviation) of selected variables, including hourly wage at age 27/28 and skill measured during high school, for the full sample and by race/ethnicity

<table>
<thead>
<tr>
<th>Variable</th>
<th>Full sample n=1448</th>
<th>By race</th>
<th>Black n=429</th>
<th>Hispanic n=267</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>White n=752</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average hourly wage (in 1993 $)</td>
<td>10.96 (5.46)</td>
<td>12.07 (5.36)</td>
<td>9.23 (4.97)</td>
<td>10.63 (5.73)</td>
</tr>
<tr>
<td>Wage missing at age-27</td>
<td>0.112</td>
<td>0.094</td>
<td>0.140</td>
<td>0.117</td>
</tr>
<tr>
<td>Wage missing at age-28</td>
<td>0.091</td>
<td>0.073</td>
<td>0.114</td>
<td>0.105</td>
</tr>
<tr>
<td>Logarithm of average hourly</td>
<td>2.294 (0.463)</td>
<td>2.400 (0.433)</td>
<td>2.113 (0.450)</td>
<td>2.246 (0.474)</td>
</tr>
<tr>
<td>wage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic skill</td>
<td>-0.297 (1.047)</td>
<td>0.142 (0.982)</td>
<td>-0.895 (0.858)</td>
<td>-0.574 (0.930)</td>
</tr>
<tr>
<td>Speed</td>
<td>-0.411 (1.003)</td>
<td>-0.088 (0.936)</td>
<td>-0.881 (0.929)</td>
<td>-0.566 (0.964)</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-0.039 (0.991)</td>
<td>0.009 (0.976)</td>
<td>-0.027 (1.037)</td>
<td>-0.194 (0.947)</td>
</tr>
</tbody>
</table>

Table 2
Sample inter-correlations (corrected for measurement errors) among the skill measures, by race/ethnicity

<table>
<thead>
<tr>
<th>Race</th>
<th>Variable</th>
<th>Skill measures</th>
<th>Academic</th>
<th>Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>White (n=752)</td>
<td>Speed</td>
<td>0.783</td>
<td>0.275</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Esteem</td>
<td>0.241</td>
<td>0.387</td>
<td></td>
</tr>
<tr>
<td>Black (n=429)</td>
<td>Speed</td>
<td>0.690</td>
<td>0.387</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Esteem</td>
<td>0.413</td>
<td>0.387</td>
<td></td>
</tr>
<tr>
<td>Hispanic (n=267)</td>
<td>Speed</td>
<td>0.751</td>
<td>0.387</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Esteem</td>
<td>0.572</td>
<td>0.387</td>
<td></td>
</tr>
</tbody>
</table>

6. Statistical analyses

We fitted a taxonomy of regression models to explore the impact of skills on wages. Our first two models were similar to models emphasized by Neal and Johnson (1996). Model 1 predicts log wage at age 27/28 as a function of race and ethnicity (controlling for calendar year and whether the individual reported a positive wage for only one of the two years). Models 2, 3 and 4 include one of the three skill measures. Model 2, which includes Academic, can be compared directly to Neal and Johnson's (1996) results. Model 5 includes all three skill measures. The coefficients on the skill measures in Model 5 capture the total effects of the skills on subsequent wages, holding constant the levels of the other skills.

In our analyses, we treated the predictors Academic, Speed, and Esteem as fallible measures of the corresponding underlying true skills. As is well known, the presence of measurement error in the predictors produces bias in parameter estimates obtained by ordinary least squares. We applied the reliability-based maximum-likelihood methods of correction described by Fuller (1987) and Greene (1997) to disattenuate parameter estimates and associated inferential statistics.7

We investigated whether the relationships between each of the three skill measures and wage at age 27/28 varied by race/ethnicity. We found no statistically significant evidence that the relationship of any of the three skill measures to subsequent wage was different for Black or Hispanic males than it was for White males.8

7 The reliabilities used in fitting the error-corrected models were estimated from item-level scores using internal consistency methods, and are Academic (0.948), Speed (0.884), Esteem (0.838). Our technique for measurement error adjustment is described in the errors-in-variables regression section of the STATA manual. While the values of the coefficients in Table 3 do, of course, depend on the assumed reliabilities, the results reported in the paper are not substantively different when the models are fitted under the assumption that the skills are measured without error (i.e. all reliabilities=1.0).

8 Since we assume that the three skill predictors measure the underlying constructs with error, our tests of interactions between each skill measure and the predictors, Black and Hispanic, had to take into account that the interaction terms were also measured with error. Our analyses also took into account the specific pattern of covariances among the measurement errors in the main effects of skill and their interactions with black and Hispanic. We used Fuller's EV-CARP software to conduct these tests. Our results differ from those of Neal and Johnson (1996), who report that the relationship between academic skill and subsequent wage is different for Hispanic males than for Black males and white males. The explanation for this difference between our results and Neal and Johnson's is that they assume that skills are measured without error.
Table 3
A taxonomy of fitted regression models presenting the prediction of the natural logarithm of average hourly wage at ages 27-28 by selected skills measured in high-school, controlling for race/ethnicity (standard errors in parentheses). The model fits have been corrected for the presence of measurement error in the academic, speed, and esteem predictors (n=1448).

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Model#1</th>
<th>Model#2</th>
<th>Model#3</th>
<th>Model#4</th>
<th>Model#5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>2.422** (0.043)</td>
<td>2.419** (0.040)</td>
<td>2.457** (0.040)</td>
<td>2.436** (0.042)</td>
<td>2.445** (0.040)</td>
</tr>
<tr>
<td>Black</td>
<td>-0.284** (0.027)</td>
<td>-0.081** (0.028)</td>
<td>-0.122** (0.027)</td>
<td>-0.279** (0.026)</td>
<td>-0.089** (0.028)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-0.148** (0.032)</td>
<td>-0.069 (0.031)</td>
<td>-0.050 (0.030)</td>
<td>-0.127 (0.031)</td>
<td>-0.016 (0.030)</td>
</tr>
<tr>
<td>Academic</td>
<td>0.192** (0.012)</td>
<td></td>
<td></td>
<td></td>
<td>0.099** (0.022)</td>
</tr>
<tr>
<td>Speed</td>
<td></td>
<td>0.201** (0.013)</td>
<td></td>
<td></td>
<td>0.110** (0.023)</td>
</tr>
<tr>
<td>Esteem</td>
<td></td>
<td></td>
<td>0.105** (0.014)</td>
<td></td>
<td>0.057** (0.014)</td>
</tr>
<tr>
<td>Cohort dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Missing wage dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R² Statistic</td>
<td>0.081</td>
<td>0.221</td>
<td>0.223</td>
<td>0.123</td>
<td>0.245</td>
</tr>
</tbody>
</table>

* *P<0.05, **P<0.01.

7. Results

7.1. Race/ethnicity wage differentials

Model 1 of Table 3 displays the same pattern documented in Table 1 and in other empirical studies: on average, Black and Hispanic men earn considerably less than White men. These point estimates imply that the average hourly wage of 27/28 year-old Black males is 25 percent less, and of Hispanics is 14 percent less, than that of White males of the same age.⁹

7.2. The impact of skills

7.2.1. Academic

Model 2 of Table 3 replicates a pattern emphasized by Neal and Johnson (1996): academic skills measured during the high school years are important predictors of wages a decade later. Regardless of their race, males with greater academic skills as teenagers tend to be rewarded subsequently in the labor force. Comparing the coefficients associated with race/ethnicity in Models 1 and 2 indicates that more than two-thirds of the wage differential between Black males and White males and virtually all of the wage differential between Hispanic males and White males can be explained by differences among these groups in average academic skills and average levels of other skills such as Speed that are correlated with the academic skill measure.

7.2.2. Speed

Model 5 of Table 3 demonstrates that Speed is also an important predictor of subsequent wages. Estimated in a model that controls for Academic (and Esteem), skill in carrying out routine mental tasks quickly and accurately is rewarded in the labor force. Notice also that the inclusion of Speed as a predictor in the regression model reduces the estimated impact of academic skills on wages (compare the coefficients on Academic in Models 2 and 5).¹⁰

7.2.3. Esteem

Model 5 of Table 3 shows that self-esteem as measured during the high school years does play a statistically significant role in predicting wages a decade later, even in a model that controls for academic skills and the ability to carry out speeded tasks accurately. On average, someone whose self-esteem is one population standard deviation above average is predicted to have a wage at age 27/28 that is 3.8 percent above average (Model 5).

Comparison of the coefficient on Esteem in Model 4 with the corresponding coefficient in Model 5 illustrates that the estimated impact of Esteem on subsequent wages is very sensitive to the inclusion of other skill measures in the model. The coefficient on Esteem in Model 4, which does not include the Academic and Speed measures, is much larger than the analogous coefficient in Model 5, which does include these skill measures. This pattern reflects the positive correlations of Esteem with Academic and Speed. But the important point is that, even when the Academic and Speed composites are included in the model, a measure of Esteem continues

⁹ The percentage differences in wages cited here were estimated from the relevant regression coefficient, \( \beta \), using the formula: \( e^{\beta} - 1 \).

¹⁰ Heckman (1995) reported this same pattern.
to provide additional information useful in predicting wages a decade after high school.

Interestingly, comparison of the coefficients on Black and Hispanic in Models 1 and 4 shows that the measure of self-esteem plays virtually no role in explaining the Black–White wage differential or the Hispanic–White wage differential. The explanation is straightforward: the average self-esteem scores of Black, Hispanic and White males are very similar (see Table 1). In contrast, the inclusion of either Academic or Speed in the model dramatically reduces the negative coefficients on the Black and Hispanic indicators.

7.3. Are some skills more important in predicting subsequent wages?

This question inevitably comes to mind after perusing the fitted models of Table 3, but it is difficult to answer. As Goldberger and Manski’s note (1995, p.769) in their criticism of Herrnstein and Murray’s (1994) comparisons of the relative importance of standardized measures of IQ and socioeconomic status in explaining labor force outcomes: “...standardization accomplishes nothing except to give quantities in noncomparable units the superficial appearance of being in comparable units. This accomplishment is worse than useless — it yields misleading inferences.”

One reason comparisons of the coefficients on the standardized skill measures in Table 3 may be misleading is that they provide no information about the relative costs associated with increasing the levels of teenagers’ academic, speed, and self-esteem skills. Second, our analyses are descriptive. They show that in a national sample of teenagers whose skills were measured in 1980, those with relatively high skill levels earned more a decade later than those with relatively low skills. We do not model the process by which individuals in the sample acquired their skills. Consequently, we cannot assume that the coefficients in Table 3 would predict accurately the effect on subsequent wages of an educational program that did increase the skills of male teenagers.

8. Stability of self-esteem over a seven-year period

Members of our analytic sample not only answered the questions in 1980 from which we formed the Esteem composite, they also answered the same questions during a 1987 interview. From these responses we formed a composite measuring their self-esteem (Esteem87) during their early 20s. The correlation (adjusted for measurement errors) between the Esteem and Esteem87 composite is 0.439. The modest size of this correlation suggests that self-esteem is not an unchanging personality trait, but rather a view of self that is affected by experiences.

Table 4 shows the results of fitting a set of models in which we examined the extent to which the 1980 and 1987 self-esteem measures predict subsequent wages. For purposes of comparison, Model 1 in Table 4 replicates Model 5 from Table 3. Model 2 shows that the 1987 self-esteem measure predicts subsequent wages in a model that controls for 1980 Academic and Speed scores just as the 1980 esteem score did. Model 3 shows that the 1987 self-esteem measure does a better job of predicting subsequent wages than does the 1980 measure. This is hardly surprising since males in the sample knew a lot more about their completed educational attainments and life prospects in 1987 than they knew in 1980.

9. Discussion

The evidence presented in this paper supports the position that the labor market rewards a variety of different kinds of skills. Moreover, as measured during the high school years, the correlations among three valued skills are modest. An interesting question to explore in the future is whether the increasing prevalence of computers in work places will result in a decline in the payoff to Speed. Autor, Levy, & Murnane (2000) present preliminary evidence supporting this proposition by showing that rapid computerization in an industry is associated with a declining relative demand for routine manual skills and routine information processing skills.

The finding that least reflects patterns found in prior work is that high-school-aged males with high self-esteem as teenagers earn more in their late 20s than males who had the same cognitive skills as teenagers but lower self-esteem. Earlier in the paper, we suggest two complementary explanations: individuals with high self-esteem may be particularly good at working productively in groups and may have particularly great perseverance when confronted with difficult challenges. Both of these explanations are consistent with other evidence on

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11 Using the Cronbach’s Alpha generated in constructing the Esteem87 composite, we estimate its reliability to be 0.849.

12 While we argue above that it is inappropriate to compare the sizes of the regression coefficients on different skill measures such as Academic and Speed, it does seem appropriate to compare the sizes of the coefficients on the Esteem (80) and Esteem87 skill measures since they are composites constructed from respondents’ answers to the same questions in different years.

13 Goldsmith et al. (1997) report that self-esteem is correlated with contemporaneously measured wages. These authors view self-esteem and wages as jointly determined.
The Rosenberg 10-Item Self Esteem Scale

1. I feel that I am a person of worth, at least on an equal basis with others.
2. I feel that I have a number of good qualities.
3. I am inclined to feel that I am a failure.
4. I am able to do things as well as most other people.
5. I feel that I do not have much to be proud of.
6. I take a positive attitude toward myself.
7. At times I think I am no good at all.
8. On the whole, I am satisfied with myself.
9. I wish I could have more respect for myself.
10. I certainly feel useless at times.

Respondents were asked to provide one of the following responses to each item:

1. strongly agree with the statement
2. agree
3. disagree
4. strongly disagree

We inverted responses to the starred items so that a score of 4 corresponded to "high" self-esteem. We constructed a composite measuring self-esteem from responses to the first seven items.

References


Rotter, J.B., 1966. Generalized expectancies for internal versus
external control of reinforcement. Psychological Monographs 80 (1, Whole No. 609).
