NBER WORKING PAPER SERIES

SEX-BASED DIFFERENCES IN SCHOOL CONTENT AND THE MALE/FEMALE WAGE GAP

Charles Brown
Mary Corcoran

Working Paper 5580

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
May 1996

Our thanks to seminar participants at Dartmouth, Maryland, Michigan, Rice, Texas A&M, and the W.E. Upjohn Institute, and to the referee, for helpful comments; to Greg Acs, Marshall Cummings, and Marsha Silverberg for research assistance; and to the Rockefeller Foundation for financial support. This paper is part of NBER's research program in Labor Studies. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

NBER Working Paper 5580
May 1996

SEX-BASED DIFFERENCES IN SCHOOL CONTENT AND THE MALE/FEMALE WAGE GAP

ABSTRACT

In high school and in college, men and women take significantly different courses. Using data from the Survey of Income and Program Participation and the National Longitudinal Study Class of 1972, we relate these differences in school content to sex differences in adult wages.

Differences in field of highest degree account for a significant part of the male-female wage gap among college graduates, but differences in coursework account for very little of the equally large wage gap between men and women with less schooling. We find little consistent evidence that men receive larger rewards for taking traditionally male rather than traditionally female courses and majors, though there is some indication of this for college graduates.

Charles Brown
Department of Economics
University of Michigan
Ann Arbor, MI 48109-1220
and NBER

Mary Corcoran
School of Public Policy Studies
University of Michigan
Ann Arbor, MI 48109-1220

Schooling is regarded as a major investment in human capital which enhances later career opportunities and wages. Empirical research has shown that race-based differences in the quantity and quality of schooling account for a sizeable part of the race-based wage gap (Smith and Welch, 1977 and 1986; Duncan et al., 1984; Card and Krueger, 1992), but that sex-based differences in quantity of schooling explain very little of the male/female wage gap, largely because men and women average similar years of schooling (Blinder, 1973; Oaxaca, 1973; Treiman and Hartmann, 1981; Marini, 1989; Corcoran and Duncan, 1979).[1]

Differences in content of schooling may be far more important for explaining the male/female wage gap (Polachek, 1978; Eccles and Hoffman, 1984; Corcoran and Courant, 1989; Marini, 1989; Gunderson, 1989). There are sizeable sex-based differences in the kinds of training and skills acquired in schools (Polachek, 1978; Eccles and Hoffman, 1984; Marini, 1989; Eccles, 1984; Jacobs, 1985; Blau and Ferber, 1992). In high school boys are more likely than girls to take advanced math and science courses while girls are more likely to take foreign languages (Fox et al., 1979; Marini, 1989; Fennema and Sherman, 1979). In college women enroll in very different majors than do men, and while some of these sex differences (particularly those in previously "male" majors) have narrowed over time, large differences still remain. For instance, in 1968, 8.7 percent of all business degrees, .6 percent of all engineering degrees, 13.6 percent of all physical science degrees, and 37.1 percent of all mathematics degrees went to women (Jacobs, 1989, p. 126). By 1991 these figures had risen to 47.2%, 15.4%, 31.5%, and 47.2% respectively (National Center for Education Statistics, 1993). Typically "female" majors have not experienced comparable inflows of men. In 1968, 75.9 percent of all education degrees, 77.8 percent of all health professions degrees, and 97.3 percent of all home economics degrees went to women (Jacobs, 1989, p. 110). In 1991, the corresponding percentages were virtually identical.

Girls and boys clearly leave school with different kinds of training, and these training differences could potentially explain a great deal of the differences between men's and women's wages. There are several reasons to suspect that content of schooling "matters" for wages and for the sex-based wage gap. First, as suggested by Paglin and Rufolo (1990). certain majors and certain courses may develop more valuable job-related human capital than do other majors and courses. A second possibility is that differences in school content arise from differences in students' abilities or preferences, and that these differences, not school content, lead to higher wages. A third possibility is that labor market discrimination is a cause of sex differences in school content. Corcoran and Courant (1985, 1989) and Daymont and Andrisani (1984), for instance, suggest that the payoffs to investments in training for traditionally "male" fields may be higher for men than women. For college graduates, college major appears to explain much of the difference in starting salaries, because there are tiny male-female differences within major but sizeable differences in average salaries due to women being concentrated in less math-related majors (Paglin and Rufolo, 1990). But coursework differences could also explain very little of the wage gap in broader samples, if differences in kinds of courses taken have only modest effects on wages of those with less schooling or more experience than those Paglin and Rufolo studied.

The three scenarios sketched out differ in their implications for policies aimed at equalizing men's and women's wages. Suppose "male" courses and fields have higher wage payoffs than do "female" courses and fields. If this occurs because men tend to take courses and fields that provide more valuable human capital than those that women with equal ability take, steering women toward "male" fields will equalize wages. But if sex differences in talent and preferences, not differences in school content, account for the higher pay in "male" fields, steering women into such courses will have little effect on the wage gap. Similarly, if women stay out of "male" fields because the labor market rewards men more than women for these courses, equalizing the distribution of majors will do little to equalize men's and women's wages. In this paper we ask two questions: Do sex differences in the content of formal schooling, particularly high school courses and college majors, explain much of the sex-based wage gap? Do men and women receive similar rewards for completing "typically male" courses of study?

We use data from the Survey of Income and Program Participation (SIPP) and the National Longitudinal Study of the High School Class of 1972 (NLS72)—described in Section I--to estimate the extent to which high school courses and college majors are related to wages for prime age adults. We estimate wage equations separately by sex and education level and use this information to calculate how much of the sex-based wage gap can be traced to differences in the content of formal educational training boys and girls acquire over time (Section II). Our results differ from earlier analyses using these data (McNeil, Lamas, and Haber , 1987 (SIPP) and Daymont and Andrisani, 1984 (NLS72)) both in our general approach (we emphasize comparisons of different specifications and standard errors for commonly calculated decompositions) and in our substantive findings (we find differences in college major have larger effects on later earnings).[2] Inevitably, our estimates of the effect of school content also reflect the effects of unmeasured ability, motivation, and background that are correlated with courses that students take, and so are best interpreted as the joint effects of these courses and personal characteristics (Altonji, 1995). With the NLS72 data we can control for scores on tests while in high school, and so control for at least some of these otherwise-omitted factors. In Section III, we analyze of the impact of differences in returns to particular kinds of human capital on the male/female wage gap. Having looked at the overall ability of various specifications to account for the male-female wage difference, we discuss the underlying regressions briefly in section IV, and the implications of our findings in the final section of the paper.

I. Data

In this paper, we use data collected by the SIPP between May and August, 1984 (the "third wave" of the 1984 panel), and the NLS72 through the 1986 (most recent) followup. We chose these particular datasets because they include two sets of earnings determinants--detailed work experience, and courses taken in high school and major field of study thereafter--which are likely to be important in understanding male-female wage differences. While measures of actual experience (time worked, as opposed to an estimate based on age and years of schooling) are available in a few other datasets (e.g., the Panel Study of Income Dynamics), information on courses taken in school for individuals well into their careers is much less common.

SIPP and NLS72 have competing advantages for analyzing male-female wage differentials. SIPP includes workers of all ages (we focus on those 22-63 in our analysis), and a larger sample size, which is helpful for estimating earnings of women in "male majors" and vice versa. Data on courses taken in high school, and major field in college are all survey reports, and field of study data are collected only for those who obtain a degree beyond high school. NLS72 in contrast has a restricted age range (since all respondents are high school seniors in 1972, they are all in their early 30's when resurveyed in 1986). Data on courses taken in high school are from high school transcripts and are therefore more detailed and presumably more reliable. Main field of study is collected for all of those who continue in school beyond high school (so that separate analysis of those with some college is feasible). Another advantage of NLS72 is test-score data, from a short test administered when respondents were high school seniors, as well as college-admission test (SAT and ACT) scores for those who went on to take such tests. One reason coursework differences might be associated with earnings is that more able students take more challenging courses, so that courses taken and college major might be correlated with ability. The test score data provide one way of controlling for ability.

For analyzing the SIPP data, we divide the sample into three groups: did not graduate from high school, high school graduates (including those with some college) and college graduates. We emphasize those with at least a high school degree, for whom we have data on coursework. We divide the NLS72 sample into high school graduates, those with some college, and college graduates. Sample statistics are presented in Tables 1 (SIPP) and 2 (NLS72).[3]

Our SIPP wage variable is the logarithm of the hourly wage, defined as total earnings in the 4-month reference period preceding the survey divided by total hours worked in this period. The difference between men's and women's mean ln-wage is large (.36 or .37) in each education group. Our NLS72 wage variable is the logarithm of earnings per hour in 1986. The ln-wage gap is again .36 for high school graduates, but smaller (.23 and .21) for those with some college or a college degree in this younger cohort. The difference between SIPP and NLS72 is due to the broader SIPP age range rather than other differences between the surveys: for college graduates, and for high school graduates (including those with some college) the male-female difference in ln(wage) is the same for SIPP respondents age 25-34 as it is for those in our NLS72 sample. In order to explain why men and women have unequal wages, we rely on five sets of variables.

The first set of explanatory variables consists of "demographic" variables: location, race/ethnicity, marital status, number of children, and disability. Means of these variables contain few surprises.

Our second set of explanatory variables summarizes work experience. SIPP experience measures include the number of years in which the individual worked 6 months or more, whether that experience was part- or full-time, years with current employer, time out of work (years since age 21 in which the respondent worked less than 6 months), number of interruptions, dummy variables for employer provided training, veteran status, and whether currently working part time. By and large, these reflect expected patterns--women are less likely to have worked full time, more likely to have worked (or be working) part time, have less tenure, and are more likely to have labor force interruptions.

In our NLS72 data, experience is measured by years worked, cumulated from work experience reports in the follow-up surveys. There is no separate identification of part-time experience, though cumulating annual reports of actual weeks is presumably more accurate than the SIPP variable based on retrospective reports that count years rather than weeks. We do not include separate measures of periods out of the labor force, since weeks employed plus weeks not employed would be nearly constant for all observations in a schooling group. Non-school training is reported by length of training, and whether respondent had completed it. Male-female differences in work experience and tenure are much smaller for the NLS72 cohort than for the broader age range in SIPP (or in PSID data used by Corcoran and Duncan (1979)) and are tiny for (employed) college graduates.[4]

The third set of explanatory variables pertains to education. SIPP data show women are less likely to have had geometry or trigonometry and chemistry or physics, but more likely to have had two or more years of foreign language or business courses. Women who graduate from college are more likely to have concentrated in education, liberal arts, and social sciences (excluding economics), and less likely to have their highest degrees in business and engineering; they are also less likely to have Ph.D.s or professional degrees.

The more detailed NLS72 measures of high school coursework show much the same patterns: women take about half a semester less math or science, and more foreign languages and commercial courses.[5] Scores on verbal and math achievement tests taken in high school differ in the expected directions (women with higher verbal scores, men with higher math scores) though the largest such difference (math scores for those who go on to graduate from college) is only .3 standard deviations. For those with some college, women are more likely to have office/clerical and health concentrations, and less likely to have been in engineering and "mechanical and engineering technology" (which includes courses for auto mechanics and machinists as well as drafting and electronics). For college graduates, NLS72 groups economics with other social sciences, but patterns by field are otherwise similar to SIPP.

Previous studies have differed in their decision to include characteristics of the worker's employer--union status, employer size, and industry. To some extent, these variables may indirectly reflect otherwise-unmeasured dimensions of ability or labor-force commitment. On the other hand, they also capture differences in the willingness of employers to hire equally-qualified men and women. While we emphasize results which do not control for these variables, we include them in some specifications, in order to see how much of the advantages of experience or particular types of schooling are due to their providing better access to jobs in high-wage industries or large firms. As Tables 1 and 2 show, historical patterns of employment by industry remain: men are more likely to work in construction, durable manufacturing, and transportation and public utilities, while women are more likely to work in nondurable manufacturing, retail trade and finance-insurance-real estate (for high school graduates), and professional services (college graduates). Women are more likely to work for large companies and less likely to be union (though the latter pattern is reversed among college graduates).

Our final explanatory variable is the proportion of the respondent's 3-digit occupation which is female.[6] It is of course higher for women than for men, and the difference is less pronounced among college graduates.

II. Accounting for the Wage Gap

There are several ways of estimating the proportion of the ln-wage gap between men and women which can be explained by differences in market-related characteristics, based on a standard wage equation. For any variable or variables X, the wage gap which is "due to" X is defined as $(\bar{X}_M - \bar{X}_F)b$, where b is the coefficient or coefficients corresponding to X.

One key decision is whether to use regression coefficients b which reflect the effects of X on wages for males, for females, or for the pooled sample of males and females. Using coefficients from male-only or female-only samples has the disadvantage that standard errors for sex-atypical majors are often high—there are too few males who major in home economics to estimate the effect of being a home-economics major from a male-only sample—and the imprecisely estimated coefficients are then multiplied by large differences in proportions of men and women choosing this major. We therefore emphasize the results using the pooled sample, but include the alternative estimates based on male or female regression coefficients in the appendix for comparison. Indeed, in the next section we present a somewhat non-traditional approach to thinking about differences between male and female wage equations.

The other key specification issue is which explanatory variables to include. We include a set of demographic variables, detailed work experience measures and years of education in all specifications; we present results with and without more detailed controls for high school courses and college major (and, for NLS72, test scores), and with and without controls for employer characteristics and proportion of occupation female. In Table 3 and 4, each row corresponds to a different set of explanatory variables, as indicated in the column "Line".[7] Comparison between rows thus allows us to determine the empirical importance of more detailed measures of education and of including or excluding employer characteristics.

For each group of variables, Tables 3 and 4 show the earnings differential "due to" that group of variables, using coefficients from the pooled regression (which included both male and female observations, and added a dummy variable for one sex)--i.e., $(\bar{X}_M-\bar{X}_F)b_P$. Standard errors that take account of sampling error in the coefficients i.e., $(\bar{X}_M-\bar{X}_F)'V(\bar{X}_M-\bar{X}_F)$, where V is the relevant block of the variance-covariance matrix of the regression coefficients, are also presented.

SIPP

Because we do not have detailed education variables for those who do not graduate from high school, we present these results briefly, and for comparison with more educated groups. In line 1, which includes controls for demographic variables, work history, and years of schooling, we can account for a ln-wage difference of .12-.14, with virtually all of this coming from the work experience variables. This amounts to a 35 to 40 percent reduction in wage gap "due to" work history effects and is consistent with results from other national samples. (See, for example, Corcoran and Duncan, 1979, and Corcoran, Duncan, and Ponza, 1984).[8] Controlling for employer characteristics and proportion female in occupation (line 1') allows one to account for another third or so of the overall gap, but differences in experience remain important.

Results for those who graduate from high school but not college are quite similar (compare line 1 or 1' for the two schooling groups).[9] Adding high school courses in the high-school graduate sample makes no difference (line 2 vs line 1 or 2' vs. 1'). It turns out that the market rewards both elective math and science courses (which men take more often) and foreign language courses (in which women have an edge), and these two differences roughly cancel. The results in line 2' are similar to McNeil and Lamas (1987) and McNeil et al. (1987).[10]

For college graduates, the variables we have do a somewhat better job of accounting for the male-female earnings differential. Demographic characteristics, years of schooling, and (by far, the most important) detailed work experience account a ln-wage differential of .17--roughly half the sex-based wage gap among college graduates. Extra detail on schooling—courses taken in high school, college major, and dummies distinguishing post-BA degree—raise the "explained" differential to .23 (line 2), nearly two thirds of the wage gap. Moreover, once school content variables are included, adding employer variables and percent female add relatively little to the explained differential: much of the differential "due to" these factors comes from a smaller differential attributed to education and work experience differences (compare lines 2 and 2').[11]

These results suggest that sex-based differences in college major account for about 20 percent of the male-female wage gap among employed college graduates, controlling for demographic characteristics and work experience. Controlling for employer variables and percent female in occupation (line 2') reduces this to 12 percent. (The latter finding is consistent with McNeil and Lamas's (1987) and McNeil et al.'s (1987) analyses, which combine major fields into seven groups.)[12] Thus, about half of the effect of college major on earnings is due to the kinds of jobs male and female college graduates take.

<u>NLS72</u>

In Table 4 we present the ln-wage differences accounted for by various groups of variables in the NLS72 data. Here our three education groups are high school graduates, those with some college, and those with (at least) a college degree.

In the first line of each set we present differentials attributable to demographic variables, work experience, and years of schooling, a specification quite close to the analogous SIPP line 1 results.[13] For our first schooling group—those with a high school degree but no college—there is no variation in years of schooling. Differences in work experience again explain a significant fraction of the wage differential, though the differential due to work experience differences is smaller (.08) because the differences in work experience variables are much smaller in younger cohorts.

Adding high school courses to this specification (line 2) accounts for a modest (.034) difference in ln-wages. The slightly stronger results here than in Table 3 are probably due to the better measurement of high school courses in NLS72. Adjusting for scores on the math and verbal tests administered by NLS (line 3) has no further effect on the wage gap, because sex differences in test scores are small and because these scores had small (and usually insignificant) effects on hourly earnings.

Together, differences these differences in experience and schooling account for one third (.12/.36) of the observed difference in ln-wages. If one controls for industry and proportion female in occupation as well, the full set of variables account for a .20 difference, with (again) high school courses and test scores only a small part of the story.

The wage differential for those with some college is smaller than for high school graduates. Differences in work experience account for .068 of this wage difference (line 1), and differences in demographic variables and years of schooling virtually none of it. Adding high school courses and field of highest degree (line 2) raises the explained differential by only .014, though this is not significantly different (statistically) from the .034 for high school graduates.[14] Again, adding high school test score differences contributes nothing to the explained wage differential. Adding industry and proportion female in occupation more than doubles the "explained" differential (to .153) with most of this increase coming from the proportion female measure (line 3' vs line 3).

The ln-wage gap is also smaller for NLS72 college graduates than for high school graduates (.20 vs. .36). Adjusting for sex differences in demographic measures, work experience, and years of schooling accounts for only .040 of this differential. These effects are small because employed men and women with BAs look very similar (in this cohort) in terms of demographic characteristics, work experience, and years of schooling.

Adding detail on highest degree and field of highest degree raises the "explained" differential to .115, more than half of the wage gap, with the augmented set of education variables responsible for .094 of this.[15] Adding high school test scores does not reduce the wage gap any further, nor does it reduce the contribution of major field and degrees.

For those who go on to college, entry-test scores arguably provide a better measure of academic skills learned in high school than do the NLS72 tests. We therefore experimented with adding SAT scores to the model for college graduates, restricting the sample to the 1207 graduates for whom these scores were available. Verbal test scores were significantly related to wages, but scores on the quantitative test had small and statistically insignificant effects. While these results suggest a somewhat larger role for test scores—more in line with the literature[16]—the fact that it is verbal scores that prove important once again means that test score differences do not get us very far in understanding the male-female wage gap.

The lack of impact of these alternative test scores has several implications. We noted in the introduction that the coefficients of courses taken in high school and college reflect the effect of differences in the ability and motivation of students who take these courses in addition to the effect of the courses per se. Our concerns on this score are reduced, though not eliminated, by the robustness of the estimated coursework effects as better controls for ability are added. More narrowly, the NLS results suggest that our earlier SIPP results were not seriously biased by the lack of test score data for SIPP respondents.

When we also include the industry dummies and proportion female in occupation, the total "explained" differential increases to .147, and the differential due to the full set of education variables falls from .094 to .059 (line 3' vs 3.) Thus, about a third of the effect of college major and highest degree on the wage gap occurs because highest degree and college major affect the industries and occupations in which men and women work.

Taken as a whole, the NLS72 results are quite consistent with the SIPP results. College major "matters" for the sex-based wage gap between college graduates in both SIPP and NLS72. Better measures of high school courses modestly increase the importance of differences in such courses for high school graduates. Field of major detail for those with some college, and high school test scores for all education groups make relatively little difference. The impact of differences in work experience are consistently smaller in NLS72 than in SIPP; as Tables 1-2 show, differences in work experience are smaller—especially for college graduates—and that is reflected in Tables 3 and 4.

III. Differences in Coefficients: A New Summary Measure

In the previous discussion we emphasized wage decomposition results based on the pooled-sample regression coefficients. But the appendix tables show that our results would differ somewhat if we had used male or female coefficients instead. Some analysts have claimed that sex differences in returns to human capital may be as important as are sex differences in the stock of human capital in explaining the wage gap, though they differ over whether sex differences in returns reflect discrimination or less intensive investment by women. Corcoran and Courant (1989) for instance argue that if college students see that men are rewarded more in the labor market for typically "male" skills than are women, then women students have fewer incentives than men students to elect typically "male" majors. Mincer and Polachek (1978) on the other hand have argued that women have a lower return to work experience than do men and that this difference occurs because women choose to invest less in on-the-job training than do men.

Both perspectives suggest it would be useful to estimate what fraction of the earnings differential can be attributed to differences in the returns to experience or coursework for men and women. This would be measured by $\bar{X}(b_M-b_F)$, where $\bar{X}$ could refer to male, female, or pooled-sample means. While the wage gap "explained" by differences in <u>all</u> of the coefficients including the intercept is well-defined, the gap explained by differences in a subset of coefficients changes is not, because it depends on how we choose to measure the variables (Jones, 1983).

This is most striking for dummy variables: the differential due to different coefficients of a dummy variable (or set of dummies) depends on the omitted category--and for a single dummy, changing the omitted category changes the sign of the "explained" difference.[17] The wage gap due to differences in particular coefficients is equally sensitive to arbitrary measurement decisions for continuous variables--the only difference is that our conventions for measuring such variables tend to be somewhat stronger. If returns to years of schooling differ, the group that receives lower returns also faces a smaller penalty for not continuing schooling--so measuring schooling by "years short of PhD" rather than years completed would reverse the sign of our estimate of the contribution of such differences to the overall wage gap.

Fortunately, there is a different way of looking at differences in coefficients which is not subject to this criticism. Define

$$\Delta_M = (\bar{X}_M - \bar{X}_F) b_M$$

$$\Delta_F = (\bar{X}_M - \bar{X}_F) b_F$$

$$\Delta = \Delta_M - \Delta_F.$$

Δ_M is what we called the differential due to differences in X using the male coefficients; it is also the change in earnings women would experience if their mean of X became equal to men's, and the incremental X was valued at "male prices" b_M. Similarly, Δ_F tells what their change in earnings would be if their change in X was valued at "female prices" b_F. Δ then answers the question: How much does the change in earnings experienced by women from equalizing X depend on which prices one uses? If Δ equals, say, .05, it means that women would have a larger incentive to equalize means of X if they faced male prices than female prices, and that difference is 5 percentage points of base wages.

Δ is invariant to how one measures the X's—changing the omitted (reference) category for a set of dummy variables like college major will not change Δ_M or Δ_F and therefore won't change Δ. It will be small when either the difference in coefficients or the difference in means is small; it will be zero even when the male and female coefficients are very different if men and women have equal mean values for the variable in question. If we compute Δ for a set of dummy variables, we are weighting the difference in coefficients by the difference in means, as one would in computing the covariance between $(\bar{X}_M-\bar{X}_F)$ and (b_M-b_F). Thus, Δ is a useful statistic for thinking about whether differences in prices may be generating important differences in means—and that is surely an interesting part of the "different coefficients" issue. It is important to emphasize, however, that Δ (= $(\bar{X}_M-\bar{X}_F)(b_M-b_F)$) is not measuring the same thing that $(\bar{X}_M-\bar{X}_F)b_M$ or $(\bar{X}_M-\bar{X}_F)b_F$ would measure; and Δ calculated over all variable groups does not sum to the wage differential not explained by sex differences in $\bar{X}$

The value of Δ for a particular set of variables is just the difference between Δ_M and Δ_F for that set of variables (see appendix tables). Because b_M and b_F are estimated from different samples, the standard error of Δ is $\sigma(\Delta)=[\sigma^2(\Delta_M)+\sigma^2(\Delta_F)]^{.5}$ When the standard error for Δ_M or Δ_F is large (as we noted in explaining our preference for Δ_P in Section II) $\sigma(\Delta)$ will be large, too.

Values of Δ are presented in Table 5, for each of our three SIPP and NLS72 samples. We focus on our preferred specifications (with complete sets of education variables but without employer variables or proportion female in occupation). In both SIPP and NLS72, the Δs are usually smaller than .02 and rarely as large as .05. In the SIPP data, Δ equals .037 (.042) for work experience among college graduates and .047 (.022) for the college graduates' education variables. In the NLS72 data, Δ equals -.050 (.019) for high school graduates' work experience and -.038 (.036) for the college graduate sample's education variables. Thus, for the demographic variables, experience, and education there is little pattern to the Δs, both across schooling groups for one data set, and particularly across data sets for roughly comparable schooling groups. Moreover, standard errors are large: differences as large as .02 begin to be practically important if we have confidence in the estimates, yet only two of the Δs that are this large are statistically significant. We conclude there is little evidence that rewards to women from equalizing experience or education variables depend in any consistent way on whether one uses male or female prices.

The values of Δ in Table 5 have another useful interpretation. Other studies often report the wage differential due to differences in X, using both the male and female coefficients--the Δ_M and Δ_F that we report in the appendix tables--with little attention to whether these differences could be due to chance alone. Because $\Delta = \Delta_M - \Delta_F$, the values of Δ and their standard errors in Table 5 give some evidence on this subject. As the work experience Δ for SIPP college graduates and the education Δ for NLS graduates demonstrate, even fairly large differences may be due to chance alone in samples of this size. To some extent, this is because the effects of sex-typed majors are usually estimated imprecisely for the group that has few graduates with this major. But it also reflects a more general tendency: Δ is often smaller in absolute value than either Δ_M or Δ_F, and its standard error for Δ is always larger.

Turning to the specification which includes employer variables and sex composition of occupation, we find that the Δs for proportion female in occupation are negative (for those with who have at least graduated from high school) in both data sets, significantly so in SIPP. Thus, the penalty for being in female occupations is higher for women than it is for men. This result comes as a surprise. McNeill and Lamas (1987) found this in their analysis of SIPP data, but this finding is at odds with much previous research. Groneau (1988) finds that training requirements of the individual's job (which differ substantially between men and women) have similar effects on men's and women's wages. Treiman and Hartmann (1981) report that an analysis of aggregate data shows that the wage penalty associated with proportion female in occupations is larger for men than for women. Johnson and Solon (1986) and Blau and Beller (1988), in analyses of 1978 and 1981 CPS data respectively, also find that the penalty for being in female occupations is larger for men than women. Sorenson (1990) finds that the wage penalty for being in a female occupation is larger for men than women when she uses the 1983 CPS data, but is roughly the same for men and women using 1984 PSID data. In contrast, our negative Δ says that, if women faced male penalties for landing in largely female occupations, their gain from moving to a "male" occupation distribution would be smaller than it is with female penalties.[18]

IV. Wage Functions by Sex and Education

In Tables 3 and 4, we presented summary tabulations based on a variety of wage equations. Here we briefly describe the results for work experience, schooling, and school content variables in our "preferred" specification, which includes the fullest set of educational and work experience measures, but does not control for employer characteristics (industry, size, unionization) or the proportion female in the occupation. Table 6 presents such equations for each of our six education-by-sex subgroups using SIPP data and Table 7 does the same for our NLS72 data.

In our SIPP regressions we have included linear and quadratic terms for the various measures of work experience and time out of the labor force, as is conventional. However, our interest is whether, "on average", the effects of these variables differ for men and women. To make this comparison more readily, we have re-scaled these variables. Let X be, for example, years of full-time work experience. Then instead of

$$\ln(\text{wage}) = a_0 + a_1 X + a_2 X^2 + \ldots..$$

we estimated

$$\ln \text{wage} = b_0 + b_1 (X-\bar{X}) + b_2 (X-\bar{X})^2 + \ldots$$

The derivative of ln wage with respect to X, evaluated at $\bar{X}$ is then b_1. In short, the rescaling saves one the trouble of "worrying about the quadratic term" in evaluating derivatives, given that we want to evaluate them at mean values of X. We use education- but not sex-specific means of X, so that b_1 has the interpretation of the impact of X on ln (wage), evaluated at the mean level of

X for that education group. We employed this rescaling for years of tenure, full-time work experience, part-time work experience, and years out of the labor force. In our NLS regressions, however, we found that the fact that all of our respondents were all nearly the same age and so had nearly identical levels of potential experience in each schooling group meant that, in practice, quadratic terms contributed very little. So our NLS regressions simply include only linear terms.

Comparisons between SIPP and NLS72 experience effects is complicated by the difference in available experience measures. In SIPP, full time experience is rewarded more for men than women. In NLS72, experience coefficients are larger for women, though not very precisely estimated (given the restricted age range and fewer interruptions) for either sex. Years of tenure with employer earn quite similar returns for men and women in both data sets.

Wage differences related to differences in courses taken in high school are somewhat stronger for those who do not go to college, and both "male" math (and, in SIPP, science) courses and "female" foreign language courses receive modest rewards. The NLS72 coefficients are slightly larger when test scores are not held constant, but the effects of the test scores are small enough that they do not substantially change any of the patterns. If one makes allowance for the fact that SIPP variables are dummy variables for particular levels, while NLS72 measures semesters taken in each categories, the NLS72 coefficients tend to be a bit larger (for those courses the market rewards at all), as might be expected given that the NLS72 measures are probably more accurate.

College majors are important determinants of earnings for those who obtain a BA, but not for those who leave college before that. Indeed, in the NLS72 data we cannot reject the hypothesis that, as a group, the field dummies have no effect on wages for men and women in the some college group. Note that the largest coefficients are those for sex-atypical choices--men in clerical/office programs and women in mechanical engineering technology. Sample sizes for these cells are 3 and 5, respectively. While the coefficients are "significant", we could not rule-out near-zero values.

The college-major variables take business majors (the most popular reported major for men, and second most common (after education) for women) as the reference (omitted) major. For men, while the individual coefficients are not as precisely estimated as we would like, the general pattern confirms one's expectations. Business majors are relatively well paid (so nearly all the coefficients, which reflect differences between that major and business, are negative). Engineering and computer science are lucrative; education, English and liberal arts, and social sciences (psychology and other social sciences, but excluding economics in SIPP where it is separately identified) majors prepare one for relatively low-wage work.

For women, patterns among the most popular majors are broadly similar. We were particularly interested in how male-female rewards for math and science majors might differ. Overall it appears that the wage premium for majoring in engineering or computer science rather than business is larger for women than men, but there is no similar pattern across the other math/science majors.

Just as we (and previous researchers) have calculated the proportion of workers in each occupation who are female, we can construct a similar measure to summarize femaleness of degree field for those with college degrees. More precisely, we calculated the proportion of those in each degree level (BA, MA, PhD, professional) by field cell who were female. When we replaced the dummy variables for field of highest degree in Table 3 with this "proportion female in field" variable, its coefficient was -.401 (.051) for men and -.002 (.053) for women in SIPP. In NLS, the results were similar: -.537 (.075) and -.190 (.069). Thus, men in majors with high fractions female earned considerably less than those in nearly-all-male majors, but femaleness of major matters less for women in NLS72,[19] and not at all for women in SIPP.[20]

V. Conclusions

We began this paper with two questions: Do sex differences in the content of formal schooling, particularly high school courses and college majors, account for much of the sex-based wage gap? Are women rewarded less than men for acquiring typically "male" skills?

We find that male/female differences in high school courses have little effect on the wage gap, mainly because the courses typically elected by girls are just as wage-enhancing as those typically elected by boys, and that differences in test scores in high school also account for little of the wage gap. For those who do not graduate from high school and for high school graduates, differences in demographic variables, education, and detailed work experience account for roughly one third of the .36 ln-wage gap in both SIPP and NLS72 data sets, and the experience and training variables are primarily responsible. Similarly, differences in work experience account for about a third of the .24 ln-wage gap between men and women with some college (but less than a BA) in the NLS72 data.

For college graduates, both the ln-wage gap and male-female differences in labor market experience are large in the all-age SIPP sample but are smaller in the relatively younger NLS72 group. After controlling for demographic and work experience variables, there is a remaining ln-wage gap of .18-.20 in our two samples. Differences in college majors <u>are</u> strongly related to the wage gap, both in SIPP (where we cannot control for high school test scores) and NLS72 (where we can), accounting for .08-.09 of this .20. Not surprisingly, one reason why differences in college major explain the wage gap is that college major affects the kind of occupations and industries college graduates work in. Controlling for job characteristics accounts for about one third to one half of the effects of college major on the male-female wage gap for college graduates.

We rephrase the question "are women rewarded less than men for acquiring typically 'male' skills" as "would women gain more from such equalization of school courses and later experience if they received male rather than female prices?" We find little consistent evidence that they would, particularly those who do not graduate from college. For college graduates, there is some evidence that the penalty associated with a female major is on average larger for men than women; alternatively stated, women earn a smaller premium for completing a "male" major than men do.

These analyses demonstrate that sex-based differences in college majors "account for" a sizeable proportion of the wage gap among college graduates, but do not tell us why this is so. It could be, of course, that certain majors provide training and skills that enhance students' productivity as workers. If this were the case, encouraging women college students to enroll in "profitable" majors would be one way to reduce the male-female wage gap. On the other hand, students' choices of college majors may reflect their underlying abilities and preferences, and the observed association between college major and the male-female wage gap may be picking up differences in men's and women's abilities and tastes, not differences in training. To the extent this is true, programs designed to bring women into "profitable" majors may do little to affect the sex-based wage gap. The fact that the importance of field of degree is not reduced by controlling for available test scores makes us guardedly optimistic that equalizing college majors would help reduce the wage male-female wage gap.

NOTES

1. Traditionally, men have been less likely to graduate from high school but more likely to graduate from college. These differences have recently gotten smaller. Women are now as likely as men to receive a BA or a Master's degree, and male/female differences in receipt of Ph.D. or professional degree have substantially decreased (Marini, 1989, p. 353).

2. For SIPP, the most important reason for this difference is that we emphasize specifications that do not hold constant the fraction female in the worker's occupation, as did McNeil, Lamas, and Haber (1987). For NLS72, we use 1986 wages (roughly ten years after college graduation), while Daymont and Andresani (1984) analyzed 1979 data and report much smaller overall wage differences by sex.

3. We use unweighted data throughout. The 1984 SIPP panel is "designed to be a self-weighting probability sample [in which] every sample unit has the same overall probability of selection" (Kasprzyk, Doyle, Goldstein, and McMillen, 1987, p. 5-10). NLS72 began (in the first wave) as a stratified sample with those in schools in low-income areas or high proportions of minority enrollment over-sampled. The 1986 follow-up oversampled Hispanics, those with a four-year college (or higher) degree, teachers and "potential teachers" (the latter included those "who had some background in the sciences, math, or engineering"), those who were married, widowed or divorced, and never-married parents. The net effect of this complicated sampling scheme and survey non-response is surprisingly small--non-white groups are slightly over-represented (18 percent of all follow-up respondents, compared to 14 percent weighted), but weighted and unweighted distributions by tenure with employer, marital status, sex, and parents' socio-economic status are nearly identical. See Tourangeau et al, 1987.

4. The NLS-72 tenure differences by sex are very similar to those of comparably-educated SIPP respondents age 25-34.

5. Differences in industrial arts are much sharper in NLS72, probably because SIPP counts home economics as industrial arts.

6. We used U.S. Bureau of Labor Statistics (January 1985, Table 22) tabulations of 1984 Current Population Survey data. For occupations too small to be reported there, we turned to 1980 Census data (U.S. Census Bureau, 1984, Table 1).

7. For those who did not graduate from high school, detailed educational variables are unavailable, so there are only two specifications presented for this group.

8. Here and in the other SIPP samples, alternative ways of handling work experience (breaking it into segments as in Mincer and Polachek (1974, 1978) or interacting training with experience and tenure) to capture differences in human capital accumulation per year on the job make no substantive difference.

9. Using the male coefficients allows us to account for more of the wage gap for those who did not graduate from high school, and less for those who did graduate, due primarily to differences in the estimated impact of proportion female.

10. The high school course variable in these two studies is the number of math, science, and foreign language courses combined, which (as Table 1 suggests) differs little between men and women.

11. Once again, the college-graduate results were not sensitive to the details of the way work experience variables were handled.

12. These two studies used only male coefficients to weight differences in means of the independent variables (this turns out to make relatively little difference--see Appendix Table 1), and did not report comparable estimates when employer variables and proportion female were not held constant.

13. Apart from the more detailed training measures and inability to distinguish part-time from full-time work experience, the main differences are that we do not include quadratic experience terms in our NLS72 analyses because there is little age-related variation in these variables (in preliminary work quadratic terms made little difference). We also do not control for currently working part time, because this variable was consistently wrong-signed (positive) where it mattered at all, as might be expected if hours worked (the denominator of the dependent variable) is measured with enough error.

14. The point estimates are larger if one uses either the male or the female coefficients, but the standard errors are very large (see appendix). This reflects the problem of estimating such coefficients from one-sex samples noted above. Impacts of differences in majors based on male and female coefficients are sensitive to coefficients on majors with fewer than six people (of one sex) in the major.

15. Daymont and Andrisani (1984) in their analyses of NLS72 college graduates' earnings three years after graduation reported that field of highest degree accounted for .045 to .058 of a .129 wage gap.

16. Most previous studies combine verbal and quantitative scores where both are available, and some find statistically significant effects on later earnings. E.g., O'Neill (1990) finds that scores on the Armed Forces Qualifying test (administered to National Longitudinal Study respondents) had significant positive effects on earnings of young men 22-28. Neal and Johnson (1995) report a similar result for young men and young women 26-29. Murnane, Willett, and Levy (1995) find math scores matter more than verbal scores in determining wages of NLS72 respondents six years after high school. None of these studies controls for high school coursework or college major.

17. Suppose b_M and b_F are the coefficient for a dummy variable X that equals one for workers covered by a union contract and zero otherwise, and P is the proportion unionized. Suppose instead we define X'=1-X, a dummy for non-union workers. It's easy to show that $b_M'=-b_M$, $b_F'=-$

b_F, and $P'=(1-P)$. So the differential due to sex differences in the union premium is $(b_M-b_F)P$ but the differential due to sex differences in the "penalty" for being non-union is $-(b_M-b_F)(1-P)$.

18. Δ remains negative when we do not control for coursework or test scores, so these variables (which are not held constant in the other studies) can not account for differences between our results and theirs.

19. In Table 5, Δ for education is negative (as is the part of Δ due to major alone) in the NLS72 college graduates sample, which suggests that femaleness of major has a more negative effect on women's wages than on men's, though the difference is not statistically significant. The negative sign for Δ is due primarily to industrial arts courses in high school, and engineering majors in college, having much larger positive coefficients for women than men (see Table 7). Neither of these is statistically significant, and in fact there are only three female engineering majors in the data. But these coefficients are then weighted by very large $\bar{X}_M-\bar{X}_F$. In contrast, when proportion female in major is entered as a regressor, the three female engineering majors have very small influence on the coefficient. We do not, however, emphasize the regressions with "proportion female in field" as an explanatory variable, in part because for both men and women in both SIPP and NLS72 the full set of major dummies fit the data a bit better than did our constructed "proportion female in field" variable.

20. When we replaced degree-field dummies with proportion female in field in equations which included proportion female in occupation as a control variable (along with the other "job" variables--unionization, employer size, and industry dummies), the proportion female in degree field coefficient was -.201 (.054) for men and +.100 (.053) for women. In our NLS72 sample, controlling for industry and proportion female in occupation reduced the female major coefficients to -.381 (.079) for males and -.005 (.072) for females.

References

Altonji, Joseph. "The Effects of High School Curriculum on Education and Labor Market Outcomes," Journal of Human Resources, vol. 30, no. 3, Summer 1995, pp. 409-438.

Benbow, C.P. and Stanley, J.C. "Sex Differences in Mathematical Ability: Fact or Artifact?" Science, vol. 210, 1980, pp. 1262-1264.

Blakemore, Arthur and Low, Stuart. "Sex Differences in Occupational Selection: The Case of College Majors," Review of Economics and Statistics, vol. 66, February 1984, pp. 157-163.

Blau, Francine, and Beller, Andrea. "Trends in Earnings Differentials by Gender, 1971-1981," Industrial and Labor Relations Review, vol. 41, no. 4, April 1988, pp. 513-529.

Blau, Francine and Ferber, Marianne. The Economics of Women, Men, and Work, 2nd Ed. (Englewood Cliffs, NJ: Prentice Hall, 1992).

Blinder, Alan. "Wage Discrimination: Reduced Form and Structural Estimates," Journal of Human Resources, vol. 8, 1973, pp. 436-455.

Card, David and Krueger, Alan. "School Quality and Black/White Relative Earnings: A Direct Assessment," Quarterly Journal of Economics, vol. 107, February 1992.

Corcoran, Mary and Courant, Paul. "Sex-Role Socialization and Labor Market Outcomes," American Economic Review, vol. 75, 1985, pp. 275-278.

Corcoran, Mary and Courant, Paul. "Sex-Role Socialization, Screening by Sex, and Occupational Segregation," working paper, University of Michigan, 1989.

Corcoran, Mary and Duncan, Greg. "Work History, Labor Force Attachment, and Earnings Differences Between the Races and Sexes," Journal of Human Resources, vol. 14, 1979, pp. 3-20.

Corcoran, Mary; Duncan, Greg; and Ponza, Michael. "Work Experience, Job Segregation, and Women's Wages," in B. F. Reskin, ed., Sex Segregation in the Workplace: Trends, Explanations, and Remedies (Washington DC: National Academy Press, 1984), pp. 171-191.

Daymont, Thomas and Andrisani, Paul. "Job Preferences, College Major, and the Gender Gap in Earnings," Journal of Human Resources, vol. 19, 1984, pp. 408-428.

Duncan, Greg et al. Years of Poverty, Years of Plenty (Ann Arbor, MI: Institute for Social Research, 1984).

Duncan, Greg and Corcoran, Mary. "Do Women 'Deserve' to Earn Less than Men?" in G. Duncan et al., Years of Poverty, Years of Plenty (Ann Arbor, MI: Institute for Social Research, 1984), pp. 153-172.

Eccles, Jacqueline. "Sex Differences in Mathematics Participation," in M. Maehr and M. Steinkampf (eds.), Women in Science (Greenwich CT: JAI Press, 1984), pp. 93-137.

Eccles, Jacqueline and Hoffman, Lois. "Sex Differences in Preparation for Occupational Roles," in H. Stevenson and A. Siegel (eds.), Child Development and Social Policy (Chicago: University of Chicago Press, 1984), pp. 367-420.

Fennema, E. and Sherman, J. "Sex-Related Factors: A Further Study," Journal for Research in Mathematics Education, vol. 9, 1979, pp. 189-203.

Fox, L., Tobin, D. and Brady, L. "Sex-role Socialization and Achievement in Mathematics," in M. Wittig and A. Petersen (eds.), Sex-Related Difference in Cognitive Functioning: Developmental Issues (New York: Academic Press, 1979).

Gunderson, Morley. "Male-Female Wage Differentials and Policy Responses," Journal of Economic Literature, vol. 27, no. 1, March 1989, pp. 46-72.

Groneau, Reuben. "Sex-related Differentials and Women's Interrupted Labor Careers--the Chicken or the Egg" Journal of Labor Economics, vol. 6, no. 3, Julu 1988, pp. 277-301.

Jacobs, Jerry A. Revolving Doors: Sex Segregation and Women's Careers (Stanford CA: Stanford University Press, 1989).

Jacobs, Jerry A. "Sex Segregation in American Higher Education," Women and Work, vol. 1,1985, pp. 191-214.

Johnson, George and Solon, Gary. "Estimates of the Direct Effects of Comparable Worth Policy," American Economic Review, vol. 76, December 1986.

Jones, F.L. "On Decomposing the Wage Gap: A Critical Comment on Blinder's Method," Journal of Human Resources, vol. 18, 1983, pp. 126-130.

Kasprzyk, Daniel; Doyle, Pat; Goldstein, Arnold; and McMillen, David. Survey of Income and Program Participation User's Guide (Washington DC: Bureau of the Census, July 1987).

Marini, Margaret. "Sex Differences in Earnings in the United States," in W. R. Scott, ed., Annual Review of Sociology, vol. 15 (Palo Alto CA: Annual Reviews, 1989).

Maxwell, Nan L. "The Effect on Black-White Wage Differences of Differences in the Quantity and Quality of Education," Industrial and Labor Relations Review, vol. 47, no. 2, January1994.

McNeil, Jack and Lamas, Enrique. "Male-Female Differences in Work Experience, Occupation, and Earnings: 1984", Current Population Reports, Series P-70, no. 10, 1987.

McNeil, Jack; Lamas, Enrique; and Haber, Sheldon. "Job Tenure, Lifetime Work Interruptions, and Wage Differentials," SIPP Working Paper No. 8711 (Washington DC: Bureau of the Census, 1987).

Mincer, Jacob. and Polacek, Solomon. "Family Investments in Human Capital: Earnings of Women," Journal of Political Economy, vol. 82, no. 2, part 2, March-April 1974, pp. S76-S110.

Mincer, Jacob. and Polachek, Solomon. "An Exchange: Theory of Human Capital and the Earnings of Women; Women's Earnings Reexamined," Journal of Human Resources, vol. 13, 1978, pp. 118-134.

Murnane, Richard; Willett, John; and Levy, Frank. "The Growing Importance of Cognitive Skills in Wage Determination," Review of Economics and Statistics, vol. 77, no. 2, May 1995, pp. 217-230.

Neal, Derek and Johnson, William. "The Role of Pre-Market Factors in Black-White Wage Differences," NBER Working Paper 5124, May 1995.

Oaxaca, Ronald. "Male-Female Wage Differentials in Urban Labor Markets," International Economic Review, vol. 14, October 1973, pp. 693-709.

Paglin, Morton and Rufolo, Anthony. "Heterogeneous Human Capital, Occupational Choice, and Male-Female Earnings Differences," Journal of Labor Economics, vol. 8, no. 1, January 1990, pp. 123-144.

Polachek, Solomon. "Sex Differences in College Major," Industrial and Labor Relations Review, vol. 33, 1978, pp. 498-508.

Smith, James P. and Welch, Finis. "Black-White Male Earnings Ratios: 1960-1970," American Economic Review, vol. 67, no. 3, June 1977, pp. 323-338.

Smith, James P. and Welch, Finis. Closing the Gap: Forty Years of Economic Progress for Blacks (Santa Monica, CA: The Rand Corporation, 1986).

Sorenson, Elaine. "The Crowding Hypothesis and Comparable Worth," Journal of Human Resources, vol. 25, no. 1, Winter 1990, pp. 55-89.

Tourganeau, Roger, et al., The National Longitudinal Study of the High School Class of 1972 (NLS-72) Fifth Follow-Up Data File Users' Manual (Washington DC: Center for Educational Statistics, December 1987).

Treiman, Donald J. and Hartmann, Heidi I. (eds.). Women, Work, and Wages: Equal Pay for Jobs of Equal Value (Washington, DC: National Academy Press, 1981).

U.S. Bureau of Labor Statistics, Employment and Earnings, monthly.

U.S. Census Bureau. 1980 Census of Population, volume 2, Subject Reports, pt. 7C, Occupation By Industry (Washington DC: U.S. Government Printing Office, May 1984).

U.S. National Center for Education Statistics. Digest of Educational Statistics 1993 (Washington DC: US Government Printing Office, 1993)

Table 1
Means of Variables by Education and Sex: SIPP

Variable	Not HS Grad		HS Grad, Not Coll Grad		College Grad	
	Male	Female	Male	Female	Male	Female
Dependent Variable						
ln (Earnings/Hour)	1.970	1.611	2.177	1.802	2.488	2.121
Demographic Variables						
Metro Area	0.664	0.696	0.748	0.755	0.816	0.798
North East	0.217	0.191	0.221	0.230	0.252	0.246
North Central	0.226	0.238	0.279	0.265	0.230	0.229
West	0.140	0.146	0.193	0.188	0.212	0.195
Black	0.127	0.156	0.089	0.119	0.041	0.075
Hispanic	0.125	0.118	0.043	0.041	0.022	0.019
Asian	0.017	0.028	0.019	0.019	0.040	0.034
Married, Spouse Present	0.779	0.625	0.723	0.626	0.749	0.602
Married, Spouse Absent	0.006	0.008	0.005	0.007	0.003	0.004
Divorced	0.067	0.160	0.073	0.142	0.055	0.086
Separated	0.025	0.068	0.020	0.032	0.008	0.025
Widowed	0.013	0.068	0.006	0.032	0.004	0.018
Number of Own Kids	1.391	1.327	1.276	1.258	1.218	0.971
Number of Kids < 18	0.962	0.880	0.899	0.847	0.928	0.672
Disabled	0.129	0.120	0.065	0.058	0.038	0.036
Experience + OJT						
Yrs.Exper. (Full-time)	22.344	14.053	18.594	11.705	17.237	10.786
Yrs Exper. (Part-Time)	0.447	1.896	0.282	1.995	0.522	1.829
Years Tenure w/Employer	10.617	7.324	9.152	6.431	8.552	6.177
Yrs Out of Labor Force	5.214	12.883	1.495	6.090	0.976	3.033
No. of LF Interrupts	0.218	0.772	0.180	0.679	0.330	0.632
Training 1979 or Before	0.092	0.070	0.147	0.113	0.089	0.054
Training 1980 or Later	0.058	0.080	0.160	0.142	0.169	0.153
Veteran Status	0.341	0.003	0.441	0.016	0.339	0.009
Current Wk is Part-Time	0.069	0.257	0.055	0.253	0.043	0.188
Education						
Yrs School Completed	8.634	8.872	12.786	12.692	16.783	16.711
High School Courses						
Algebra			0.762	0.723	0.970	0.971
Geometry or Trig.			0.498	0.420	0.909	0.860
Chemistry or Physics			0.443	0.350	0.836	0.742
English (≥ 3 years)			0.914	0.940	0.974	0.982
Foreign Lang.(≥ 2 yrs)			0.284	0.408	0.687	0.790
Indus.Arts etc.(≥2 yrs)			0.674	0.618	0.393	0.368
Business (≥ 2 years)			0.266	0.670	0.216	0.352
Field of Highest Degree						
Agricul-Forestry					0.024	0.004
Biology					0.024	0.024
Business					0.246	0.111
Economics					0.028	0.006

(Table 1, Continued)

Variable	Not HS Grad		HS Grad, Not Coll Grad		College Grad	
	Male	Female	Male	Female	Male	Female
Field Highest Deg. (cont.)						
Education					0.112	0.336
Engineer-Computer Sci					0.145	0.019
English					0.026	0.046
Home Economics					0.001	0.018
Law					0.034	0.013
Liberal Arts					0.065	0.098
Math-Statistics					0.025	0.018
Medicine					0.024	0.014
Nursing					0.012	0.091
Physical Science					0.042	0.016
Law Enforcement					0.010	0.005
Psychology					0.024	0.037
Religion					0.025	0.003
Social Science					0.058	0.083
Vocational					0.010	0.001
Other					0.066	0.058
PhD					0.046	0.017
Professional Degree					0.056	0.029
MA					0.231	0.255
Job Variables						
Industry						
Agric Forest Fish	0.037	0.008	0.012	0.005	0.008	0.001
Mining	0.017	0.001	0.015	0.004	0.012	0.005
Construction	0.140	0.004	0.088	0.011	0.023	0.005
Nondur. Manufacturing	0.151	0.212	0.115	0.100	0.067	0.038
Durable Manufacturing	0.240	0.149	0.209	0.092	0.144	0.044
Transp & Pub. Utilities	0.109	0.023	0.133	0.046	0.061	0.037
Wholesale Trade	0.017	0.013	0.035	0.018	0.041	0.008
Retail Trade	0.103	0.198	0.122	0.169	0.064	0.052
Finan.Ins. & Realty	0.023	0.030	0.036	0.109	0.082	0.064
Bus-Repair Service	0.041	0.035	0.045	0.037	0.031	0.047
Personal Service	0.007	0.091	0.012	0.037	0.006	0.008
Entertain.& Recreation	0.011	0.007	0.007	0.007	0.005	0.008
Professional Service	0.049	0.197	0.065	0.294	0.311	0.630
Employer Size						
Establishment 25-99	0.248	0.219	0.236	0.215	0.252	0.330
Establishment 100+	0.382	0.441	0.446	0.431	0.489	0.398
Company 25-99	0.167	0.120	0.132	0.113	0.118	0.119
Company 100-499	0.143	0.192	0.131	0.159	0.155	0.218
Company 500-999	0.038	0.052	0.042	0.049	0.056	0.068
Company 1000+	0.396	0.406	0.509	0.452	0.545	0.435
Union	0.315	0.201	0.311	0.146	0.132	0.203
Percent Female						
Proportion in Occupation	0.174	0.635	0.229	0.688	0.369	0.587
Sample Size	1493	995	5131	4702	2071	1474

Table 2
Means of Variables by Education and Sex: NLS72

Variable	High School Graduates Male	High School Graduates Female	Some College Male	Some College Female	College Graduates Male	College Graduates Female
Dependent Variable						
ln (Earnings/Hour)	2.345	1.985	2.354	2.121	2.554	2.346
Demographic Variables						
Black	0.072	0.102	0.056	0.119	0.033	0.086
Hispanic	0.057	0.062	0.049	0.037	0.019	0.015
Asian	0.007	0.011	0.007	0.007	0.014	0.020
Other	0.065	0.055	0.056	0.044	0.032	0.034
Married	0.696	0.703	0.714	0.644	0.706	0.619
Marriage-like Relationship	0.040	0.037	0.036	0.061	0.022	0.043
Divorced	0.083	0.079	0.066	0.125	0.034	0.053
Separated	0.028	0.056	0.015	0.028	0.019	0.023
Widowed	0.001	0.003	0.003	0.001	0.000	0.002
# of Children	1.240	1.419	1.119	1.184	0.872	0.700
Experience & Training						
Work Experience (years)	11.178	9.576	11.112	9.956	9.992	9.647
Tenure (years)	5.880	4.920	5.243	4.176	4.193	4.006
Training < 1 month	0.202	0.268	0.241	0.272	0.213	0.219
Training 1 mo.-1 year	0.193	0.215	0.271	0.224	0.192	0.199
Training ≥ 1 year	0.147	0.038	0.171	0.076	0.091	0.057
Left Training uncompleted	0.021	0.015	0.037	0.022	0.010	0.012
Still in Training	0.020	0.025	0.040	0.018	0.029	0.014
Education						
# of H.S. Semesters in:						
H.S. Math	3.488	2.855	4.122	3.410	5.225	4.552
H.S. Science	3.400	2.823	3.865	3.289	4.897	4.320
H.S. English	5.895	5.897	6.015	6.016	6.257	6.288
H.S. Foreign Languages	1.173	1.544	1.807	2.212	3.057	3.871
H.S. Social Studies	5.284	5.079	5.372	5.129	5.395	5.302
H.S. Industrial Arts	3.060	0.240	2.318	0.246	1.121	0.127
H.S. Commercial	1.572	4.904	1.604	3.882	1.286	2.161
H.S. Arts	1.371	1.887	1.467	1.940	1.526	2.325
Test Scores						
Vocabulary (15 questions)	5.202	5.407	6.192	6.568	8.920	9.251
Reading (20 questions)	8.132	8.833	9.961	10.233	12.916	13.314
Math (25 questions)	11.722	10.338	14.208	12.854	19.302	17.673
Years of Schooling	12.000	12.000	13.995	13.895	16.576	16.430
Field of Highest Degree						
Agriculture-Forestry			0.025	0.025	0.026	0.021
Biology			0.023	0.013	0.043	0.026
Clerical/Office			0.004	0.129	0.000	0.015
Computer Technology			0.052	0.037	0.024	0.016

Table 2, Continued

Variable	High School Graduates		Some College		College Graduates	
	Male	Female	Male	Female	Male	Female
Field Highest Deg. (cont.)						
Education			0.043	0.064	0.082	0.252
Engineering			0.064	0.010	0.084	0.003
Mechanical Eng. Tech.			0.193	0.007	0.025	0.002
Humanities-Fine Arts			0.044	0.035	0.065	0.099
Health			0.036	0.187	0.014	0.126
Public Service			0.063	0.037	0.031	0.020
Physical Science-Math			0.022	0.007	0.036	0.021
Social Sciences			0.049	0.051	0.104	0.123
Professional			0.011	0.019	0.134	0.071
Other			0.055	0.058	0.051	0.055
No Major			0.143	0.176	0.011	0.017
PhD-Professional					0.118	0.060
Masters					0.222	0.251
Industry						
Agric/Forest/Fish	0.030	0.008	0.019	0.014	0.025	0.003
Mining	0.046	0.001	0.016	0.006	0.016	0.005
Construction	0.133	0.014	0.103	0.017	0.043	0.004
Nondur. Manufacturing	0.094	0.077	0.060	0.050	0.070	0.048
Durable Manufacturing	0.178	0.079	0.174	0.064	0.118	0.038
Transp/Commun/Pub. Util.	0.083	0.073	0.115	0.065	0.055	0.037
Wholesale Trade	0.039	0.022	0.041	0.011	0.023	0.012
Retail Trade	0.125	0.195	0.121	0.097	0.067	0.051
Finance/Insur./Real Estate	0.030	0.104	0.037	0.098	0.091	0.068
Bus. Repair Services	0.056	0.049	0.081	0.043	0.058	0.054
Personal Services	0.018	0.032	0.015	0.039	0.011	0.013
Entertainment & Recreation	0.005	0.004	0.008	0.014	0.010	0.010
Professional Service	0.033	0.202	0.063	0.338	0.269	0.499
Other	0.047	0.062	0.040	0.054	0.058	0.089
Percent Female						
Proportion in Occupation	0.204	0.644	0.229	0.664	0.295	0.562
Sample Size	822	713	730	722	1083	924

Table 3
Male-Female Earnings Differentials Attributable to
Various Sets of Explanatory Variables: SIPP

		Earnings Differential Attributable to					
Education Level	Model	Demographic Variables	Work Experience	Education	Job Variables	% Female in Occupation	Total Explained
<HS Grad [Gap=.359]	1	0.000 (0.004)	0.128 (0.013)	-0.001 (0.001)			.127
	1'	-0.001 (0.004)	0.094 (0.012)	-0.001 (0.001)	0.056 (0.009)	0.076 (0.017)	.224
≥ HS Grad < Coll. Grad	1	0.006 (0.001)	0.130 (0.006)	0.005 (0.000)			.141
[Gap=.375]	1'	0.006 (0.001)	0.094 (0.006)	0.006 (0.000)	0.056 (0.004)	0.063 (0.007)	.226
	2	0.007 (0.001)	0.130 (0.006)	0.006 (0.004)			.143
	2'	0.007 (0.001)	0.095 (0.006)	-0.002 (0.004)	0.058 (0.004)	0.066 (0.008)	.223
≥ Coll. Grad [Gap=.367]	1	0.016 (0.003)	0.150 (0.009)	0.004 (0.001)			.170
	1'	0.014 (0.003)	0.117 (0.009)	0.005 (0.001)	0.054 (0.006)	0.062 (0.008)	.251
	2	0.014 (0.003)	0.143 (0.009)	0.077 (0.009)			.234
	2'	0.012 (0.003)	0.121 (0.009)	0.043 (0.009)	0.045 (0.007)	0.043 (0.008)	.263

Notes:

In models 1 and 1', education is measured by years of schooling; models 2 and 2' include detail on coursework (see below).

Demographic variables = SMSA, region (3), race/ethnicity (3), marital status (5), number of children (2), disabled.

Education = years completed. In lines 2 and 2', high school courses (7), and, for college graduates, prof/grad degree (3) and college major (19) are added.

Work experience = full-time experience, part-time experience, tenure, time out of work, squares of tenure, detailed experience and time out, number of interruptions, training (2), veteran status, and currently working part time.

Employer Variables = industry (13), establishment and firm size (6), union.

Table 4
Male-Female Earnings Differentials Attributable to
Various Sets of Explanatory Variables: NLS72

		Earnings Differential Attributable to					
Education Level	Line	Demographic Variables	Work Experience	Education	Industry Dummies	Proportion Female in Occupation	Total Explained
H.S. Grad [Gap=.360]	1	.002 (.003)	.081* (.009)				.083
	1'	.002 (.003)	.072* (.008)		.028* (.010)	.057* (.019)	.159
	2	.002 (.003)	.084* (.008)	.034* (.015)			.121
	3	.000 (.003)	.084* (.008)	.037* (.016)			.121
	3'	.000 (.003)	.074* (.008)	.029* (.015)	.036* (.010)	.058* (.018)	.197
Some College [Gap=.233]	1	-.003 (.004)	.068* (.007)	.005 (.001)			.070
	1'	-.003 (.004)	.058* (.007)	.005 (.001)	.011 (.011)	.095 (.019)	.166
	2	-.005 (.004)	.067* (.007)	.011 (.018)			.073
	3	-.007 (.004)	.065* (.007)	.013 (.018)			.072
	3'	-.007 (.004)	.056* (.007)	-.006 (.018)	.020 (.012)	.093* (.019)	.156
College Grad [Gap=.207]	1	.011* (.003)	.013* (.002)	.016* (.002)			.042
	1'	.012* (.003)	.011* (.002)	.016* (.002)	.031* (.007)	.053* (.011)	.125
	2	.009* (.003)	.012* (.002)	.094* (.012)			.114
	3	.008* (.003)	.011* (.002)	.094* (.013)			.113
	3'	.009* (.003)	.010* (.002)	.059* (.013)	.029* (.007)	.040* (.011)	.146

Notes:

In models 1 and 1', education is measured by years of schooling; models 2 and 2' include detail on coursework, and models 3 and 3' include test scores (see below).

Demographic variables = Race/ethnicity (4), marital status (5), number of children.

Education = years completed. In line 2, high school courses (8), college major (14) (for those with at least some college) and graduate degree (2) are added. In line (3), high schoo
scores (3) are also included.

Work experience= years of work experience, tenure, training (5).

Employer variables = industry (14)

Table 5
Differences in Coefficients Times Differences in Means

Education Group	Table/ Line	Demographic Variables	Work Experience	Education	Employer Variables	Proportion Female in Occupation
SIPP						
<H.S. Grad	3/1	.016 (.009)	-.006 (.075)	-.007 (.002)		
	3/1'	.014 (.009)	.032 (.072)	-.006 (.002)	.009 (.030)	.041 (.034)
≥H.S. Grad, <Coll. Grad	3/2	.006 (.003)	-.004 (.023)	.018 (.008)		
	3/2'	.007 (.003)	.015 (.022)	.017 (.008)	.008 (.009)	-.062 (.016)
≥College Grad	3/2	.008 (.007)	.037 (.042)	.047 (.022)		
	3/2'	.006 (.006)	.063 (.040)	.047 (.022)	.026 (.014)	-.072 (.016)
NLS 72						
H.S. Grad	4/3	-.001 (.005)	-.050 (.019)	.007 (.050)		
	4/3'	-.001 (.005)	-.042 (.019)	-.005 (.048)	-.036 (.029)	-.064 (.040)
Some College	4/3	.009 (.009)	-.017 (.015)	.013 (.064)		
	4/3'	.007 (.009)	-.021 (.015)	.014 (.062)	.016 (.027)	-.026 (.042)
College Grad	4/3	.012 (.006)	-.005 (.004)	-.038 (.036)		
	4/3'	.011 (.006)	-.005 (.004)	-.019 (.036)	.010 (.015)	-.031 (.023)

Note:

The first number in each pair is $\Sigma\ (b_m-b_f)(X_m-X_f)$, where b_m and b_f are regression coefficient, and X_m and X_f are means, for males and females respsectively. The number (in parentheses) below is an approximate standard error for this sum.

Table 6
Wage Functions by Education and Sex: SIPP

Variable	Not HS Grad Male	Not HS Grad Female	HS Grad, Not College Grad Male	HS Grad, Not College Grad Female	College Grad Male	College Grad Female
Demographic Variables						
Black	-.175*	-.074*	-.164*	-.085*	-.137*	.019
	(.035)	(.035)	(0.021)	(.017)	(.049)	(.041)
Hispanic	-.120*	-.095*	-.077*	-.062*	-.013	.023
	(.037)	(.040)	(.030)	(.027)	(.067)	(.078)
Asian	-.231*	-.080	-.087*	-.102*	-.125*	-.033
	(.087)	(.072)	(.044)	(.040)	(.051)	(.060)
Married, Spouse Present	.073	.061	.110*	.028	.098*	.023
	(.040)	(.048)	(.020)	(.017)	(.032)	(.030)
Married, Spouse Absent	-.006	-.056	.095	-.049	.015	.283
	(.146)	(.135)	(.083)	(.064)	(.170)	(.166)
Divorced	.041	.038	.050	.038	.070	.035
	(.055)	(.054)	(.028)	(.021)	(.051)	(.044)
Separated	-.053	.128*	.039	.020	.154	.005
	(.077)	(.063)	(.045)	(.033)	(.111)	(.071)
Widowed	.093	.085	.081	-.035	.148	-.003
	(.100)	(.065)	(.079)	(.035)	(.150)	(.086)
Number of Own Kids	-.012	-.027	-.006	-.022*	-.002	-.049*
	(.014)	(.015)	(.008)	(.007)	(.015)	(.015)
Number of Kids < 18	.026	.008	.011	.025*	.001	.055*
	(.017)	(.019)	(.010)	(.009)	(.018)	(.019)
Disabled	-.089*	-.023	-.114*	-.040	-.126*	-.176*
	(.033)	(.036)	(.024)	(.023)	(.052)	(.057)
Experience + OJT						
Yrs. Full-Time Experience	.005*	-.003*	.011*	.005*	.017*	.007*
	(.001)	(.001)	(.001)	(.001)	(.002)	(.002)
FT Experience Squared	-.0004*	-.0001	-.0004*	-.0003*	-.0006*	-.0003*
	(.0001)	(.0001)	(.0001)	(.0001)	(.0001)	(.0001)
Yrs. Part-Time Experience	.006	.000	.004	.010*	.003	.000
	(.011)	(.006)	(.007)	(.003)	(.010)	(.006)
PT Experience Squared	-.0002	-.0001	.0003	-.0002	.0009	.0001
	(.0003)	(.0002)	(.0003)	(.0001)	(.0006)	(.0002)
Years Tenure w/Employer	.015*	.019*	.019*	.022*	.015*	.025*
	(.002)	(.002)	(.001)	(.001)	(.002)	(.003)
Years Tenure Squared	-.0002	-.0006*	-.0004*	-.0004*	-.0003*	-.0008*
	(.0001)	(.0002)	(.0001)	(.0001)	(.0001)	(.0002)
Years Out of Labor Force	.001	-.006*	.001	-.006*	.024*	-.006
	(.003)	(.002)	(.003)	(.002)	(.007)	(.005)
Years Out Squared	.0001	-.0000	.0001	.0002*	-.0011	.0000
	(.0002)	(.0001)	(.0002)	(.0001)	(.0006)	(.0002)
No. of Interruptions	-.057*	.008	-.040*	-.006	-.036	-.007
	(.021)	(.017)	(.014)	(.008)	(.018)	(.016)
Training 1979 or Before	.105*	.043	.094*	.024	-.033	.053
	(.037)	(.045)	(.017)	(.017)	(.035)	(.048)
Training 1980 or Later	.024	.124*	.043*	.073*	-.005	.072*
	(.046)	(.043)	(.016)	(.015)	(.027)	(.030)
Veteran Status	.018	.208	-.023	.021	0.018	-.049
	(.026)	(.208)	(.013)	(.042)	(.025)	(.113)
Current Work is Part-Time	.096*	-.135*	-.136*	-.133*	-.192*	-.122*
	(.044)	(.029)	(.027)	(.014)	(.051)	(.031)
Education						
Years School Completed	.019*	-.012*	.042*	.051*	.031*	.037*
	(.006)	(.006)	(.005)	(.005)	(.014)	(.015)
High School Courses						
Algebra			.017	-.008	-.002	.027
			(.016)	(.014)	(.063)	(.068)
Geometry or Trigonometry			.035*	.023	.039	-.018
			(.015)	(.014)	(.039)	(.036)

Table 6, Continued

Variable	Not HS Grad Male	Not HS Grad Female	HS Grad, Not College Grad Male	HS Grad, Not College Grad Female	College Grad Male	College Grad Female
High School Courses(cont.)						
Chemistry or Physics			.026	.035*	.023	-.027
			(.014)	(.013)	(.029)	(.027)
English (≥ 3 years)			.020	-.001	.104	-.161*
			(.022)	(.023)	(.063)	(.081)
Foreign Lang. (≥2 yrs)			.009	.042*	.041	.025
			(.015)	(.013)	(.023)	(.030)
Indus Arts etc (≥2 yrs)			-.019	-.029*	-.001	.009
			(.013)	(.011)	(.021)	(.023)
Business (≥ 2 yrs)			-.015	.019	-.027	-.010
			(.013)	(.012)	(.025)	(.025)
Field of Highest Degree						
Agriculture-Forestry					-.053	-.177
					(.066)	(.167)
Biology					-.187*	-.042
					(.066)	(.075)
Economics					.083	-.098
					(.062)	(.138)
Education					-.273*	-.155*
					(.037)	(.039)
Engineer-Comp Sci					.101*	.177*
					(.033)	(.083)
English					-.277*	-.121*
					(.064)	(.059)
Home Economics					-.651	-.042
					(.437)	(.086)
Law					-.032	.002
					(.081)	(.129)
Liberal Arts					-.240*	-.138*
					(.043)	(.047)
Math-Statistics					-.012	-.041
					(.064)	(.084)
Medicine					-.170	-.027
					(.089)	(.119)
Nursing					-.020	.156*
					(.091)	(.049)
Physical Science					-.018	-.123
					(.052)	(.090)
Law Enforcement					-.149	.002
					(.101)	(.156)
Psychology					-.211*	-.171*
					(.066)	(.064)
Religion					-.676*	-.388
					(.067)	(.205)
Social Science					-.184*	-.062
					(.045)	(.049)
Vocational					-.229*	-.090
					(.100)	(.406)
Other					-.078	-.106
					(.043)	(.055)
PhD					.161*	.339*
					(.053)	(.087)
Professional Degree					.126	.308*
					(.077)	(.096)
MA					.054	.112*
					(.032)	(.034)
R^2	.25	.18	.25	.25	.36	.32

Dummy variables for metropolitan area and region (3) not shown.
Years of tenure, full time experience, part time experience, and out of the labor force have been deviated from their education-specific mean (see text).

Table 7
Wage Regressions by Education and Sex: NLS72

Variable	High School Graduates		Some College		College Graduates	
	Male	Female	Male	Female	Male	Female
Demographic Variables						
Black	-.100	.012	-.054	.058	-.063	-.072
	(.062)	(.054)	(.071)	(.055)	(.075)	(.052)
Hispanic	-.083	.122*	-.066	-.094	-.024	.143
	(.065)	(.062)	(.075)	(.085)	(.096)	(.104)
Asian-American	.012	.330*	.107	-.270	.072	.082
	(.174)	(.135)	(.191)	(.187)	(.111)	(.093)
Other	-.008	.031	.011	.030	-.030	.018
	(.063)	(.065)	(.068)	(.076)	(.073)	(.072)
Married	.169*	-.017	.125*	.004	.095*	.006
	(.049)	(.048)	(.049)	(.050)	(.037)	(.034)
Marriage-Like Relationship	.042	-.083	.113	.192*	.100	.052
	(.083)	(.087)	(.090)	(.076)	(.091)	(.067)
Divorced	.065	-.039	.100	.095	-.081	.017
	(.064)	(.066)	(.073)	(.061)	(.075)	(.060)
Separated	.098	.060	.172	.085	.040	.010
	(.095)	(.074)	(.134)	(.102)	(.099)	(.088)
Widowed	.430	-.014	-.234	.094		-.535*
	(.425)	(.271)	(.306)	(.430)		(.271)
# of Children	-.004	-.026	.018	-.046*	.012	-.020
	(.016)	(.015)	(.016)	(.017)	(.015)	(.016)
Experience + Training						
Work Experience (years)	.002	.044*	.013	.042*	.010	.031*
	(.010)	(.006)	(.010)	(.007)	(.007)	(.007)
Tenure (years)	.013*	.019*	.022*	.014*	.018*	.016*
	(.004)	(.004)	(.004)	(.005)	(.005)	(.005)
Training < 1 month	.065	.077*	.065	.060	.030	.040
	(.040)	(.035)	(.043)	(.039)	(.034)	(.033)
Training 1 mo.-1 year	.041	.009	.035	.033	.009	.009
	(.040)	(.038)	(.042)	(.041)	(.035)	(.034)
Training ≥ 1 year	.199*	-.011	.114*	.002	.076	.010
	(.046)	(.079)	(.050)	(.065)	(.051)	(.058)
Left Training without	-.165	.118	-.129	.012	.089	.161
completing	(.106)	(.118)	(.088)	(.113)	(.133)	(.118)
Still in Training	-.241*	-.098	-.054	-.037	-.090	-.020
	(.109)	(.094)	(.083)	(.121)	(.082)	(.112)
Education						
# of Semesters in H.S.						
Science	.000	.002	.004	.002	-.004	-.002
	(.009)	(.010)	(.009)	(.010)	(.008)	(.007)
Foreign Language	.023*	.016*	.013	.005	.006	.011
	(.009)	(.008)	(.009)	(.008)	(.006)	(.006)
Social Studies	-.002	.006	-.011	-.002	-.018*	.004
	(.010)	(.009)	(.010)	(.010)	(.008)	(.009)
English	.000	-.008	-.002	-.021	.001	-.007
	(.011)	(.012)	(.012)	(.012)	(.011)	(.009)
Mathematics	.022*	.004	-.007	.000	.001	-.002
	(.010)	(.010)	(.010)	(.010)	(.009)	(.009)
Industrial Arts	.006	-.002	.001	-.002	-.001	.036
	(.004)	(.015)	(.006)	(.016)	(.007)	(.019)
Commercial	.001	-.008*	-.009	.007	-.002	-.006
	(.007)	(.004)	(.007)	(.005)	(.008)	(.006)
Arts	.002	.000	-.004	.003	-.010*	.000
	(.006)	(.005)	(.006)	(.006)	(.005)	(.004)

Table 7, Continued

Variable	High School Graduates		Some College		College Graduates	
	Male	Female	Male	Female	Male	Female
Cognitive Test Scores						
Vocabulary	.002	.003	-.006	-.006	.002	.000
(15 questions)	(.005)	(.005)	(.005)	(.005)	(.004)	(.005)
Reading (20 questions)	-.001	.010*	.008	.001	-.001	.002
	(.004)	(.004)	(.005)	(.005)	(.004)	(.004)
Math (25 questions)	.004	.003	.003	.012*	.007*	.000
	(.003)	(.003)	(.003)	(.003)	(.003)	(.003)
Years of Education			.035*	.052*		
			(.016)	(.017)		
PhD or Professional					.323*	.133*
					(.052)	(.068)
Masters					.066*	.097*
					(.033)	(.030)
Field of Highest Degree						
Agriculture-Forestry			-.275*	.035	-.377*	-.184
			(.107)	(.106)	(.084)	(.093)
Biology			-.086	-.068	-.329*	-.371*
			(.109)	(.143)	(.068)	(.085)
Clerical/Office			-.489*	-.037		-.196
			(.242)	(.060)		(.108)
Computer Technology			-.024	.104	.069	.164
			(.079)	(.090)	(.086)	(.105)
Education			-.117	-.144*	-.271*	-.254*
			(.084)	(.074)	(.053)	(.044)
Engineering			.124	-.105	.223*	.575*
			(.072)	(.163)	(.051)	(.221)
Mechanical Eng. Tech.			-.082	.381*	-.146	-.865*
			(.052)	(.189)	(.083)	(.275)
Humanities/Fine Arts			-.052	-.111	-.327*	-.259*
			(.085)	(.093)	(.057)	(.054)
Health			-.026	.072	.020	-.077
			(.092)	(.055)	(.111)	(.050)
Public Service			.048	.003	-.180	-.159
			(.072)	(.089)	(.078)	(.097)
Physical Science/Math			-.239*	.313	-.065	-.083
			(.111)	(.190)	(.072)	(.095)
Social Sciences			-.070	-.047	-.202*	-.314*
			(.080)	(.080)	(.047)	(.051)
Professional			-.038	.210	-.080	.031
			(.156)	(.117)	(.052)	(.069)
Other			-.063	.100	.004	-.150*
			(.076)	(.075)	(.062)	(.063)
No Major			-.042	.016	-.122	-.182
			(.057)	(.056)	(.127)	(.101)
R^2	.12	.27	.15	.24	.24	.21

Appendix Table 1
Male-Female Earnings Differentials Attributable to
Various Sets of Explanatory Variables (using male and female coefficients): SIPP

		Earnings Differential Attributable to									
Education Level	Model	Demographic Variables		Work Experience		Education		Job Variables		% Female in Occupation	
		$b_M \Delta \bar{X}$	$b_F \Delta \bar{X}$	$b_M \Delta \bar{X}$	$b_F \Delta \bar{X}$	$b_M \Delta \bar{X}$	$b_F \Delta \bar{X}$	$b_M \Delta \bar{X}$	$b_F \Delta \bar{X}$	$b_M \Delta \bar{X}$	$b_F \Delta \bar{X}$
<HS Grad [Gap=.359]	1	0.009 (0.007)	-0.008 (0.005)	0.132 (0.022)	0.138 (0.072)	-0.004 (0.001)	0.003 (0.001)				
	1'	0.005 (0.007)	-0.009 (0.005)	0.102 (0.020)	0.070 (0.070)	-0.004 (0.001)	0.003 (0.001)	0.064 (0.015)	0.054 (0.027)	0.100 (0.026)	0.059 (0.021)
≥ HS Grad < Coll. Grad	1	0.008 (0.003)	0.003 (0.002)	0.113 (0.013)	0.117 (0.019)	0.005 (0.000)	0.006 (0.000)				
[Gap=.375]	1'	0.008 (0.003)	0.002 (0.002)	0.084 (0.013)	0.070 (0.018)	0.006 (0.000)	0.005 (0.000)	0.062 (0.007)	0.054 (0.006)	0.029 (0.013)	0.094 (0.009)
	2	0.009 (0.003)	0.003 (0.002)	0.113 (0.013)	0.117 (0.019)	0.013 (0.006)	-0.005 (0.005)				
	2'	0.009 (0.003)	0.002 (0.002)	0.084 (0.013)	0.070 (0.018)	0.005 (0.006)	-0.011 (0.005)	0.062 (0.007)	0.055 (0.006)	0.033 (0.013)	0.095 (0.009)
≥ Coll. Grad [Gap=.367]	1	0.019 (0.005)	0.008 (0.005)	0.131 (0.017)	0.088 (0.040)	0.003 (0.001)	0.005 (0.001)				
	1'	0.016 (0.005)	0.009 (0.004)	0.106 (0.017)	0.049 (0.037)	0.005 (0.001)	0.004 (0.001)	0.084 (0.008)	0.020 (0.010)	0.008 (0.013)	0.098 (0.010)
	2	0.015 (0.005)	0.007 (0.005)	0.124 (0.016)	0.086 (0.039)	0.098 (0.015)	0.052 (0.016)				
	2'	0.014 (0.005)	0.008 (0.004)	0.111 (0.016)	0.048 (0.037)	0.061 (0.015)	0.014 (0.016)	0.059 (0.009)	0.033 (0.010)	0.005 (0.013)	0.077 (0.010)

Notes:
See Table 3

Appendix Table 2
Male-Female Earnings Differentials Attributable to
Various Sets of Explanatory Variables (using male and female coefficients): NLS72

Education Level	Line	Demographic Variables $b_M\Delta\bar{X}$	Demographic Variables $b_F\Delta\bar{X}$	Work Experience $b_M\Delta\bar{X}$	Work Experience $b_F\Delta\bar{X}$	Education $b_M\Delta\bar{X}$	Education $b_F\Delta\bar{X}$	Industry Dummies $b_M\Delta\bar{X}$	Industry Dummies $b_F\Delta\bar{X}$	Proportion Female in Occupation $b_M\Delta\bar{X}$	Proportion Female in Occupation $b_F\Delta\bar{X}$
H.S. Grad [Gap=.360]	1	.001 (.004)	.003 (.003)	.027* (.016)	.080* (.012)						
	1'	.001 (.004)	.002 (.003)	.026* (.015)	.072* (.012)			.014 (.018)	.052* (.023)	.018 (.033)	.090* (.022)
	2	.001 (.004)	.003 (.003)	.034* (.015)	.083* (.012)	.021 (.025)	.017 (.043)				
	3	-.000 (.004)	.001 (.003)	.033* (.015)	.083* (.012)	.024 (.025)	.017 (.043)				
	3'	-.001 (.004)	.000 (.003)	.031* (.015)	.073* (.012)	.018 (.025)	.023 (.041)	.024 (.018)	.060* (.023)	.020 (.033)	.084* (.022)
Some College [Gap=.233]	1	.002 (.007)	-.005 (.005)	.045* (.011)	.069* (.010)	.004* (.002)	.006 (.002)				
	1'	.001 (.007)	-.005 (.005)	.035* (.011)	.062* (.010)	.004 (.001)	.006 (.002)	.023 (.021)	.003 (.017)	.065 (.034)	.104 (.013)
	2	.001 (.007)	-.007 (.005)	.045* (.011)	.066* (.010)	.078* (.039)	.054 (.051)				
	3	-.001 (.007)	-.010* (.005)	.045* (.011)	.062* (.010)	.078 (.040)	.065 (.050)				
	3'	-.002 (.007)	-.009* (.005)	.035* (.011)	.056* (.010)	.067 (.038)	.053 (.049)	.028 (.021)	.012 (.017)	.068 (.035)	.094* (.024)
College Grad [Gap=.207]	1	.020* (.005)	.002 (.004)	.010* (.003)	.014* (.003)	.016* (.002)	.013* (.003)				
	1'	.017* (.005)	.005 (.004)	.009* (.003)	.012* (.003)	.020* (.002)	.011* (.003)	.043* (.009)	.026* (.012)	.061* (.018)	.055* (.014)
	2	.014* (.005)	.001 (.004)	.009* (.003)	.013* (.003)	.088* (.020)	.127* (.030)				
	3	.013* (.005)	.001 (.004)	.008* (.003)	.013* (.003)	.089* (.020)	.127* (.030)				
	3'	.013* (.005)	.002 (.004)	.007* (.003)	.012* (.003)	.064* (.021)	.083* (.029)	.036* (.009)	.026* (.012)	.027 (.018)	.058* (.014)

Notes:
See Table 4