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A look at the new job-task information in the National Longitudinal Surveys of Youth

Using data from the National Longitudinal Surveys of Youth 1979 and 1997, this article examines how the skill level and task content of U.S. jobs vary among workers born during the 1957–1964 and 1980–1984 periods. This article presents data on how job attributes vary by sex, race, Hispanic origin, and educational attainment as well as by performance on the Armed Forces Qualifying Test and type of occupation. It also examines the relationship between job attributes and wages.

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O*Net and DOT only supply information on job attributes at the occupational level.[4] The Princeton Data Improvement Initiative (PDII) is the only dataset we are aware of that has information on job attributes at the worker level. David H. Autor and Michael J. Handel use this dataset to analyze how tasks vary both within and across occupations.[5] Although their sample size is small (their regressions typically have 1,333 observations), they find meaningful task variation at the worker level, even controlling for occupation.

Recent National Longitudinal Surveys of Youth 1979 (NLSY79) and 1997 (NLSY97) fielded questions like those in the PDII. This article is the first to look at a new source of information on how job attributes vary among workers both within and across occupations. These new questions allow us to evaluate how analytical, routine, and manual job tasks vary within and across jobs as well as how they relate to workers' characteristics and wage differences.

Upon analyzing the data, we find that the distributions of tasks across occupations conform to one's expectations. However, we also find a substantial amount of job-task variation within occupations. Wage regressions indicate that at least some of the within-occupation task variation is

meaningful. Job-task information also appears to be helpful in explaining some of the wage variation among demographic groups.

In the sections that follow, we describe the NLSY data and provide an overview of the new information on job tasks. We then examine how job tasks vary among several demographic groups and analyze the relationship between job tasks and wages. In the final section, we conclude with our findings.

Data and characteristics of the sample

We analyze data in the NLSY79 and the NLSY97, the two active surveys. The NLSY79 is a dataset of 12,686 individuals who were ages 14 to 22, when first interviewed in 1979. These youth were interviewed annually from 1979 to 1994 and every 2 years since then. The NLSY97 is a dataset of 8,984 individuals who were ages 12 to 17, when first interviewed in 1997. These youth were interviewed annually from 1997 to 2017 and every 2 years since then. In the 2016–17 survey year, the NLSY79 obtained information on job attributes. The NLSY97 did the same in the 2017–18 survey year.

Seven questions from the PDII were added to the NLSY79 and the NLSY97. These questions evaluate (1) how much time is spent on physical tasks, (2) how much time is spent on repetitive tasks, (3) how much time is spent managing or supervising, (4) the frequency of resolving complicated problems, (5) the frequency of using higher level math skills, (6) the typical length of documents read at work, and (7) whether the respondent has much face-to-face contact with people other than coworkers and supervisors.[6]

The NLSY79 and NLSY97 samples used for this article are restricted to respondents who reported their sex and education and who have a valid Armed Forces Qualifying Test (AFQT) score.[7] Respondents also had to report a wage and occupation, answer all the job-task questions, and be currently working at the time of the interview. To classify respondents by educational attainment, we use their most recent report of highest degree completed. We also our restrict analysis to occupations with at least two observations.[8] After these restrictions, the sample from the NLSY79 consists of 3,606 workers, representing 291 occupations. The sample from the NLSY97 consists of 3,656 workers, representing 281 occupations.

An overview of the task variables in the National Longitudinal Surveys of Youth

The primary determinant of the tasks that workers perform on the job is the occupation they are in. Table 1 presents summaries of tasks by broad occupation for the NLSY79 and the NLSY97. (See appendix A, tables A-1 and A-2, for more detailed breakdowns of the task variables by broad occupation.) The distributions of tasks across broad occupations conform to one's expectations. Workers who are managers say that they spend most of their time managing and supervising. Workers who are managers and professionals spend the most time reading long documents and solving problems of more than 30 minutes. Construction, production, and transportation workers spend more time on physical tasks. Workers in clerical occupations spend more than half their time on repetitive tasks. Workers in production, transportation, and service occupations also spend much of their time performing repetitive tasks. As noted in the introduction, routine jobs have the highest risk of being displaced by automation.

Table 1. Task measures by major occupation group: employed workers

Tasks by survey	Manager	Professional specialist	Technical and sales	Clerical	Construction and repair	Production	Transportation	Service
National Longitudinal Survey of Youth 1979 (ages 52 to 59)								
Spend at least half time on physical tasks	18.01	27.23	56.07	32.83	85.52	79.72	87.55	72.40
Spend at least half time on repetitive tasks	21.11	24.16	47.72	58.43	39.70	58.03	58.85	63.99
Spend at least half time on managing or supervising	69.49	21.51	25.83	20.19	29.46	19.72	12.02	23.74
Solve problems of 30 or more minutes at least weekly	91.26	81.36	75.47	64.50	82.97	67.82	42.38	48.59
Use high school+ math at least weekly	24.62	26.76	17.80	11.27	28.67	23.91	15.62	13.24
Typically read documents of six or more pages	45.98	51.44	26.56	26.25	25.49	18.13	13.29	17.73
Have a lot of face-to-face contact (excluding coworkers)	44.03	51.09	67.14	41.22	38.60	17.36	45.63	64.47
National Longitudinal Survey of Youth 1997 (ages 32 to 38)								
Spend at least half time on physical tasks	22.11	25.26	54.90	26.43	90.97	84.35	84.22	74.74
Spend at least half time on repetitive tasks	24.32	20.89	47.69	63.36	50.41	65.53	71.21	62.88
Spend at least half time on managing or supervising	68.97	22.57	39.93	21.45	34.99	28.45	22.66	24.19
Solve problems of 30 or more minutes at least weekly	88.02	79.84	78.61	73.16	78.53	74.14	55.79	52.60
Use high school+ math at least weekly	35.48	31.05	28.30	21.66	50.64	30.54	20.64	13.91
Typically read documents of six or more pages	57.06	55.02	31.55	34.38	28.00	23.39	10.92	18.78
Have a lot of face-to-face contact (excluding coworkers)	53.39	55.78	67.69	39.05	44.66	16.44	46.66	72.81

Note: Task measures are in percentages.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

Jobs often involve the performance of several related multidimensional tasks. Therefore, looking at how the National Longitudinal Surveys task variables are correlated is important. The correlations in table 2 accord with one's intuition. Managing, problem solving, using math, and reading documents task variables are positively correlated with each other. The routine and physical-task variables are correlated with each other and negatively

correlated with managing, problem-solving, using math, and reading documents task variables. However, apart from the routine and physical-task variables, the correlations are not terribly strong. Unlike Autor and Handel's analysis, our analysis does not group together variables using principal components.[9] The relatively weak correlations among the analytical variables show that they are fairly different from each other and that grouping them would result in a loss of information.

Table 2. Correlations among PDII survey measures

PDII survey measures	PDII survey measures							
	Manage	Problem solving	Math	Read	Routine	Physical	Face-to-face contact	Education
National Longitudinal Survey of Youth 1979								
Manage	1.00	—	—	—	—	—	—	—
Problem solving	0.26	1.00	—	—	—	—	—	—
Math	0.18	0.27	1.00	—	—	—	—	—
Read	0.10	0.23	0.14	1.00	—	—	—	—
Routine	–0.14	–0.22	–0.13	–0.22	1.00	—	—	—
Physical	–0.13	–0.25	–0.04	–0.29	0.38	1.00	—	—
Face-to-face contact	0.13	0.02	0.05	0.02	–0.01	0.10	1.00	—
Education	0.10	0.24	0.17	0.28	–0.33	–0.04	0.10	1.00
National Longitudinal Survey of Youth 1997								
Manage	1.00	—	—	—	—	—	—	—
Problem solving	0.20	1.00	—	—	—	—	—	—
Math	0.15	0.24	1.00	—	—	—	—	—
Read	0.10	0.20	0.15	1.00	—	—	—	—
Routine	–0.05	–0.09	–0.09	–0.25	1.00	—	—	—
Physical	0.01	–0.15	–0.01	–0.28	0.40	1.00	—	—
Face-to-face contact	0.18	–0.01	0.00	0.00	–0.05	0.17	1.00	—
Education	–0.01	0.16	0.02	0.23	–0.34	–0.40	0.04	1.00

Note: PDII = Princeton Data Improvement Initiative.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

While the primary determinant of the tasks that workers perform is the occupation they are in, casual observation suggests that workers in the same job do not all perform the same tasks. We can determine how much tasks vary across occupations by regressing the task variables against the occupation dummies. Table 3 shows the portion of the total variation in the task variables that is explained when the task variables are regressed against the broad occupation dummies.[10] The portion of total variation explained is generally low. The math-task variable has the least explained variation. Only 3 percent of the variation is explained by broad occupation in the NLSY79, which means that 97 percent of the variation in this variable is unexplained. In the NLSY97, only 5 percent of the variation in the math-task variable is explained by broad occupation, which means that 95 percent is unexplained. The percentage of variation explained is greatest for the physical-task variable. Thirty percent of the variation in this variable is explained in the NLSY79. In the NLSY97, this figure is 31 percent. Thus, nearly 70 percent of the variation in physical tasks is unexplained by variation in broad occupation.

Table 3. Adjusted R-squared values from OLS regressions

Task variables by survey	Dependent variables						
	Manage	Problem solving	Math	Read	Routine	Physical	Face-to-face contact
National Longitudinal Survey of Youth 1979							
Broad occupation dummies	0.16	0.12	0.03	0.14	0.14	0.30	0.09
Demographics	0.02	0.09	0.05	0.16	0.20	0.19	0.02
Detailed occupation dummies	0.32	0.23	0.13	0.29	0.23	0.47	0.27
Demographics + detailed occupation dummies	0.33	0.24	0.14	0.31	0.30	0.49	0.28
National Longitudinal Survey of Youth 1997							
Broad occupation dummies	0.11	0.08	0.05	0.16	0.17	0.31	0.09
Demographics	0.01	0.04	0.04	0.14	0.23	0.22	0.02
Tasks on detailed occupation dummies	0.25	0.15	0.13	0.28	0.24	0.47	0.31
Demographics + detailed occupation dummies	0.25	0.16	0.13	0.30	0.32	0.49	0.32

Note: Included with demographic variables are dummies for education category and AFQT score quintile. OLS = ordinary least squares.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

In summary, a great deal of variation in the task variables is not explained by the broad occupation variables. This result is not surprising because the various broad occupation groupings are composed of several diverse occupations.[11] A more interesting experiment is to regress the task variables against detailed occupations. These results are also presented in table 3. While the detailed occupations explain more task variation than the broad occupations, a perhaps surprising amount of task variation is still within the detailed occupations. In fact, most of the variation in the task variables is not explained by the more detailed four-digit occupations and is thus variation within these occupations.

Table 3 also shows the variation in the task variables that is explained by the demographic variables plus the education and AFQT variables.[12] These variables alone generally explain less variation in the task variables than do the detailed occupation variables, except for reading and routine tasks reported in the NLSY79. Finally, table 3 shows the portion of the variation in the task variables that is explained by the four-digit occupations, the demographic variables, education, and the AFQT score. The addition of the demographic variables, education, and the AFQT score to the regression with the detailed occupation variables explains much more of the variation in the routine task for both cohorts. However, the additional variables explain little more of the variation in the remaining task variables for either cohort.

For both cohorts, the complete regression never explains more than 50 percent of the variation in any of the task variables. And for most task variables, the proportion of the variation explained is substantially less than 50 percent. Of course, some of the unexplained task variation is almost certainly statistical noise. The question that arises is, “Is any of the variation meaningful, and if so, how much?” One way to address this question is to look at whether the variation in the task variables explains variation in wages that is not explained by the detailed occupation variables. We look at this in a later section. First, however, we examine how tasks vary among demographic groups and across the two cohorts.

Variation in tasks among demographic groups

Table 4 summarizes the occupation distributions of our two cohorts by various demographic characteristics.[13] Men are more likely to be employed in management, construction, production, and transportation occupations, while women are more likely to be employed in professional, sales, clerical, and service occupations. This pattern is consistent for both cohorts. White workers are more likely to be employed in management and professional occupations, and Black workers are more likely to be employed in transportation and service occupations. Hispanic workers are more likely to be employed in clerical occupations, especially for the younger cohort in which nearly 1 in 5 Hispanic workers are in clerical occupations.

Table 4. Occupation shares by major demographic group: employed workers

Occupation by survey	All	Sex		Race and ethnicity			Education				AFQT score quintiles				
		Men	Wome	White	Black	Hispanic	Less than a high school diploma	High school graduates, no college	Some college or associate's degree	Bachelor's degree and higher	1st	2nd	3rd	4th	5th
National Longitudinal Survey of Youth 1979 (ages 52 to 59)															
Manager	15.39	18.39	12.20	16.65	8.36	12.48	3.14	8.92	14.54	26.05	5.13	8.80	13.29	16.47	27.70
Professional specialist	23.83	19.01	28.97	24.91	20.35	16.25	4.32	8.75	19.71	47.87	5.94	16.13	18.86	28.38	41.02
Technical and sales	10.70	9.15	12.35	11.23	7.03	10.97	8.69	10.20	15.84	7.71	7.19	10.91	11.42	13.80	9.10
Clerical	14.86	7.20	23.01	14.68	14.89	17.20	10.09	19.98	16.56	9.59	12.32	18.00	20.70	12.76	10.68
Construction and repair	8.37	15.76	0.51	8.52	6.79	9.56	19.84	11.95	8.22	1.69	12.91	10.79	8.96	8.75	2.82
Production	6.65	9.02	4.13	6.46	7.64	7.27	11.49	12.41	3.81	1.66	11.15	9.03	7.79	6.19	1.43
Transportation	6.25	10.23	2.01	5.37	10.53	9.53	16.34	9.27	5.02	1.35	15.02	9.25	4.50	4.15	2.08
Service	13.94	11.24	16.82	12.18	24.41	16.74	26.09	18.52	16.30	4.08	30.34	17.09	14.48	9.49	5.17
National Longitudinal Survey of Youth 1997 (ages 32 to 38)															
Manager	13.49	15.32	11.46	14.73	8.17	11.02	8.24	6.02	8.88	18.70	6.74	7.71	12.41	17.05	20.04
Professional specialist	29.35	23.46	35.89	31.65	21.86	23.31	4.83	7.34	11.94	48.56	8.17	17.91	26.91	37.04	47.13
Technical and sales	11.00	10.64	11.38	10.70	10.98	12.37	10.17	8.33	13.54	9.36	8.27	13.29	12.52	11.25	9.55
Clerical	12.74	8.00	17.99	11.31	15.14	19.38	8.94	9.34	16.21	10.69	14.38	12.46	14.90	12.54	10.30
Construction and repair	8.87	16.17	0.77	9.37	6.26	9.53	21.96	22.01	13.13	2.52	15.41	12.24	10.14	6.59	3.00
Production	4.29	6.01	2.38	4.54	4.34	3.10	8.27	8.89	7.00	1.12	9.33	6.09	3.16	2.90	1.74
Transportation	5.80	9.43	1.78	5.11	9.08	5.88	17.07	11.46	8.78	1.67	12.55	8.54	4.86	3.84	1.77
Service	14.47	10.97	18.35	12.58	24.17	15.42	20.52	26.63	20.53	7.37	25.15	21.77	15.09	8.77	6.47

Notes: Occupation shares are in percentages. Race and Hispanic or Latino ethnicity are mutually exclusive categories. For simplicity, non-Black non-Hispanics are referred to as White. Educational attainment is as of the most recent survey. AFQT = Armed Forces Qualifying Test.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

As table 4 shows, workers with more education are more likely to be in managerial and professional occupations and less likely to be in production, transportation, service, and construction occupations.[14] The pattern with respect to AFQT scores is similar to that for education. Individuals with higher AFQT scores in the NLSY79 and NLSY97 are more likely to be in managerial and professional occupations and less likely to be in production, transportation, service, and construction occupations.[15]

Given that the various demographic groups are distributed unevenly among occupations, one should expect that the task content of jobs will differ among demographic groups. Table 5 summarizes the task content of jobs by sex, race (White, Black, Hispanic), education (less than a high school diploma; high school graduates, no college; some college or associate's degree; bachelor's degree and higher), and AFQT score quintile for the 1979 and 1997 cohorts. (See appendix B, tables B-1 and B-2, for more detailed breakdowns of the task variables by demographic group, education, and AFQT score.) For the older cohort, we see that only about 21 percent of wage and salary workers use math at a high school level or above at least weekly, while a little less than 33 percent read documents longer than six pages regularly as part of their jobs. A larger percentage report solving somewhat complicated problems at least weekly (72 percent) and approximately 29 percent report spending at least half their time managing or supervising others. A little more than 48 percent of workers have a lot of face-to-face contact with people other than coworkers and supervisors as part of their job. This contact seems to be mostly with customers and clients: 43 percent of respondents indicate a lot of face-to-face contact with customers and clients, while far fewer have regular face-to-face contact with suppliers or patients (less than 12 percent in both cases).[16] A little less than 43 percent of workers in the NLSY79 report spending more than half their time on short, repetitive tasks and a little more than 48 percent report spending at least half their time doing physical tasks, such as standing, handling objects, or operating equipment.

Table 5. Task measures by major demographic group: employed workers

Tasks by survey	All	Sex		Race and ethnicity			Education				AFQT score quintiles				
		Men	Women	White	Black	Hispanic	Less than a high school diploma	High school graduates, no college	Some college or associate's degree	Bachelor's degree and higher	1st	2nd	3rd	4th	5th
National Longitudinal Survey of Youth 1979 (ages 52 to 59)															
Spend at least half time on physical tasks	48.17	53.57	42.38	46.15	60.43	50.75	75.90	63.81	47.38	25.18	73.14	62.50	52.20	39.56	26.13
Spend at least half time on repetitive tasks	42.58	36.72	48.82	39.32	58.87	54.02	58.35	58.50	44.50	20.45	61.05	63.89	49.15	33.58	17.16
Spend at least half time on managing or supervising	29.43	33.61	24.97	29.64	27.14	31.12	26.58	24.61	29.42	35.13	24.61	28.82	28.52	28.84	34.22
Solve problems of 30 or more minutes at least weekly	71.98	76.64	67.01	74.05	59.34	69.28	55.79	63.35	73.25	84.25	52.58	66.17	72.81	75.05	84.75
Use high school+ math at least weekly	20.56	24.49	16.37	20.65	19.01	22.55	16.27	14.56	20.75	27.73	14.57	18.28	17.46	21.19	28.20
Typically read documents of six or more pages	32.73	34.04	31.32	34.44	22.91	29.20	12.11	20.61	32.69	50.79	16.48	20.51	28.19	37.81	51.51
Have a lot of face-to-face contact (excluding coworkers)	48.49	43.18	54.14	47.64	53.98	48.88	46.06	43.24	53.60	50.50	48.85	51.44	49.91	48.02	45.11
National Longitudinal Survey of Youth 1997 (ages 32 to 38)															
Spend at least half time on physical tasks	47.18	52.26	41.55	45.45	56.57	47.14	85.12	77.14	62.26	27.66	74.51	63.38	46.21	25.35	26.69
Spend at least half time on repetitive tasks	43.24	41.99	44.62	38.55	60.84	53.48	72.57	69.05	56.87	26.17	67.71	63.30	48.84	31.34	17.89

See footnotes at end of table.

Table 5. Task measures by major demographic group: employed workers

Tasks by survey	All	Sex		Race and ethnicity			Education				AFQT score quintiles				
		Men	Women	White	Black	Hispanic	Less than a high school diploma	High school graduates, no college	Some college or associate's degree	Bachelor's degree and higher	1st	2nd	3rd	4th	5th
Spend at least half time on managing or supervising	32.19	35.63	28.37	32.31	31.57	32.67	37.57	35.92	31.09	32.13	33.61	33.49	32.54	29.75	32.20
Solve problems of 30 or more minutes at least weekly	74.26	77.11	71.12	76.00	66.77	72.81	60.24	66.63	70.51	79.53	63.03	73.39	77.35	74.61	79.52
Use high school+ math at least weekly	28.79	34.83	22.09	29.27	26.04	29.81	29.85	36.78	26.31	29.63	29.01	25.13	30.74	29.02	29.70
Typically reads document of six or more pages	38.52	39.47	37.49	41.38	27.37	33.69	14.10	20.92	28.53	51.10	17.90	29.18	38.39	41.68	56.61
Have a lot of face-to-face contact (excluding coworkers)	53.90	48.26	60.15	53.37	58.60	52.00	55.80	54.63	54.15	53.43	54.56	60.76	53.15	54.02	48.63

Notes: Task measures are in percentages. Race and Hispanic or Latino ethnicity are mutually exclusive categories. For simplicity, non-Black non-Hispanics are referred to as White. Educational attainment is as of the most recent survey. AFQT = Armed Forces Qualifying Test.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

As shown in table 5, the overall figures reported by the NLSY97 cohort are generally similar to those reported by the NLSY79 cohort. The largest difference concerns the use of math on the job. In the NLSY97, approximately 29 percent use math compared with 21 percent in the NLSY79. Some other differences exist but are smaller. Workers in the NLSY79 were ages 52–59 and entering the latter stage of their career when they were asked questions about their job tasks. In contrast, workers in the NLSY97 were ages 32–38 and entering the prime stage of their career when they were asked questions about their job tasks. It is interesting that job tasks in the two cohorts are distributed so similarly.

We have seen that both job tasks and worker demographics vary across jobs. We would therefore expect job tasks to be related to workers' demographic characteristics. We highlight a few interesting results from table 5 and follow this up later with a more detailed discussion based on regression analysis. In the 1979 cohort, women are much more likely than men (49 percent versus 37 percent) to spend more than half their time on repetitive tasks. For the younger 1997 cohort, women are only slightly more likely than men (45 percent versus 42 percent) to spend more than half their time on repetitive tasks. In both surveys, women engage in fewer tasks that involve managing, reading, and using math tasks.

Blacks and Hispanics are more likely than Whites to spend at least half their time on physical job tasks (46 percent, 60 percent, and 51 percent for Whites, Blacks, and Hispanics, respectively, in the 1979 cohort; and 45 percent, 57 percent, and 47 percent, respectively, in the 1997 cohort). Blacks and Hispanics also spend more time on repetitive tasks and less time reading documents and problem solving.

As expected, the time spent on repetitive tasks decreases as a worker attains more education. In the NLSY79, 58 percent of workers with less than a high school education and 20 percent of those with a college degree or more education spent at least half their time on repetitive tasks. In the NLSY97, the percentages were 73 percent and 26 percent for each group of workers, respectively. The same decreasing trend is true for AFQT scores. Of the NLSY79 workers, 61 percent in the first quintile and 17 percent in the fifth quintile spent at least half their time on short repetitive tasks. However, in the NLSY97, the percentage of workers were 68 percent and 18 percent, respectively, for each quintile. Similarly, workers with more education and higher AFQT scores are less likely to engage in physical tasks. The opposite is true of managing, problem-solving, and reading tasks. Workers with more education and higher AFQT scores are more likely to spend at least half their time on managing or supervising, to solve problems of more than 30 minutes weekly, and to typically read documents of more than six pages.

Regression analysis

To complete our analysis of how tasks vary among demographic groups, we also estimate regressions. Unlike the means reported in table 5, the resulting regression coefficients show comparisons holding all other variables in the equation constant. The regression results also provide a convenient way to test whether observed differences among demographic groups are statistically significant. The dependent variables in these regressions are "standardized task variables" that factor in the entire range of responses to the task questions.[17] Table 6 presents estimates when only demographic characteristics are included in the regression equations. The regressions tell a similar story as the means reported in table 5. In the NLSY79, women spend less time managing, reading long documents, problem solving, using math, and doing physical tasks, and they spend more time doing repetitive tasks. In the NLSY79, women have more face-to-face contact with individuals who are not supervisors or coworkers than do men. However, in the NLSY97, the women have less face-to-face contact. The

sex discrepancies are generally smaller in the NLSY97, most notably for repetitive tasks. And the sex discrepancy for math is greater in the NLSY97. As reported in the NLSY79, compared with Whites, Blacks spend less time reading documents and problem solving and more time doing repetitive and physical tasks. This discrepancy is generally attenuated in the NLSY97 and considerably so for problem solving and physical tasks. As do Blacks, though to a lesser degree, Hispanics also spend less time reading documents and problem solving and more time on repetitive and physical tasks. However, contrary to the discrepancies for Blacks, these discrepancies all increased by notable amounts in the NLSY97.

Table 6. OLS Regressions of standardized job tasks on demographic measures

Demographic category	Dependent variables						
	Manage	Problem solving	Math	Read	Routine	Physical	Face-to-face contact
National Longitudinal Survey of Youth 1979							
Women	–0.21[3]	–0.21[3]	–0.22[3]	–0.09[3]	0.28[3]	–0.23[3]	0.16[3]
Black	–0.04	–0.31[3]	–0.07	–0.33[3]	0.43[3]	0.33[3]	0.04
Hispanic	0.03	–0.12[1]	–0.05	–0.19[3]	0.32[3]	0.11	–0.02
Constant	0.07[3]	0.13[3]	0.03	0.05[2]	–0.21[3]	0.07[3]	–0.10[3]
Adjusted *R*-squared	0.01	0.02	0.01	0.01	0.05	0.02	0.01
National Longitudinal Survey of Youth 1997							
Women	–0.18[3]	–0.12[3]	–0.34[3]	–0.03	0.09[3]	–0.24[3]	–0.19[3]
Black	–0.02	–0.12[2]	–0.04	–0.22[3]	0.39[3]	0.08	–0.07
Hispanic	–0.02	–0.21[3]	–0.10[1]	–0.37[3]	0.53[3]	0.28[3]	0.01
Constant	0.15[3]	0.14[3]	0.32[3]	0.16[3]	–0.16[3]	0.05[1]	–0.55[3]
Adjusted *R*-squared	0.01	0.01	0.03	0.02	0.04	0.02	0.01

[1]Statistically significant at 1-percent level.

[2]Statistically significant at 5-percent level.

[3]Statistically significant at 10-percent level.

Note: OLS = ordinary least squares.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

Comparing the regressions for the two cohorts, one sees that from the NLSY97, individuals report spending substantially more time using math than do individuals in the NLSY79.[18] Other task differences exist but are smaller. Individuals in the NLSY97 spend somewhat more time in management (the constant and the coefficient for women are statistically larger in the NLSY97). They also spend somewhat more time reading and problem solving (all coefficients except those for Hispanics are statistically larger in the NLSY97). Women in the NLSY97 spend somewhat less time in routine jobs, and Blacks in the NLSY97 spend less time in physical jobs than do their counterparts in the NLSY79. Women in the NLSY97 spend somewhat more time having face-to-face contact with people other than coworkers and supervisors.[19]

The regressions in table 7 include education and AFQT. Adding education and AFQT has little effect on the coefficients for women in the task equations. In contrast, adding the education and AFQT substantially affects the coefficients for Blacks. The discrepancy for Blacks in problem solving and reading is substantially reduced in the NLSY79 and eliminated in the NLSY97. For Blacks performing repetitive tasks, the discrepancy is reduced in both

cohorts. However, in physical tasks, the discrepancy for Blacks is eliminated in the NLSY79 and becomes negative in the NLSY97 once one controls for education and the AFQT score.

Adding education and AFQT to the regression also affects some of the coefficients for Hispanics. The reading and problem-solving discrepancies for Hispanics are eliminated in the NLSY79 and greatly reduced in the NLSY97. The discrepancy for Hispanics in repetitive tasks is eliminated in the NLSY79 and substantially reduced in the NLSY97. When one controls for education and AFQT, in the NLSY79, Hispanics spend less time on physical tasks, and in the NLSY97, they spend about the same amount of time as non-Hispanics.

Table 7. OLS Regressions of standardized job tasks on demographic and human capital measures

Demographic category	Dependent variables						
	Manage	Problem solving	Math	Read	Routine	Physical	Face-to-face contact
National Longitudinal Survey of Youth 1979							
Women	–0.22[3]	–0.22[3]	–0.23[3]	–0.10[3]	0.27[3]	–0.22[3]	0.14[3]
Black	0.00	–0.13[2]	0.03	–0.08[1]	0.15[3]	0.06	0.03
Hispanic	0.08	0.05	0.09	0.05	0.09	–0.16[2]	–0.01
Less than a high school diploma	–0.02	–0.04	0.03	–0.14[2]	–0.11[1]	0.15[2]	–0.04
Some college or associate's degree	0.09[2]	0.18[3]	0.16[3]	0.25[3]	–0.14[3]	–0.26[3]	0.22[3]
Bachelor's degree and higher	0.25[3]	0.42[3]	0.34[3]	0.55[3]	–0.51[3]	–0.62[3]	0.28[3]
AFQT2	0.11[1]	0.24[3]	0.11[1]	0.16[3]	0.07	–0.17[3]	0.04
AFQT3	0.06	0.30[3]	0.08	0.27[3]	–0.16[3]	–0.29[3]	0.03
AFQT4	0.01	0.30[3]	0.13[2]	0.37[3]	–0.37[3]	–0.43[3]	–0.04
AFQT5	0.07	0.42[3]	0.23[3]	0.52[3]	–0.60[3]	–0.57[3]	–0.12[1]
Constant	–0.09	–0.35[3]	–0.26[3]	–0.51[3]	0.30[3]	0.69[3]	–0.21[3]
Adjusted *R*-squared	0.02	0.09	0.05	0.15	0.2	0.19	0.02
National Longitudinal Survey of Youth 1997							
Women	–0.18[3]	–0.17[3]	–0.35[3]	–0.11[3]	0.18[3]	–0.12[3]	0.18[3]
Black	–0.21	–0.04	0.01	–0.01	0.12[2]	–0.19[3]	–0.08
Hispanic	–0.03	–0.12[2]	–0.05	–0.09[1]	0.19[3]	–0.05	–0.01
Less than a high school diploma	0.05	–0.16	–0.24[2]	–0.13	0.03	0.06	–0.03
Some college or associate's degree	–0.09	0.11	–0.26[3]	0.14[2]	–0.12[1]	–0.24[3]	0.00
Bachelor's degree and higher	–0.01	0.33[3]	–0.13[1]	0.53[3]	–0.56[3]	–0.80[3]	0.11
AFQT2	–0.02	0.18[3]	–0.06	0.19[3]	–0.01	–0.11[2]	0.13[2]
AFQT3	–0.03	0.17[3]	0.09	0.35[3]	–0.26[3]	–0.36[3]	0.00
AFQT4	–0.09	0.15[2]	0.05	0.40[3]	–0.49[3]	–0.41[3]	–0.02
AFQT5	–0.04	0.16[3]	0.11[1]	0.64[3]	–0.75[3]	–0.65[3]	–0.10
Constant	0.23[3]	–0.20[3]	0.44[3]	–0.52[3]	0.54[3]	0.90[3]	–0.09
Adjusted *R*-squared	0.01	0.04	0.04	0.13	0.22	0.22	0.01

[1]Statistically significant at 1-percent level.

[2]Statistically significant at 5-percent level.

[3]Statistically significant at 10-percent level.

See footnotes at end of table.

Note: AFQT2 to AFQT5 = Armed Forces Qualifying Test quintile; OLS = ordinary least squares.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

Controlling for AFQT scores, we find that workers with more education, in the NLSY79, spend more time on math, but in the NLSY97, they spend less time on math. The higher the level of an individual's education, the greater the time spent on reading documents as reported in the NLSY79. In the NLSY97, only individuals with 4 or more years of college spend more time reading documents.[20] Workers with more education in the NLSY79 spend more time problem solving. The effect of education on time spent problem solving is weaker in the NLSY97 and only positive for 4 or more years of college. In both surveys, individuals with more education spend less time on repetitive tasks. Individuals with some college or more education have more face-to-face contact with nonworkers in the NLSY79 but not in the NLSY97.

Finally, looking at the coefficients on AFQT, one sees that in both surveys, individuals with higher AFQT scores spend more time reading and less time doing routine and physical tasks. The greater one's AFQT score, the more time is spent on problem solving in the NLSY79. In the NLSY97, individuals in the lowest AFQT quintile spend less time on problem-solving tasks than others, but no discernible difference in time is spent on problem solving among the four upper quintiles.

The regressions in table 8 include indicators for four-digit occupations. Adding the occupation variables primarily affects the coefficients for women, education, and AFQT score. Adding the occupation controls substantially reduces the coefficients for women in the management, problem-solving, and math tasks for both cohorts, with the problem-solving discrepancy eliminated entirely in the NLSY97. The coefficient for women in the physical-task equation is reduced to zero in both cohorts, and the coefficient for women in the face-to-face contact equation becomes negative. The education and AFQT effects generally become smaller when the occupation variables are added to the job-task regression equations.

Table 8. OLS Regressions of standardized job tasks on demographic measures, human capital measures, and occupation dummies

Demographic category	Dependent variables						
	Manage	Problem solving	Math	Read	Routine	Physical	Face-to-face contact
National Longitudinal Survey of Youth 1979							
Women	–0.14[3]	–0.09[2]	–0.14[3]	–0.14[3]	0.17[3]	–0.02	–0.08[1]
Black	0.07	–0.12[2]	0.03	–0.07	0.17[3]	0.02	0.03
Hispanic	0.06	0.01	0.06	0.01	0.11[1]	–0.09[1]	–0.04
Less than a high school diploma	0.07	–0.06	0.00	–0.09	–0.06	0.02	–0.01
Some college or associate's degree	0.01	0.08[1]	0.11[2]	0.11[3]	–0.07[1]	–0.07[1]	0.11[2]
Bachelor's degree and higher	0.05	0.19[3]	0.22[3]	0.21[3]	–0.26[3]	–0.18[3]	0.07
AFQT2	0.01	0.08	0.05	0.03	0.14[2]	–0.03	0.04
AFQT3	–0.08	0.08	0.02	0.11[2]	–0.08	–0.07	0.02
AFQT4	–0.12[1]	0.03	0.05	0.18[3]	–0.24[3]	–0.21[3]	–0.02
AFQT5	–0.13[2]	0.14[1]	0.11	0.24[3]	–0.45[3]	–0.26[3]	–0.09

See footnotes at end of table.

Table 8. OLS Regressions of standardized job tasks on demographic measures, human capital measures, and occupation dummies

Demographic category	Dependent variables						
	Manage	Problem solving	Math	Read	Routine	Physical	Face-to-face contact
Constant	0.07	–0.11[1]	–0.18[3]	–0.18[3]	0.15[3]	0.23[3]	–0.02
Adjusted *R*-squared	0.33	0.24	0.14	0.31	0.29	0.49	0.28
National Longitudinal Survey of Youth 1997							
Women	–0.09[2]	–0.03	–0.20[3]	–0.09[2]	0.14[3]	0.01	–0.08[2]
Black	–0.01	–0.07	0.03	–0.08	0.13[3]	–0.05	–0.07
Hispanic	0.04	–0.07	0.04	–0.08[1]	0.17[3]	–0.01	0.01
Less than a high school diploma	0.09	–0.20[2]	–0.19[1]	–0.11	0.01	0.04	0.00
Some college or associate's degree	–0.04	0.04	–0.19[3]	0.03	–0.09	–0.08	–0.07
Bachelor's degree and higher	–0.03	0.06	–0.17[2]	0.08	–0.33[3]	–0.29[3]	–0.05
AFQT2	–0.01	0.15[3]	–0.03	0.13[2]	0.02	–0.06	0.09[1]
AFQT3	–0.07	0.10[1]	0.05	0.18[3]	–0.15[3]	–0.15[3]	–0.07
AFQT4	–0.14[2]	0.05	–0.02	0.21[3]	–0.36[3]	–0.20[3]	–0.04
AFQT5	–0.12[2]	0.05	0.05	0.37[3]	–0.55[3]	–0.31[3]	–0.08
Constant	0.20[3]	–0.03	0.38[3]	–0.11	0.33[3]	0.32[3]	0.16[2]
Adjusted *R*-squared	0.25	0.16	0.13	0.30	0.32	0.49	0.32

[1]Statistically significant at 1-percent level.

[2]Statistically significant at 5-percent level.

[3]Statistically significant at 10-percent level.

Note: AFQT2 to AFQT5 = = Armed Forces Qualifying Test quintile; OLS = ordinary least squares.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

Wage regressions

As shown in table 8, a large amount of variation remains in the task variables, even after adding controls at the detailed occupation level. The question that arises is whether this variation is meaningful or simply statistical noise. To explore this question, we now estimate wage equations.[21]

We begin by examining how much wage variation across occupations can be explained by the job-task variables. Toward this end, we calculate the mean wage and the mean values of the job-task values in the various four-digit occupations. The results of regressing the logarithm (log) of the mean occupational wage against the mean task values are shown in the first two columns of table 9. The task variables are powerful predictors of occupational wages, especially in the NLSY79. Occupations in which workers spend more time on tasks that involve managing, problem solving, using math, and reading documents pay a higher wage (although the math and management tasks are not statistically significant in the NLSY97 occupational wage regression). Occupations in which workers spend more time on routine tasks and physical tasks pay a lower wage (time spent on physical tasks is not statistically significant in the NLSY97 regression). The task variables explain 68 percent of the occupational log-wage variation in the NLSY79 and 57 percent of the occupational log-wage variation in the NLSY79.

Table 9. OLS regressions of occupation-level mean log hourly wages on mean tasks, demographic, and human capital measures

Variable	Regression 1		Regression 2		Regression 3	
	NLSY79	NLSY97	NLSY79	NLSY97	NLSY79	NLSY97
Routine	–0.08[3]	–0.08[3]	—	—	—	—
Physical	–0.02[3]	–0.01	—	—	—	—
Manage	0.01[2]	0.01	—	—	—	—
Problem solving	0.05[3]	0.04[3]	—	—	—	—
Math	0.03[2]	0.02	—	—	—	—
Reading	0.01[3]	0.01[2]	—	—	—	—
Women	—	—	–0.52[3]	–0.42[3]	–0.19[3]	–0.13[3]
Black	—	—	–0.07	0.02	–0.01	0.01
Hispanic	—	—	0.13	–0.26[2]	0.05[1]	–0.07[3]
Less than a high school diploma	—	—	–0.16	–0.67[2]	–0.07[3]	–0.04621
Some college or associate's degree	—	—	—	0.12	0.02	0.07[2]
Bachelor's degree and higher	—	—	0.47[3]	0.51[2]	0.21[3]	0.24[3]
Experience	—	—	0	–0.14[1]	–0.03	–0.04[2]
Experience-squared	—	—	–0.02	0.54[1]	0.05	0.12[2]
AFQT2	—	—	0.36[2]	0.43[3]	0.04[1]	0.05[1]
AFQT3	—	—	0.59[3]	0.65[3]	0.14[3]	0.09[3]
AFQT4	—	—	0.58[3]	0.56[3]	0.17[3]	0.11[3]
AFQT5	—	—	1.00[3]	0.81[3]	0.24[3]	0.16[3]
Adjusted R-squared	0.68	0.57	0.73	0.66	0.13	0.07

[1]Statistically significant at 1-percent level.

[2]Statistically significant at 5-percent level.

[3]Statistically significant at 10-percent level.

Notes: NLSY79 sample is 291 occupations or 3,516 observations; NLSY97 sample is 281 occupations or 3,544 observations. AFQT2 to AFQT5 = Armed Forces Qualifying Test quintile, log = logarithm, NLSY79 = National Longitudinal Survey of Youth 1979, NLSY97 = National Longitudinal Survey of Youth 1997, and OLS = ordinary least squares.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

We next examine whether the task variables can explain wage variation within occupations. To do this, we calculate the difference between each individual's log wage and the mean log wage of all workers in the individual's occupation. We also calculate the differences between the individual's job-task variables and the mean job-task values of all workers in the occupation. The first two columns of table 10 show the results of regressing the log-wage difference against the job-task differences. The coefficients on the job-task differences are all statistically significant and have signs that are consistent with the across-occupation results: individuals who spend more time on managing tasks, problem-solving tasks, using math, and reading documents than their occupational counterparts receive a higher wage; and individuals who spend more time on routine tasks and physical tasks than their occupational counterparts receive a lower wage. However, the adjusted *R*-squared is only 0.12 for the NLSY79 and 0.07 for the NLSY97. We can conclude that some of the within-occupation variation in the task

variation is meaningful, but the task variables explain only a relatively small percentage of within-occupation wage variation.[22] This result is likely due to noise in both the task and the wage variables.

Table 10. OLS regressions of the difference between log hourly wages from occupation-level mean hourly wages on differences from the mean of tasks, demographic, and human capital measures

Variable	Regression 1		Regression 2		Regression 3	
	NSLY79	NLSY97	NLSY79	NLSY97	NLSY79	NLSY97
Routine	–0.02[3]	–0.02[3]	–0.03[3]	–0.03[2]	–0.01[3]	–0.01[3]
Physical	–0.02[3]	–0.02[3]	–0.02[3]	–0.01	–0.02[3]	–0.01[3]
Manage	0.01[3]	0.01[3]	0.01[2]	0.01[1]	0.01[3]	0.01[3]
Problem solving	0.02[3]	0.01[3]	0.02[2]	0.01	0.01[3]	0.01[3]
Math	0.01[2]	0.01[3]	0.01	0	0	0.01[3]
Reading	0.01[3]	0.00[3]	0	0	0.00[3]	0.00[3]
Women	—	—	–0.43[3]	–0.36[3]	–0.17[3]	–0.11[3]
Black	—	—	–0.10	–0.01	0	0.02
Hispanic	—	—	0.01	–0.22[1]	0.05[1]	–0.06[2]
Less than a high school diploma	—	—	–0.32[2]	–0.61[2]	–0.07[3]	–0.03742
Some college or associate's degree	—	—	0.19[2]	0.11	0.01	0.07[2]
Bachelor's degree and higher	—	—	0.14	0.39[1]	0.17[3]	0.22[3]
Experience	—	—	–0.16	–0.12	–0.01	–0.03[1]
Experience-squared	—	—	0.22	0.50[1]	0.02	0.10[1]
AFQT2	—	—	0.11	0.42[3]	0.04[1]	0.04
AFQT3	—	—	0.28[2]	0.51[3]	0.13[3]	0.07[2]
AFQT4	—	—	0.24[1]	0.46[3]	0.14[3]	0.08[3]
AFQT5	—	—	0.54[3]	0.59[3]	0.19[3]	0.11[3]
Adjusted R-squared	0.12	0.07	0.79	0.68	0.2	0.11

[1]Statistically significant at 1-percent level.

[2]Statistically significant at 5-percent level.

[3]Statistically significant at 10-percent level.

Notes: NLSY79 sample is 291 occupations or 3,516 observations; NLSY97 sample is 281 occupations or 3,544 observations. AFQT2 to AFQT5 = Armed Forces Qualifying Test quintile, log = logarithm, NLSY79 = National Longitudinal Survey of Youth 1979, NLSY97 = National Longitudinal Survey of Youth 1997, and OLS = ordinary least squares.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Surveys of Youth 1979 and 1997.

We conclude this section by examining to what extent the job-task variables can explain demographic wage differentials. The columns under regression 2 of table 9 show the results of regressing mean occupational wages against the mean occupation values of the demographic variables, education, and AFQT. As expected, occupations in which workers have more education and higher AFQT scores pay higher wages. It is also noticeable how much lower wages are in occupations with more female workers. In addition, in the NLSY97, wages are substantially lower in occupations that employ more Hispanics. Adding the mean occupational task values to this regression equation yields the results shown in the columns under regression 2 of table 10. The routine, physical, management, and problem-solving task variables are statistically significant in the NLSY79 regression, but only the routine variable is significant in the NLSY97 regression. The coefficients on education, the

AFQT score, and the demographic variables fall. The lower wage in occupations with a greater female presence is partly explained by the job-task variables, because adding these variables reduces the coefficient for women by 17 percent and 14 percent in the NLSY79 and NLSY97, respectively.

The last two columns of table 9 show the results of regressing the difference between an individual's log wage and the mean log wage in the individual's occupation against differences between the individual's demographic characteristics and the mean values of the demographic characteristics in the occupation. Individuals with more education and a higher AFQT score earn higher wages than their counterparts in the same occupation. And women receive lower wages than men.[23] Table 10's last two columns add differences between the individual's job-task variables and the mean job-task values of all workers in the occupation to this regression equation. The coefficients on the task differences are statistically significant with the expected signs (except for the math task, which is statistically insignificant in the NLSY79 regression). Some of the coefficients on the education and AFQT variables fall, but the coefficients on the demographic variables are affected only marginally.

Conclusion

Recent NLSY79 and NLSY97 obtain information on the tasks that workers perform on the job. In this article, we have provided an initial look at these data. The data show that substantial differences exist among demographic groups in the task content of their jobs. However, nearly all the racial and ethnic differences disappear once one controls for education and AFQT scores. In contrast, controlling for education and AFQT scores has little effect on the discrepancy between the task content of the jobs held by men and women. Adding four-digit occupation controls reduces but does not eliminate these discrepancies. Within occupations, women spend less time on tasks involving managing, problem solving, reading long documents, and using math and more time on tasks that are repetitive.

Workers in the NLSY79 were ages 52–59 and entering the latter stage of their career when they were asked questions about their job tasks. In contrast, workers in the NLSY97 were ages 32–38 and entering the prime stage of their career when they were asked questions about their job tasks. Workers in the NLSY97 report using more math on the job than do workers in the NLSY79. However, somewhat surprisingly, the job tasks in the two cohorts are mostly distributed similarly.

As one would expect, some of the variation in task content among workers is explained by their occupation. However, even after we added controls at the detailed occupation level, a great amount of task variation still exists within the detailed occupations. In fact, most of the variation in the task variables is not explained by detailed four-digit occupations.

The job-task variables explain a substantial portion of the variation in wages across occupations. Regressing the difference between an individual's wage and the mean occupational wage against the differences between the individual's job-task variables and the mean job-task values of all workers in the occupation provides some insight into whether any of the within-task variation that we observe is meaningful or whether it is nearly all simply statistical noise. The coefficients on the task variables are statistically significant, indicating that some of the within-occupation variation in job tasks is meaningful. However, the portion of within-occupation wage variation explained by the task variables is relatively small, because the adjusted R-squared is only 0.12 for the NLSY79 and 0.07 for the NLSY97.

We could not use the longitudinal information in the National Longitudinal Surveys because the job-task information has only been asked once for each cohort. Job-task information in future surveys could be helpful in examining how the content of individuals' jobs changes as they gain more labor market experience, which may be helpful in analyzing wage growth. Job-task information in future surveys could also be helpful in analyzing voluntary and involuntary job mobility as well as the consequences of automation. Researchers can also study comparisons across occupations by merging O*NET data into the NLSY79 and NLSY97. Perhaps the main advantage of the National Longitudinal Surveys job-task variables is that, unlike O*NET, they allow for comparisons within occupations. However, given that the NLSY job-task variables explain only a relatively small part of wage variation within occupations, the amount of value they add is not clear. A comparison of the NLSY job-task and the O*NET variables is a topic for future work.

Appendix A. Princeton Data Improvement Initiative task measures of employed workers, ages 52 to 59 and ages 32 to 38, by occupation

Table A-1. Employed workers ages 52 to 59

Task variable	Manager	Professional specialist	Technical or sales	Clerical	Construction or repair	Production	Transportation	Service occupations
Time on physical tasks								
Almost all	9.81	13.45	40.58	24.96	66.19	66.53	73.32	55.62
Half or more	8.20	13.78	15.49	7.87	19.33	13.19	14.23	16.78
Less than half	15.91	16.94	15.42	16.72	8.30	13.53	8.31	12.40
Almost none	66.09	55.83	28.51	50.45	6.18	6.75	4.14	15.20
Time on repetitive tasks								
Almost all	7.46	12.40	31.59	37.77	21.72	42.31	40.11	43.91
Half or more	13.65	11.76	16.13	20.66	17.98	15.72	18.74	20.08
Less than half	27.55	30.89	24.67	24.62	31.02	13.86	18.33	21.34
Almost none	51.35	44.94	27.60	16.95	29.28	28.11	22.82	14.66
Time on managing or supervising								
Almost all	47.40	11.79	17.13	13.41	20.63	14.08	6.90	14.07
Half or more	22.09	9.72	8.70	6.78	8.83	5.64	5.12	9.67
Less than half	15.10	21.29	22.02	13.86	16.00	19.19	5.64	15.01
Almost none	15.40	57.20	52.15	65.96	54.54	61.09	82.33	61.26
Solve problems of 30 or more minutes								
Daily	55.02	51.64	39.38	33.61	43.97	33.41	20.14	22.06
Weekly	36.24	29.72	36.09	30.89	39.00	34.41	22.24	26.53
Monthly	4.94	10.50	9.50	16.39	10.24	14.59	20.79	18.97

See footnotes at end of table.

Table A-1. Employed workers ages 52 to 59

Task variable	Manager	Professional specialist	Technical or sales	Clerical	Construction or repair	Production	Transportation	Service occupations
Never	3.80	8.14	15.03	19.11	6.80	17.59	36.83	32.43
Use high school+ math								
Daily	11.90	14.63	10.25	6.16	11.51	15.90	8.38	7.56
Weekly	12.72	12.13	7.55	5.11	17.16	8.01	7.24	5.68
Monthly	18.50	11.88	12.08	7.94	12.25	5.37	5.14	8.17
Never	56.88	61.37	70.12	80.79	59.07	70.73	79.24	78.58
Longest document typically read at job								
25 or more pages	17.57	21.53	6.09	9.28	9.02	7.88	4.68	5.60
6 to 25 pages	28.41	29.91	20.47	16.97	16.47	10.25	8.61	12.13
2 to 5 pages	37.81	33.96	33.68	33.24	35.96	24.66	21.44	23.49
1 or fewer	14.75	11.96	32.21	33.94	31.13	38.90	47.24	39.73
Never	1.45	2.63	7.56	6.57	7.42	18.30	18.03	19.06
Have a lot of face-to-face contact with people (excluding coworkers)								
A lot	44.03	51.09	67.14	41.22	38.60	17.36	45.63	64.47
A moderate amount	25.60	19.36	13.53	13.86	28.43	13.01	17.81	14.29
A Little	24.54	18.55	11.67	24.84	20.14	27.99	18.47	14.11
None	5.84	11.00	7.66	20.08	12.83	41.64	18.09	7.13
Have a lot of face-to-face contact with customers or clients								
A lot	42.10	34.21	68.63	40.95	40.11	13.79	46.46	58.72
Some contact	40.30	28.01	17.93	27.20	33.95	18.20	20.03	19.20
None	17.60	37.78	13.44	31.85	25.94	68.01	33.5	22.08
Have a lot of face-to-face contact with suppliers or contractors								
A lot	20.09	6.33	14.10	8.03	26.36	8.76	14.25	9.85
Some	57.02	37.84	48.71	41.26	40.62	37.30	24.17	38.78
None	22.88	55.83	37.19	50.44	33.03	53.94	61.58	51.36
Have a lot of face-to-face contact with students or trainees								
A lot	9.40	36.45	10.52	8.30	9.38	6.38	13.90	18.71
Some	45.71	29.60	38.94	33.01	28.65	37.88	22.23	36.22
None	44.89	33.95	50.54	58.69	61.97	55.74	63.87	45.07
Have a lot of face-to-face contact with patients (note, sample size is 3,596 for this variable)								
A lot	5.87	11.63	16.85	10.37	1.20	2.68	3.54	22.49
Some	7.54	3.88	4.44	3.57	4.71	2.37	2.84	7.20
None	86.59	84.49	78.70	86.06	94.10	94.95	93.59	70.31
Sample share	15.40	23.80	10.70	14.90	8.40	6.70	6.30	13.90

Note: From a sample of 3,606 observations.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Survey of Youth 1979.

Table A-2. Employed workers ages 32 to 38

Variable	Manager	Professional specialist	Technical or sales	Clerical	Construction or repair	Production	Transportation	Service occupations
Time on physical tasks								
Almost all	13.38	15.17	37.08	21.83	80.20	73.89	71.33	61.43
Half or more	8.73	10.09	17.82	4.60	10.77	10.46	12.89	13.31
Less than half	15.21	13.51	11.13	14.11	5.76	5.35	7.79	8.71
Almost none	62.68	61.23	33.97	59.46	3.26	10.30	7.99	16.56
Time on repetitive tasks								
Almost all	12.11	10.53	29.81	42.45	31.48	47.27	54.19	47.23
Half or more	12.21	10.36	17.88	20.91	18.93	18.26	17.02	15.65
Less than half	28.70	25.80	20.15	20.53	23.88	19.47	13.17	16.66
Almost none	46.98	53.31	32.16	16.11	25.71	15	15.62	20.46
Time on managing or supervising								
Almost all	50.29	13.76	29.36	15.11	23.74	22.06	16.45	18.37
Half or more	18.68	8.81	10.57	6.34	11.25	6.39	6.21	5.82
Less than half	13.86	24.12	17.21	18.48	22.04	17.67	10.56	17.33
Almost none	17.17	53.31	42.86	60.07	42.97	53.88	66.78	58.48
Solve problems of 30 or more minutes								
Daily	59.05	49.17	37.22	36.75	47.02	44.02	27.68	22.35
Weekly	28.97	30.67	41.39	36.41	31.51	30.12	28.11	30.25
Monthly	7.45	11.38	11.19	14.97	10.47	7.89	15.91	17.71
Never	4.54	8.77	10.21	11.87	11.01	17.97	28.30	29.69
Use high school+ math								
Daily	16.59	16.48	14.38	10.96	25.44	16.23	13.19	8.16
Weekly	18.89	14.57	13.92	10.7	25.20	14.31	7.45	5.75
Monthly	17.66	15.46	13.10	13.19	11.50	8.19	4.73	12.00
Never	46.86	53.49	58.61	65.08	37.86	61.27	74.63	74.09
Longest document typically read at job								
25 or more pages	25.56	27.42	12.36	11.20	12.54	5.55	3.20	5.52
6 to 25 pages	31.50	27.60	19.19	23.18	15.46	17.84	7.72	13.26
2 to 5 pages	26.30	29.46	32.89	33.79	28.97	22.66	26.07	20.90
1 or fewer	14.81	14.06	29.63	26.16	30.92	39.84	40.08	36.74
Never	1.83	1.46	5.93	5.67	12.11	14.11	22.93	23.58
Have a lot of face-to-face contact with people (excluding coworkers)								
A lot	53.39	55.78	67.69	39.05	44.66	16.44	46.66	72.81
A moderate amount	20.65	14.04	13.94	15.41	19.47	8.02	11.77	10.63
A little	16.37	17.79	10.00	19.04	23.04	30.70	15.97	9.12

See footnotes at end of table.

Table A-2. Employed workers ages 32 to 38

Variable	Manager	Professional specialist	Technical or sales	Clerical	Construction or repair	Production	Transportation	Service occupations
None	9.59	12.40	8.36	26.5	12.82	44.85	25.60	7.43
Sample share	13.50	29.40	11.00	12.700	8.90	4.30	5.80	14.50

Note: Measures make up 3,656 observations.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Survey of Youth 1979.

Appendix B. Task measures of employed workers, ages 52 to 59 and ages 32 to 38, by major demographic group

Table B-1. Employed workers ages 52 to 59

Task variable	All	Men	Women	White	Black	Hispanic	Less than a high school diploma	High school graduates, no college	Some college or associate's degree	Bachelor's degree and higher	AFQT score quintiles				
											1st	2nd	3rd	4th	5th
Time on physical tasks															
Almost all	35.1	39.1	30.7	32.6	49.6	39.0	64.3	49.3	33.4	13.8	62.3	46.8	37.3	25.8	16.0
Half or more	13.1	14.4	11.7	13.5	10.9	11.8	11.6	14.5	13.9	11.4	10.9	15.7	14.9	13.8	10.2
Less than half	14.5	13.7	15.3	15.0	11.1	14.2	11.0	13.9	15.5	15.2	11.1	12.6	14.2	17.9	15.0
Almost none	37.4	32.8	42.3	38.9	28.5	35.1	13.1	22.3	37.1	59.7	15.7	24.9	33.6	42.6	58.9
Time on repetitive tasks															
Almost all	26.4	21.6	31.5	23.1	42.7	37.3	40.2	36.8	29.5	9.4	45.3	41.7	31.1	17.5	6.9
Half or more	16.2	15.2	17.4	16.2	16.1	16.7	18.2	21.7	15.0	11.0	15.7	22.2	18.1	16.1	10.3
Less than half	25.5	25.0	26.1	26.5	20.9	21.8	16.8	22.2	29.5	28.3	18.9	21.4	25.2	30.6	28.4
Almost none	31.9	38.3	25.1	34.2	20.3	24.2	24.8	19.3	26.1	51.3	20.0	14.7	25.7	35.9	54.4
Time on managing and supervising															
Almost all	19.0	22.7	15.0	18.8	18.6	22.9	14.8	17.4	18.7	21.9	16.4	21.2	18.7	17.9	20.1

See footnotes at end of table.

Table B-1. Employed workers ages 52 to 59

Task variable	All	Men	Women	White	Black	Hispanic	Less than a high school diploma	High school graduates, no college	Some college or associate's degree	Bachelor's degree and higher	AFQT score quintiles				
											1st	2nd	3rd	4th	5th
Half or more	10.4	10.9	9.9	10.9	8.6	8.2	11.8	7.2	10.7	13.2	8.2	7.6	9.8	10.9	14.2
Less than half	16.9	17.3	16.5	17.2	16.3	13.6	13.3	16.4	14.7	20.1	14.2	14.9	15.7	17.6	20.5
Almost none	53.7	49.1	58.6	53.2	56.5	55.3	60.1	59.0	55.9	44.8	61.2	56.3	55.8	53.6	45.3
Solve problems of 30 or more minutes															
Daily	40.2	45.2	34.9	42.0	30.1	36.8	33.3	28.4	37.9	56.0	24.0	33.6	35.6	44.2	55.7
Weekly	31.8	31.4	32.1	32.1	29.3	32.5	22.5	35.0	35.3	28.2	28.6	32.5	37.2	30.9	29.0
Monthly	12.5	10.1	15.0	11.7	17.6	13.0	16.1	16.4	11.7	8.1	20.0	14.3	12.5	11.4	7.6
Never	15.5	13.2	18.0	14.3	23.1	17.7	28.2	20.3	15.1	7.6	27.4	19.6	14.7	13.6	7.7
Use high school+ math															
Daily	10.9	13.1	8.7	11.1	9.4	12.0	9.1	7.9	10.7	14.7	8.6	10.1	8.1	10.7	15.8
Weekly	9.6	11.4	7.7	9.6	9.7	10.6	7.2	6.7	10.1	13.0	6.0	8.2	9.4	10.5	12.4
Monthly	11.0	12.4	9.6	11.6	8.7	7.2	5.4	7.7	10.8	16.1	5.7	7.8	10.4	13.5	14.9
Never	68.5	63.2	74.1	67.7	72.3	70.3	78.4	77.7	68.5	56.2	79.7	73.9	72.1	65.3	57.0
Longest document typically read at job															
25 or more pages	12.2	14.0	10.3	13.0	8.0	10.3	4.1	6.4	11.0	21.3	5.2	6.2	9.8	14.4	21.4
6 to 25 pages	20.5	20.0	21.0	21.5	14.9	18.9	8.0	14.2	21.7	29.5	11.3	14.3	18.4	23.4	30.1
2 to 5 pages	31.7	31.6	31.9	32.5	28.6	27.3	24.0	29.0	34.3	34.6	22.1	31.5	34.5	34	33.2
1 or fewer	27.3	27.1	27.6	26.3	32.6	29.9	44.3	37.9	26.7	12.3	37	38.2	30.6	24.0	13.0
Never read	8.3	7.3	9.3	6.7	15.9	13.6	19.7	12.5	6.3	2.3	24.4	9.9	6.7	4.1	2.4
Have a lot of face-to-face contact with people (excluding coworkers)															
A lot	48.5	43.2	54.1	47.6	54	48.9	46.1	43.2	53.6	50.5	48.9	51.4	49.9	48.0	45.1
A moderate amount	18.4	21.5	15.1	19.1	14.6	16.4	14.2	19.3	17.3	19.5	14.2	16.1	20.0	18.5	21.4
A little	19.8	20.8	18.7	20.3	16.2	20.0	18.0	21.1	16.5	21.6	18.2	17.1	16.6	22.5	23.3
None	13.3	14.5	12	12.9	15.2	14.7	21.7	16.3	12.7	8.4	18.8	15.4	13.5	11	10.3

See footnotes at end of table.

Table B-1. Employed workers ages 52 to 59

Task variable	All	Men	Women	White	Black	Hispanic	Less than a high school diploma	High school graduates, no college	Some college or associate's degree	Bachelor's degree and higher	AFQT score quintiles				
											1st	2nd	3rd	4th	5th
Have a lot of face-to-face contact with customers or clients															
A lot	43.4	41.3	45.7	43.2	45.3	42.8	41.0	42.3	50.6	39.6	40.4	49.3	45.7	42.5	39.4
Some contact	26.8	29.6	23.8	27.7	22.6	23.6	22.8	25.7	24.9	30.6	22.8	20.2	26.4	31.5	30.4
None	29.8	29.1	30.4	29.1	32.1	33.6	36.3	32	24.5	29.8	36.8	30.4	27.9	25.9	30.2
Have a lot of face-to-face contact with suppliers or contractors															
A lot	12.4	17.4	7.1	12.2	14.3	11.0	13.4	12.9	14.8	9.7	13.1	14.7	10.4	13.5	10.8
Some	41.9	44.5	39.3	43.9	33.9	32.0	33.9	39.7	43.4	45.3	29.1	35.5	46.8	44	48.5
None	45.7	38.2	53.7	43.9	51.8	57.0	52.7	47.4	41.8	45.1	57.8	49.7	42.8	42.5	40.7
Have a lot of face-to-face contact with students or trainees															
A lot	17.2	11.0	23.7	16.7	21.9	14.5	13.5	12.2	13.9	25.9	17.8	19.4	14.2	15.6	19.2
Some	34.5	35.8	33.2	35.0	34.3	29.2	29.4	30.4	37.6	37.7	26.1	30.1	36.7	35.2	40.5
None	48.3	53.2	43.1	48.4	43.9	56.3	57.1	57.4	48.5	36.4	56.1	50.5	49.0	49.2	40.3
Have a lot of face-to-face contact with patients (note, sample size is 3,596 for this variable)															
A lot	10.7	4.8	16.9	9.8	15.0	13.4	8.7	9.1	15.2	9.3	12.6	14.2	11.3	7.4	9.2
Some	4.8	4.5	5.1	4.6	6.4	4.7	5.2	5.0	4.7	4.7	5.3	4.9	4.4	6.4	3.5
None	84.5	90.7	78.0	85.6	78.7	81.9	86.2	86.0	80.2	86.0	82.1	80.9	84.4	86.2	87.3
Sample	100.0	51.6	48.4	81.8	12.2	6.0	8.9	33.2	25.5	32.4	14.4	18.5	21.3	22.2	23.6

Notes: From a sample of 3,606 observations, restricted to occupations with 2 or more respondents—all other samples dropped. For simplicity, non-Black non-Hispanics are referred to as White. AFQT = Armed Forces Qualifying Test.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Survey of Youth 1979.

Table B-2. Employed workers ages 32 to 38

Task variable	All	Men	Women	White	Black	Hispanic	Less than a high school diploma	High school graduates, no college	Some college or associate's degree	Bachelor's degree and higher	AFQT score quintiles				
											1st	2nd	3rd	4th	5th
Time on physical tasks															
Almost all	36.4	40.6	31.8	34.1	47.8	38.5	70.5	66.7	50.6	17.9	63.3	51.6	34.9	15.2	17.0

See footnotes at end of table.

Table B-2. Employed workers ages 32 to 38

Task variable	All	Men	Women	White	Black	Hispanic	Less than a high school diploma	High school graduates, no college	Some college or associate's degree	Bachelor's degree and higher	AFQT score quintiles				
											1st	2nd	3rd	4th	5th
Half or more	10.8	11.7	9.7	11.4	8.8	8.7	14.7	10.4	11.7	9.7	11.2	11.8	11.4	10.2	9.7
Less than half	11.5	11.5	11.5	11.4	10.4	14.0	6.4	9.4	10.0	13.4	7.0	8.3	14.1	13.8	12.7
Almost none	41.3	36.3	47.0	43.2	33.0	38.9	8.5	13.5	27.7	58.9	18.5	28.3	39.7	47.2	62.4
Time on repetitive tasks															
Almost all	28.2	26.2	30.5	23.6	45.6	39.3	53.9	48.8	39.1	14.4	52.7	43.8	28.9	18.5	8.4
Half or more	15.0	15.8	14.1	15.0	15.3	14.2	18.6	20.2	17.8	11.8	15.1	19.5	20.0	12.9	9.5
Less than half	22.4	21.3	23.6	22.8	19.8	23.7	12.0	13.6	21.2	25.4	17.1	18.7	22.5	28.8	22.9
Almost none	34.4	36.7	31.8	38.7	19.4	22.9	15.5	17.4	21.9	48.4	15.2	18.1	28.7	39.9	59.2
Time on managing or supervising															
Almost all	22.6	25.4	19.6	22.1	25.0	24.3	33.0	26.7	22.6	21.3	27.5	24.2	22.7	21.3	19.4
Half or more	9.6	10.2	8.8	10.3	6.6	8.4	4.6	9.2	8.5	10.9	6.2	9.3	9.8	8.4	12.8
Less than half	19.0	19.4	18.6	20.4	15.4	15.5	13.8	16.6	16.7	21.7	15.6	15.7	18.1	19.2	24.5
Almost none	48.8	45.0	53.0	47.3	53.0	51.9	48.6	47.5	52.2	46.2	50.8	50.8	49.4	51.0	43.4
Solve problems of 30 or more minutes															
Daily	42.1	45.9	37.9	44.4	33.8	37.1	30.5	31.3	37.2	48.4	31.1	39.1	43.6	44.7	48.0
Weekly	32.2	31.3	33.3	31.6	33.0	35.7	29.7	35.4	33.3	31.1	32.0	34.3	33.8	29.9	31.5
Monthly	12.2	10.2	14.5	11.5	15.7	12.1	11.5	14.2	13.7	10.8	15.9	13.4	8.9	14.2	9.8
Never	13.5	12.7	14.4	12.5	17.5	15.1	28.2	19.2	15.8	9.6	21.1	13.1	13.7	11.2	10.7
Use high school+ math															
Daily	15.0	18.8	10.7	15.1	15.0	14.2	16.9	24.7	13.2	14.9	17.7	13.3	15.4	14.2	14.8
Weekly	13.8	16.1	11.4	14.2	11.1	15.6	12.9	12.1	13.2	14.7	11.4	11.8	15.4	14.8	14.9
Monthly	13.4	14.8	11.9	14.4	10.2	11.0	6.6	10.6	11.8	15.7	7.7	10.7	13.3	13.3	19.5
Never	57.8	50.3	66.0	56.3	63.7	59.2	63.5	52.6	61.9	54.7	63.3	64.2	56.0	57.7	50.8
Longest document typically read at job															
25 or more pages	16.6	17.5	15.6	18.5	10.4	11.0	4.6	8.1	11.5	22.9	6.2	9.0	16.1	18.4	28.2
6 to 25 pages	21.9	22.0	21.9	22.9	16.9	22.7	9.5	12.9	17.0	28.2	11.7	20.2	22.3	23.3	28.4
2 to 5 pages	28.2	27.2	29.3	28.2	28.5	28.4	26.4	27.1	27.3	29.2	28.2	27.4	28.5	30.4	26.5
1 or fewer	24.8	24.5	25.1	23.4	28.8	28.5	33.7	32.6	32.8	16.5	32.1	33.4	25.5	23.6	13.9

See footnotes at end of table.

Table B-2. Employed workers ages 32 to 38

Task variable	All	Men	Women	White	Black	Hispanic	Less than a high school diploma	High school graduates, no college	Some college or associate's degree	Bachelor's degree and higher	AFQT score quintiles				
											1st	2nd	3rd	4th	5th
Never read	8.5	8.8	8.1	7.0	15.3	9.4	25.8	19.4	11.4	3.2	21.7	10.1	7.6	4.4	3.0
Have a lot of face-to-face contact with people (excluding coworkers)															
A lot	53.9	48.3	60.2	53.4	58.6	52.0	55.8	54.6	54.2	53.4	54.6	60.8	53.2	54.0	48.6
A moderate amount	14.7	16.8	12.4	15.4	11.0	15.1	8.8	13.3	12.5	17.1	11.8	12.1	15.2	15.2	17.7
A little	16.6	19.0	13.8	17.5	13.0	14.3	14.0	13.1	15.3	18.3	13.7	13.6	18.4	15.9	19.9
None	14.9	15.9	13.6	13.7	17.4	18.6	21.4	18.9	18.0	11.2	19.9	13.5	13.3	14.9	13.8
Sample	100.0	52.6	47.4	73.7	13.6	11.3	4.1	6.7	40.0	49.2	15.8	18.6	19.5	22.0	24.0

Notes: From a sample of 3,656 observations, restricted to occupations with 2 or more respondents—all other samples dropped. For simplicity, non-Black non-Hispanics are referred to as White. AFQT = Armed Forces Qualifying Test.

Source: U.S. Bureau of Labor Statistics, National Longitudinal Survey of Youth 1979.

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Matthew Dey, Mark A. Loewenstein, and Hugette Sun, "A look at the new job-task information in the National Longitudinal Surveys of Youth," *Monthly Labor Review,* U.S. Bureau of Labor Statistics, May 2021, https://doi.org/10.21916/mlr.2021.10.

NOTES

1 David H. Autor, Frank Levy, and Richard J. Murnane, "The skill content of recent technological change: an empirical investigation," *Quarterly Journal of Economics*, vol. 118, no. 4, November 2003, pp. 1279–1333; Maarten Goos and Alan Manning, "Lousy and lovely jobs: the rising polarization of work In Britain," *The Review of Economics and Statistics*, vol. 89, no. 1, February 2007, pp. 118–133; and Daron Acemoglu and David Autor, "Skills, tasks and technologies: implications for employment and earnings, Chapter 12, *Handbook of Labor Economics*, vol. 4, part B, 2011, pp. 1043–1170.

2 Maxim Poletaev and Chris Robinson, "Human capital specificity: evidence from the Dictionary of Occupational Titles and Displaced Worker Surveys, 1984–2000," *Journal of Labor Economics*, vol. 26, no. 3, July 2008, pp. 387–420; and Chris Robinson, "Occupational mobility, occupation distance and specific human capital," *Journal of Human Resources*, Spring 2018, pp. 513–551.

3 Jonathan I. Dingel and Brent Neiman, "How many jobs can be done at home?" white paper (Chicago, IL: Becker Friedman Institute for Economics at the University of Chicago, April 2020), https://bfi.uchicago.edu/wp-content/uploads/BFI_White-Paper_Dingel_Neiman_3.2020.pdf; and Matthew Dey, Harley Frazis, Mark A. Loewenstein, and Hugette Sun, "Ability to work from home: evidence from two surveys," *Monthly Labor Review,* June 2020, https://doi.org/10.21916/mlr.2020.14.

4 A recent paper by Berger, Lopez-Garcia, Maestas, and Mullen uses the Occupational Information Network (O*NET) information on occupation ability requirements together with the self-assessed abilities of individuals in the American Work Capacity and Abilities Survey to analyze how the occupations that individuals are suitable for depend on their age, race, and sex. Ben Berger, Italo Lopez-Garcia, Nicole Maestas, and Kathleen Mullen, "The link between health and working longer: differences in work capacity," working paper (Stanford, CA: Stanford Institute for Economic Policy Research, Stanford University, September 2020).

5 David H. Autor and Michael J. Handel, "Putting tasks to the test: human capital, job tasks, and wages," *Journal of Labor Economics*, vol. 31, no. 2, 2013, pp. S59–S96.

6 In addition to the question about the amount of face-to-face contact with coworkers and supervisors, the National Longitudinal Survey of Youth 1979 (NLSY79), like the Princeton Data Improvement Initiative (PDII) survey, also asks about face-to-face contact with customers or clients, suppliers or contractors, students or trainees, and patients.

7 Armed Forces Qualifying Test (AFQT) scores are respondents' scores on a general aptitude and achievement test that they took when they were first initiated into the NLSY79 and National Longitudinal Survey of Youth 1997 (NLSY97) samples. The U.S. Departments of Defense and the military services have used these scores to update the norms on their entrance exams.

8 Because they were occupations with only one respondent, 70 occupations from the NLSY79 and 84 observations from the NLSY97 were deleted.

9 Autor and Handel, "Putting tasks to the test."

10 More precisely, the dependent variables in each regression are a standardized task value that we obtained by assigning cardinal values to the various responses. For example, for the physical-task variable, we assign a value of 4 to the "almost all" response, a value of 3 to "half or more," a value of 2 to "less than half," and a value of 1 to "almost none." Table 3 reports adjusted *R*-squared values, so the inclusion of additional variables does not guarantee an increase in the measure.

11 Broad occupation categories vary widely. As an example, the professional and specialist category includes occupations as diverse as elementary school teachers, registered nurses, designers, and computer software engineers.

12 Potential experience and potential-experience squared were also included in all regressions that include demographics and human capital measures.

13 Non-Black non-Hispanics will be noted as "White," for simplicity. Note that in the samples, more than 90 percent of non-Black non-Hispanics are White but Asians, Pacific Islanders, and Native Americans are also included in this category.

14 These relationships are monotonic. The likelihood that an individual is employed in production, transportation, and service occupations decreases with education, and the likelihood that an individual is employed in managerial and professional occupations increases with education. In contrast, individuals with some college are more likely than individuals in the other educational categories to be employed in clerical and technical and sales occupations.

15 As is the case with education, these relationships are monotonic. However, a different pattern emerges for clerical and technical and sales occupations. Individuals in the fourth quintile for AFQT scores are most likely to be in technical and sales occupations and individuals in the third and fourth quintiles are most likely to be in clerical occupations.

16 See appendix A, table A-1, and appendix B, table B-1, for additional face-to-face measures from the NLSY79. These measures were not available in the NLSY97.

17 These are the same variables as those used in the regressions in table 3 and that are described in endnote 10. We normalize the variables, subtracting their mean values when the two samples are pooled and dividing by their standard deviations.

18 Pooled regressions show that the constant term and the coefficients on women, Black, and Hispanic are all significantly greater in the NLSY97 math equation than in the NLSY79 math equation. The statistically significant differences noted in the rest of the paragraph can also be verified from pooled regressions.

19 In addition to asking the question about the amount of face-to-face contact with coworkers and supervisors, the NLSY79, like the PDII survey, also asks about face-to-face contact with customers or clients, suppliers or contractors, students or trainees, and patients.

20 Significantly more individuals obtain some college education in the NLSY97 than in the NLSY79, which means that the selection effect associated with higher education is likely weaker in the NLSY97 than in the NLSY79.

21 The wage is unrealistically low or unrealistically high in some of the observations. For the wage regressions, we have truncated the wage distribution to include only hourly wages that fall between the minimum wage of $7.25 at the lower end and $150.00 at the upper end. In the NLSY79, this finding resulted in dropping 65 observations at the lower end and 25 at the upper. In the NLSY97, this finding resulted in dropping 51 observations at the lower end and 61 at the upper end.

22 Our results are similar to those in Autor and Handel: Autor and Handel, “Putting tasks to the test.” Adding (principal components of) the task content variables to a wage equation that only includes (principal components of) O*NET variables, they find that the *R*-squared increases from 0.25 to 0.38, which means that adding the task variables explain 17 percent of the variance that is unexplained by the O*NET variables.

23 A thorough analysis of the female wage differential is beyond the scope of this article. As shown by other researchers (for example, see June E. O’Neil and Dave M. O’Neil, “What do wage differentials tell us about labor market discrimination?” [National Bureau of Economic Research, Working Paper 11240, 2005]), the negative coefficient is substantially reduced when one controls for actual work experience rather than for potential work experience.

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