NBER WORKING PAPER SERIES

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Working Paper 14007
http://www.nber.org/papers/w14007

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
May 2008

We acknowledge support from the National Institutes of Health from grants P30-AG024361 and P01-AG005842. The views expressed herein are those of the author(s) and do not necessarily reflect the views of the National Bureau of Economic Research.

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NBER Working Paper No. 14007
May 2008
JEL No. I1,J3

ABSTRACT

We use nine waves of the British Household Panel Survey (BHPS) to investigate the large labor market height premium observed in the BHPS, where each inch of height is associated with a 1.5 percent increase in wages, for both men and women. We find that half of the premium can be explained by the association between height and educational attainment among BHPS participants. Of the remaining premium, half can be explained by taller individuals selecting into higher status occupations and industries. These effects are consistent with our earlier findings that taller individuals on average have greater cognitive function, which manifests in greater educational attainment, and better labor market opportunities.

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1. Introduction

Recent research on the association between height, earnings and occupational choice shows that that each extra inch of height is associated with a one-to-two percent increase in average hourly earnings for men and women (Case and Paxson 2008). This labor market height premium can be explained largely by the association between height and cognitive function: healthier, better nourished children are significantly more likely to reach both their height potential and their cognitive potential. In two British birth cohort studies, the 1958 National Child Development Study (NCDS) and the 1970 British Cohort Study (BCS), there is a positive and significant association between height and cognitive function during childhood. Moreover, the height premium observed for these cohorts in adulthood largely disappears when test scores from childhood – a proxy for cognitive ability in adulthood – are added as controls.

In this paper, we examine the height-earnings nexus using nine waves of panel data from the British Household Panel Survey (BHPS). Labor market outcomes for the NCDS cohort are currently available only at ages 33 and 42, and the BCS at age 30, while the BHPS annually reports on labor market outcomes of adults of all working ages. In Wave 14 of the BHPS, information was collected on adults' heights. We use this information, together with labor market data collected annually from 1996 to 2005, to analyze the association between height, education, occupation and earnings in the BHPS. We find that each inch of height is associated with a 1.5 to a 1.8 percent increase in wages for both men and women. Non-parametric regressions (not shown here) indicate that this is true for the range of heights observed in the BHPS.

Our results differ from those presented by Heineck (2008), who also uses BHPS data to analyze the height premium. He concludes that his results "mainly do not reinforce the existence of simple linear height-wage premiums for tall workers" (page 293). The differences in conclusions reached by the two papers arise in part because of differences in the BHPS samples chosen for analysis. We use all data available in nine waves, Wave 7 (1997) to Wave 15 (2005), while Heineck uses data from Wave 14 only.

More importantly for the results, the papers also take different modeling approaches. Heineck mentions that "tall workers might self-select into occupations which reward being tall," and for this reason he analyzes height premiums by occupation (page 292). We believe this is problematic. If taller workers select into better-paying occupations, one would want to document that in the data, as it may highlight a channel through which the height premium operates. Even a large labor market height premium could be masked in analyses carried out solely within occupation. In addition, Heineck's choice to divide workers by sex into nine occupational categories, using just one wave of the BHPS, leads to very small cell sizes. We follow a different strategy, quantifying the extent to which height is associated with greater educational attainment and selection into higher skill occupations. We then examine the extent to which education, occupation and industry choice can explain the height premium we find throughout the height distribution.

2. Data and methods

Summary statistics for our sample are presented in Table 1. We analyze an unbalanced panel of individuals interviewed between 1997 and 2005. In any given wave, we use data on individuals who were ages 21 to 60 during that wave. Some individuals (those in middle age) will be present in every wave. Younger members of the BHPS may only be present in the last waves (after they reach age 21), while older members age out of our sample. Individuals must be present at Wave 14, when height data were collected.[1]

The samples of individuals are not large, with fewer than 4000 observations each for men and women. For this reason we divide occupations into three groups, which we refer to as "high skill" (managers and senior officials, professional occupations); "medium skill" (associate professionals and technical, administrative and secretarial, skilled trade, sales and customer service occupations); and "low skill" (personal services, process, plant and machine operators, and elementary occupations). We assign each individual the modal occupation skill level we observe for him or her between 1997 and 2005. We use multinomial logits to examine the relationship between height and occupation, and indicators for these three occupation-skill classes, when analyzing the relationship between earnings, height and occupation. In some specifications of the wage equations, we include 17 indicators of the individual's current industry as controls.

The complexity of the British education system does not allow a simple translation from educational milestones to years of completed education. For that reason, we use a categorical variable when quantifying the relationship between schooling and height (with "no schooling" equal to zero, a "Certificate of Secondary Education" (CSE) equal to one, and so on through "higher degree," which takes a value of six). We use ordered probits to examine the relationship between height and educational attainment,

[1]In our panel data regressions, we allow unobservables to be correlated for the same individual seen multiple times. Regression results are unweighted, but results are qualitatively and quantitatively similar when regressions are weighted using Wave 14 sampling weights.

and indicators for each education level, when analyzing the relationship between earnings, height and education.

3. Results

We present results on the association between height and educational attainment in the first column of Table 2.[2] For both men and women, an inch of height is associated with a positive and significant increase in the ordered probit index. For men, each inch of height has the same effect on the ordered probit index as a roll-back of the age clock of five years, so that movement from the 25th to the 75th percentile in the height distribution (an increase of 4 inches) has an association with educational attainment comparable to moving to a younger (and more highly-educated) generation.

The second set of columns in Table 2 present the change in the log odds of being in a high- or medium-skill occupation relative to being in a low-skill occupation, given a one inch increase in height. Being taller is associated with a greater probability of being observed in a higher skilled job, for both men and women. The change in the probability for men is especially noteworthy: every inch of height increases the probability of being observed in a high skill occupation, relative to a low skill occupation, by 16 percentage points.[3] Results in Table 2 suggest that height is significantly associated with greater educational attainment, and selection into higher skill occupations – both of which confer higher earnings capacity.

Table 3 presents estimates of the height premium found in the BHPS, and examines whether education, occupation and industry choice provide an explanation for

[2]Because educational attainment and occupation change little between the survey waves, we examine the relationship between height, education, and occupation once for each person followed by the BHPS.
[3]That is $0.118 \times (31.58/23.31)$.

the greater hourly earnings of taller people. The first column presents the coefficients on height from log hourly earnings regressions in which the sample is restricted to people ages 21 to 50 from Wave 14. Restricting the sample in this way, we come very close to replicating the findings reported in Heineck (2008). Younger workers are taller, on average,[4] but older workers have greater labor market experience and higher earnings on average. In order to avoid confounding height effects with age effects, the second column runs regressions for the same sample, but includes controls for age, age squared and race. Controlling for age (and, so comparing workers of the same vintage), the height premiums are substantially larger, particularly for men. Increasing the sample size in column 3, by adding workers ages 51 to 60, has no measurable effect on the height premium, although the standard errors are reduced due to the increase in sample size.

Opening the sample to observations from waves 7 through 15 in column 4 has little effect on results. However, the inclusion of indicators for educational attainment reduces the labor market height premium by half for men, and by two-thirds for women.[5] The addition of indicators for occupation and industry, which are themselves highly correlated with earnings, reduce the height premiums in half again. These results are consistent with the greater average educational attainment of taller workers and sorting by height into higher-paying occupations.

4. Conclusions

The evidence here confirms that each inch of height increases wages by approximately 1.5 percent, and shows that much of this premium can be explained by taller workers

[4] In the BHPS, each year of age is associated with a 0.04 inch reduction in reported height.
[5] In all regressions in Table 3 that include education indicators, they are jointly highly significant. This is true also for industry and occupation indicators.

obtaining more education and sorting into higher-status occupations. These findings suggest that the association between height and earnings may be driven by the influence of early life health and nutrition on adult height, educational attainment and occupational choice.

References

Case, A., Paxson, C., 2008. Stature and status: height, ability and labor market outcomes. Forthcoming in J. Polit. Econ.

Heineck, G. 2008. A note on the height-wage differential in the UK—Cross-sectional evidence from the BHPS. Economics Letters 98, 288-93.

Table 1
Weighted Means, British Household Panel Study 1997-2005, Ages 21-60

	Men	Women
Gross Hourly Pay (₤)	11.32	8.47
Height (inches)	69.99	64.38
Percent White	96.15	96.50
Age (years)	39.84	39.68
Region (percent):		
England	87.30	86.51
Scotland & Wales	11.46	12.18
Northern Ireland	1.24	1.31
Occupation (percent)*:		
High Skill Occupation	31.58	20.36
Medium Skill Occupation	45.11	54.58
Low Skill Occupation	23.31	25.05
Education (percent):		
None	15.04	15.97
CSE	6.97	6.97
O Levels	25.74	32.12
A Levels	24.74	19.63
HNC & HND	9.03	7.53
1st Degree	14.70	14.27
Higher Degree	3.77	3.52

*Occupation refers to the occupational class that the individual is seen in most frequently between 1997 and 2005. *Source*: BHPS 1997-2005.

Table 2
Education & Height and Occupation & Height in Wave 14

	Men		
	Dependent variable: highest education category completed	Dependent variable: Skill level of occupation held most often between 1997 and 2005	
	Ordered Probit:	Multinomial Logit: (base outcome: Low Skill Occupation)	
	Education	High Skill Occupation	Medium Skill Occupation
Height	0.040***	0.118***	0.055**
	(0.006)	(0.017)	(0.015)
Observations	3857	3673	

	Women		
	Ordered Probit:	Multinomial Logit: (base outcome: Low Skill Occupation)	
	Education	High Skill Occupation	Medium Skill Occupation
Height	0.038***	0.064**	0.050**
	(0.006)	(0.018)	(0.015)
Observations	3892	3718	

Standard errors in parentheses.
***p<0.01; **p<0.05; *p<0.1.
For ordered probits, the education categories are (from lowest to highest): none, CSE, O-Level, A-Level, HND/HNC, 1st degree, and higher degree. All regressions include controls for age, age squared, and an indicator that the respondent was white. If race is missing, the person is assigned a race value of "zero" and an indicator variable is included that race was missing. Results are unchanged if persons with missing race are not used in the analysis. *Source*: BHPS 1997-2005.

Table 3
OLS Estimates of height-wage differentials

	Men					
	Wave 14			Waves 7-15 (Age 21-60)		
	Age 21-50	Age 21-50 Controls for Age, Race	Age 21-60 Controls for Age, Race	Controls for Age, Race	Controls for Age, Race & Education	Controls for Age, Race, Education Occupation Industry
Height	0.008**	0.017***	0.017***	0.018***	0.009***	0.004**
	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	2360	2360	2849	20090	20090	20090

	Women					
	Wave 14			Waves 7-15 (Age 21-60)		
	Age 21-50	Age 21-50 Controls for Age, Race	Age 21-60 Controls for Age, Race	Controls for Age, Race	Controls for Age, Race, Education	Controls for Age, Race Education Occupation Industry
Height	0.012***	0.016***	0.016***	0.015***	0.005**	0.003*
	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)
Observations	2618	2618	3209	22576	22576	22576

Standard errors in parentheses.
****p*<0.01; ***p*<0.05; **p*<0.1.
All regressions for waves 7-15 include indicators for the wave. SOURCE: BHPS 1997-2005.