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Noncognitive skills, occupational attainment, and relative wages

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ABSTRACT

This paper examines whether men's and women's noncognitive skills influence their occupational attainment and, if so, whether this contributes to the disparity in their relative wages. We find that noncognitive skills have a substantial effect on the probability of employment in many, though not all, occupations in ways that differ by gender. Consequently, men and women with similar noncognitive skills enter occupations at very different rates. Women, however, have lower wages on average not because they work in different occupations than men do, but rather because they earn less than their male colleagues employed in the same occupation. On balance, women's noncognitive skills give them a slight wage advantage. Finally, we find that accounting for the endogeneity of occupational attainment more than halves the proportion of the overall gender wage gap that is unexplained.

1. Introduction

Despite falls in occupational segregation in many countries including the United States (Blau and Kahn, 2000), Canada (Fortin and Huberman, 2002), Britain (Hakim, 1992), and to a lesser extent Australia (Lee and Miller, 2004; Preston and Whitehouse, 2004; Rimmer, 1991), men and women often do very different kinds of work. A large literature investigates the implications of this gender segregation for labour market outcomes. The gender wage gap in particular is often attributed to gender segregation across occupations, industries, or jobs (see for example Blau and Kahn, 2000; Groshen, 1991; Mumford and Smith, 2007). Importantly, because male jobs are generally associated with higher wages, better benefits, and more training opportunities, the concern is that occupational segregation may result in an overall gender wage gap even if there is no wage disparity between men and women employed in the same occupation (Miller, 1994; Preston and Whitehouse, 2004; Robinson, 1998; Woden, 1999). Others, however, argue that occupational segregation may be relatively unimportant for women's wages (see Barón and Cobb-Clark, 2010; Bettio, 2002; Fortin and Huberman, 2002).

The process that leads to occupational segregation is not well understood. For instance, why do men and women work in different jobs? To what extent are gender differences in occupational distributions the result of demand-side factors or the result of differences in men's and women's preferences for certain types of work? How important are noncognitive skills like personality traits, self-efficacy, or interpersonal skills in generating the pattern of employment across occupations?

A small, but growing, economics literature has begun to assess these questions directly. In an earlier work, Andrisani (1977) shows that men with an internal locus of control are employed in better occupations and experience faster occupational advancement. Similarly, Filer (1986) finds that individuals' occupational choices are driven in part by their personality traits (i.e., emotional stability, restraint, objectivity) and preferences (i.e., the things that are most relevant to them in terms of defining personal success). Subsequent work has demonstrated that there seems to be a sensible match between the noncognitive skills of workers and the requirements of specific occupations. Positive core self evaluations (including high self-efficacy), for example, are positively correlated with accepting more challenging jobs (Judge et al., 2000), better job performance (Judge and Bono, 2001), and an ability to translate early advantage into later economic success (Judge and Hurst, 2007). Moreover,

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women are employed in safer jobs (DeLeire and Levy, 2001; Grazier and Sloane, 2008) or in jobs with low earnings risk (Bonin et al., 2007), which is consistent with the evidence that they are more risk averse than men (see Eckel and Grossman (2008) for a review). Borghans et al. (2008b) find that workers who were more social as youths choose jobs that involve interpersonal interactions specific to instructing or training people, influencing others, and making speeches or presentations. Similarly, Krueger and Schkade (2008) find that gregarious individuals tend to gravitate to the kinds of jobs that involve more social interactions. Finally, noncognitive skills have also been linked to the propensity to work full time (Braakmann, 2009) or in blue collar occupations (Ham et al., 2009).

It is likely that the link between a worker's noncognitive skills and his or her occupational attainment stems in part from the fact that personality traits appear to have labour market returns that are both occupation- and gender-specific (Mueller and Plug, 2006; Nyhus and Pons, 2005). This raises obvious questions regarding the extent to which gender differences in noncognitive skills can account for the disparity in men's and women's relative wages. Recent research investigates this issue and generally concludes that noncognitive skills have a significant, but rather modest, role in explaining the gender wage gap (Braakmann, 2009; Fortin, 2008; Linz and Semykina, 2008; Manning and Swaffield, 2008; Mueller and Plug, 2006; Tan, 2009). These studies, however, analyse the effect of personality on relative wages conditional on the existing occupational distribution, thereby ignoring the effect of men's and women's noncognitive and cognitive skills on their occupational attainment. As Borghans et al. (2008b) argue, however, the failure to account for the effect of various noncognitive skills on occupation-specific wages or in the assignment of people to jobs may underlie the relatively weak effect of noncognitive skills on the gender wage gap.

Our objective is to contribute to this emerging literature by explicitly assessing whether men's and women's noncognitive skills influence the occupations in which they are employed and, if so, whether this contributes to the disparity in men's and women's wages. We are particularly interested in the following questions. Do gender differences in personality (as measured by the Big Five) and locus of control or self-efficacy (as measured by the Pearlin and Schooler (1978) self-efficacy scale) help us understand occupational segregation? How important are noncognitive skills and occupational segregation in explaining the overall gap in men's and women's wages? We address these questions using unique data from the Household, Income, and Labour Dynamics in Australia (HILDA) survey which provides detailed information about noncognitive skills and labour market outcomes for a large, nationally-representative sample of individuals. Unlike much of the previous literature, we do not assume that the existing occupational distribution is exogenous. Rather we adopt an approach suggested by Brown et al. (1980) that allows us to account for the role of gender differences in noncognitive skills, human capital endowments, and demographic characteristics in producing both intra- and inter-occupational gender wage disparity.

We find that noncognitive skills have a substantial effect on the probability of employment in many, though not all, occupations in ways that differ by gender. Consequently, men and women with similar noncognitive skills enter occupations at very different rates. Women, however, have lower wages on average not because they work in different occupations than men do, but rather because they earn less than their male colleagues employed in the same occupation. On balance, our results suggest that women's noncognitive skills give them a slight wage advantage. Finally, we find that accounting for the endogeneity of occupational attainment more than halves the proportion of the overall gender wage gap that is unexplained.

In the next section, we discuss the estimation sample, the extent of occupational segregation, the size of the gender wage gap in Australia, and the noncognitive skills we consider in this analysis. Section 3 provides an overview of the estimation strategy, including the decomposition approach and model of occupational attainment. Our results are presented in Section 4, while our conclusions and suggestions for future research are outlined in Section 5.

2. The HILDA survey

2.1. The estimation sample

The estimation sample is taken from the Household Income and Labour Dynamics in Australia (HILDA) survey which collects panel data from a nationally-representative sample of more than 7,600 Australian households encompassing almost 20,000 individuals aged 15 and older (see Woden et al., 2002; Watson, 2009). The advantage of HILDA data for our purposes is their detailed information about individuals' demographic and human capital characteristics, occupational classification, hours of work, and labour market earnings. In addition, HILDA data provide information about a number of important noncognitive skills. The Pearlin and Schooler (1978) Mastery Scale was administered in waves 3 and 4 providing us with a measure of locus of control (self-efficacy), while individuals responded to a series of personality questions in wave 5 allowing us to utilise a taxonomy of personality known as the Big Five (see Caprara and Cervone, 2000). Finally, the ability to pool data across waves makes our results more robust to particular events affecting the labour market in specific years, improves the precision of our estimates, and reduces concerns about sample selection bias (Barón and Cobb-Clark, 2010).[1]

We use the first six waves of HILDA spanning the years 2001–2006 and have necessarily made a number of sample restrictions. In particular, we restrict the sample to include respondents who are aged between 25 and 65 years, are employees (not self-employed) and provide complete information for the variables of interest. In particular, although HILDA respondents enter the estimation sample by meeting the age restriction and being employed at least once between waves 1 and 6, they must also have provided information about their locus of control (in either wave 3 or wave 4) and about their personality (in wave 5). The estimation sample contains 2587 men and 2810 women with a total of 21,167 person-year observations.

Our dependent variable is the log of hourly wages. For each individual, this is calculated as the ratio of current weekly gross wages and the number of hours usually worked per week in all jobs. The Consumer Price Index (CPI) available from the Australian Bureau of Statistics (2008) is used to deflate wages to 2001 levels.[2] We have excluded from the analysis individuals who report very low (less than $4) or very high (over $90) hourly wage. Sample statistics (means and standard errors) are presented in Appendix Table A1.

2.2. Occupational segregation and gender wage gaps

We construct 18 occupational categories by combining related 2-digit (sub-major) occupations identified in the second edition Australian Standard Classification of Occupations (Australian Bureau of Statistics, 1997).[3] As our decomposition approach relies on wage

[1] There are many reasons to assume that there is an individual-specific error component in models of labour market outcomes. Given this, Barón and Cobb-Clark (2010) argue that pooling is potentially useful in reducing sample selection bias because it allows us to observe a larger fraction of the population. In particular, these authors document that, across waves 1–6, wave-specific participation rates for HILDA respondents aged 22 to 60 range from 57.6 to 66.2% for men and from 48.4 to 54.0% for women. However, fully 92.7% of men and 82.1% of women in this age range are labour market participants in the pooled waves 1–6 HILDA sample.

[2] Specifically, we deflate wages using the ratio of the 2001 September quarter CPI to the September quarter CPI in the appropriate year.

[3] See Appendix Table A2. Occupation-specific wages by gender are in Appendix Table A3.