

# **Occupational Choice: Personality matters**

**By**

**Roger Ham**

**University of Western Sydney,**

**P.N Junankar**

**University of Western Sydney,**

**University of New South Wales,**

**and IZA, Bonn,**

**and**

**Robert Wells\***

**University of Western Sydney**

**JEL Classification: J24**

**Key words: occupation, mobility, personality**

**\*Corresponding author: Email [R.Wells@uws.edu.au](mailto:R.Wells@uws.edu.au)**

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### **Abstract**

In modern societies, people are often classified as “White Collar” or “Blue Collar” workers. This classification informs us a great deal about the lives of individuals within these categories. This analysis examines the effect of an individual’s psychometrically derived personality traits and status of their parents on the probability of attaining a white collar occupation over the baseline category of a blue collar occupation, controlling for human capital and other factors. The paper uses data from the Household Income and Labour Dynamics in Australia (HILDA) survey to estimate a random effects probit model to capture the effects on the probability of being in a white collar occupation. The results are then examined using the average marginal effects of the different conditioning variables over the whole sample. The analysis confirms the previous findings of human capital theory, but finds that personality and parental status also have significant effects on occupational outcomes. The results suggest that the magnitude of the average marginal effect of parental status is small and the effect of the personality trait “conscientiousness” is large and rivals that of education. Finally, estimates of separate models for males and females indicate that effects differ between the genders for key variables, with personality traits in females having a relatively larger effect on their occupational outcomes due to the diminished effects of education.

## 1. Introduction<sup>1</sup>

One of the major features of labour markets, compared to other markets within an economy, is the large degree of heterogeneity found within the commodity that is exchanged, labour services. The two sources of this heterogeneity in labour markets come from the varied number of roles demanded to be filled by labour and the differing characteristics of individuals who supply their labour services within markets.

Labour services differ in terms of different knowledge, physical actions, tasks, equipment, environmental conditions, and ultimately different output. Yet despite these differences they all have a commonality in requiring human beings to provide these services qualified by these factors. The number of labour types that exist in the labour market can be effectively limitless; however, labour is often categorised into broad groups in which two individuals with similar traits can be considered close substitutes, and these groups are known as occupations (Boskin 1974).

There are numerous occupations in the labour market, and consequently various attempts to define and analyse different aggregations. These include and are not limited to: social status based ranking systems (Jones & McMillan 2001; Le & Miller 2001); Holland's six occupational types (Larson, Rottinghaus & Borgen 2002; Barrick, Mount & Gupta 2003; Porter & Umbach 2006; Rosenbloom *et al.* 2008); the ranking of occupations by skill—unskilled, semi-skilled, skilled, etc. (Darden 2005); and attempts to both objectively and subjectively define good jobs

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<sup>1</sup>The authors would like to thank Natalie Bosch, Ulises Garcia, Paul Frijters, Tony Beaton and other participants at a Brown Bag seminar at the Queensland University of Technology for useful comments and helpful feedback in the process of this research.

This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (MIAESR). The findings and views reported in this paper, however, are those of the authors and should not be attributed to either FaHCSIA or the MIAESR

The data used in this paper was extracted using the Add-On package PanelWhiz for Stata<sup>®</sup>. PanelWhiz (<http://www.PanelWhiz.eu>) written by Dr. John P. Haisken-DeNew ([john@PanelWhiz.eu](mailto:john@PanelWhiz.eu)). See Haisken-DeNew and Hahn (2006) for details. The PanelWhiz generated DO file to retrieve the data used here is available from me the authors on request. Any data or computational errors in the paper due to the authors.

and bad jobs (Junankar & Mahuteau 2005; Mahuteau & Junankar 2008). The most enduring aggregation of occupations is the dichotomy of white collar and blue collar occupations.

This research investigates what factors influence an individual's attainment of a white collar or blue collar occupation. White collar occupations consist of non-manual, office related, occupations. Examples of white collar occupations include professionals, clerical workers, sales people and managers. Blue collar occupations consist of manual, industrial, occupations. The use of the definition is beneficial as it highlights that jobs in white collar or blue collar occupations are not necessarily superior to each other.

In addition to occupations being varied, human beings vary greatly in their characteristics and therefore it is not logical to expect them to be easily classified as a homogenous commodity. Economic theory recognises that individuals exhibit differences in both their productive capabilities and their preference for the varieties of utility and disutility associated with the supplying of labour. Consequently, we expect that individuals are not equally suited to each role and thus these differences are contributing determinants to an individual's occupational outcome.

Human capital theory is focused on the effects of education, experience and an individual's innate ability in determining their productivity in various tasks and the utility they can derive from various remunerations from labour (Becker 1993; Becker 1996). Another source of heterogeneity that can affect an individual's outcome is the achievement of their parents. For example, if an individual's father or mother achieves a high occupational status, then this social status can assist in the achievement of a higher occupational status for the individual. This phenomenon of intergenerational occupational transfers is referred to as "dynasty hysteresis" (Bradley 1991).

A recently expanding area within economics is the combination of economics with psychology by using psychometrically determined personality traits to explain economic behaviour (Borghans *et al.* 2008). These traits affect occupational outcomes by both influencing the productive capabilities and the preferences an individual may exhibit in the labour market.

This paper, using the Household Income and Labour Dynamics in Australia (HILDA) dataset, examines how these sources of heterogeneity in labour markets influence occupational outcomes. Occupations are assigned to individuals through the interactions of the demand side factors for various types of labour services by firms and the supply decisions of individuals. Individuals are free to choose the occupation that maximises their utility given their characteristics and the constraints imposed by profit maximising firms. Occupational choice is analysed through a random effects probit model.

## 2. Occupational Choice

The first modern examination of occupational choice using discrete choice econometrics was Boskin (1974); who conducted an analysis of the effects of an individual's conditional wages and returns for a particular occupation on the probability that an individual will choose that occupation. Schmidt and Strauss (1975) examined the effects of human capital theory, such as education, experience, and other variables including gender and racial group, on occupational choice. Recently, Bjerk (2007) estimated a random effects probit model of being in a white collar or blue collar occupation and finds that education has a positive effect in the attainment of a white collar occupation. It should be noted that Bjerk's definition differs from the one adopted in this paper in that it is focused on good jobs and bad jobs as opposed to that of manual and non-manual jobs.

Currently, the bulk of the labour economics literature examines human capital effects with various different foci. These include their influences on wages (Mincer 1974; Meng & Miller 1995; Stevens 2003; Yu 2004), occupational outcome (Schmidt & Strauss 1975; Bradley 1991; Orazem & Mattila 1991; Mwabu & Evenson 1997; Pal & Kynch 2000; Harper & Haq 2001; Le & Miller 2001; Yuhong & Johnes 2003; Botticini & Eckstein 2005; Nasir 2005; Bjerk 2007; Hennessy & Rehman 2007; Croll 2008), choice of educational achievement (Schweitzer 1971; Turner & Bowen 1999; Montmarquette, Cannings & Mahseredjian 2002), gender and racial differences in occupational outcomes (Borooah 2001; Borooah & Mangan 2002; Borooah & Iyer 2005), and the potential heterogeneity of human capital including education, experience and

ability (Shaw 1984; Paglin & Rufolo 1990; Neal 1995; Bratti & Mancini 2003). This paper extends the existing literature by examining an additional set of determinants, namely personality traits and parental background.

The status of an individual's parents within a society has been argued to have an effect on the occupational achievement of their offspring. This phenomenon is referred to as "dynasty hysteresis" (Bradley 1991). Laband & Lentz (1983) argue that dynasty hysteresis is due to the ease with which human capital can be transferred, including ability, between parents and offspring. Alternatively, other work has examined the transmission of time preferences and the preferences towards leisure between generations resulting in such hysteresis (Doepke & Zilibotti 2005). Akerlof (1997) devised a model based on the individual's pursuit of social status with two conflicting forces, the desire to conform and the desire to excel, this is known as the theory of social distances. Another possible reason for dynasty hysteresis is the transfer of personality traits (Bowles & Gintis 2002; Blanden, Gregg & Macmillan 2007). Various works have examined the effects of parental social status and found it a valid determinant of occupational outcomes. (Tachibanaki 1980; Laband & Lentz 1983; Bradley 1991; Connolly, Micklewright & Nickell 1992; Constant & Zimmermann 2003; Sacerdote 2005; Tsukahara 2007; Croll 2008).

The examination of personality traits within the field of economics is an important step forward in our understanding of individual behaviour. Heckman and Rubinstein (2001) state that personality traits are the 'dark matter' of economics. Economics has long attributed seemingly irrational behaviour, that is behaviour which does not align with the majority, to individual differences in preferences (Becker 1996). Previously, it had been argued that preferences and personality were not a meaningful way to explain behaviour due to the large degrees of freedom that could be applied in assigning traits to behaviour, meaning that all personality based explanations were of an *ad hoc* manner (Caplan 2003). In addition, the lack of implementation of these factors was due to the inherent difficulties in measuring personality traits (Heckman & Rubinstein 2001).

McCrae and Costa (2003, p. 25) define personality traits as "dimensions of individual differences in tendencies to show consistent patterns of thoughts, feeling, and actions". This definition

highlights that personality traits are far from perfect predictors or the sole determinants of an individual's behaviour but reflect general propensities in which an individual, with a high level of a particular trait, is more likely to engage in a particular activity, *ceteris paribus*. The science of psychology has long addressed the measurement problem of “difficult to observe phenomena”, such as personality traits. To this end psychologists have embraced factor analysis in order to construct various tests and instruments to capture aspects of the human psyche, including personality traits and aspect of cognitive intelligence (Borghans *et al.* 2008).

Psychology of personality, has achieved a consensus and argues that personality traits can at a broad level be seen to be governed by five factors (Goldberg 1993). The Five Factor Model (FFM) consists of five broad dimensions of personality traits—summarised by the mnemonic OCEAN- which are: Openness to experience; Conscientiousness; Extraversion; Agreeableness; and Neuroticism (McCrae & Costa 2003).

Openness to experience can be defined as a trait associated with being accepting of new ideas and alternative points of view, appreciative of new concepts, imaginative and creative and generally inquisitive and curious. Conscientiousness is the trait that is associated with diligence, self discipline, punctuality, and hard work. Extraversion is the trait associated with being outgoing, energetic and talkative. Agreeableness is the trait associated with being warm, friendly, compassionate and empathetic. Finally, neuroticism is the trait that is associated with the ease which negative thoughts and feelings can affect an individual and is associated with traits such as irritability, being ‘thin skinned’ and anxious. Each of these dimensions also possesses a negative in which individual experience traits that are generally the opposite. Table 1 taken from McCrae and Costa (2003) provides a summary of characteristics that are associated with an individual's level of a particular personality trait, and reflects the negative (low score) as well as positive (high score) aspects of each trait.

**Table 1: Examples of the characteristics exhibited by people who score high and low in various personality traits**

<b>Personality trait</b>	<b>Low Scorer</b>	<b>Higher scorer</b>
Openness	Favours conservative values	Values intellectual matters

	Judges in conventional terms Uncomfortable with complexities Moralistic	Rebellious, nonconforming Unusual thought processes Introspective
Conscientiousness	Eroticizes situations Unable to delay gratification Self-indulgent Engages in fantasy, daydreams	Behaves ethically Dependable, responsible Productive Has high aspiration levels
Extraversion	Emotionally bland Avoids close relationship Overcontrol of impulses Submissive	Talkative Gregarious Socially poised Behaves assertively
Agreeableness	Critical, sceptical Shows condescending behaviour Tries to push limits Expresses hostility directly	Sympathetic, considerate Warm, Compassionate Arouses liking Behaves in a giving away
Neuroticism	Calm, relaxed Satisfied with self Clear-cut personality Prides self on objectivity	Thin-skinned Basically anxious Irritable Guilt-prone

Source: McCrae and Costa 2003

In psychology, a body of research has concluded that personality variables do have an impact on labour market outcomes (Barrick & Mount 1991; Larson, Rottinghaus & Borgen 2002; Barrick, Mount & Gupta 2003; Ozer & Benet-Martinez 2006; Furnham & Fudge 2008). Barrick and Mount (1991) put forward a number of hypotheses in their meta-analysis of the previous research within psychology on the effect of the five factor model. Conscientiousness is argued to carry a ubiquitously positive effect on labour market outcomes as individuals who possess this trait are often hardworking, productive, punctual, organised and accepting of responsibility. The paper also hypothesises that openness has an effect on the ability of individuals to be trained and thus also carries a highly positive value. Neuroticism was argued to be negatively valued as individuals who experience negative feelings more intensely might be less productive due to



their distress. The two social dimensions of agreeableness and extraversion to personality were argued to be valued primarily in social occupations. Barrick and Mount (1991) found that conscientiousness and openness behaved as predicted, extraversion was valued in both social jobs and training while agreeableness and neuroticism are observed to have no effect on labour market outcomes. Barrick and Mount (1991) argue that the lack of an observed effect with regard to neuroticism may be due to a sample selection bias as you require a minimum amount of emotional stability –the negative of neuroticism- to achieve a position in the labour market.

Economic theory has put forward a couple of models on how personality factors can be incorporated into the utility maximising behaviour of individuals. Borghans *et al.* (2008) provide a theoretical model of how personality traits can be viewed in terms of constraints, or rather as capacity, which only affect the relative ability of some tasks and not others. Another potential mechanism through which personality traits may influence economic outcomes is by incentive-enhancing preferences (Bowles, Gintis & Osborne 2001b). Individuals who possess certain characteristics may be more reactive to incentives as they have a lower marginal cost of increased effort. In practical terms these two theoretical models of how personality influences utility maximising behaviour are similar in that they both influence the relative utility of an action

The empirical work on the economics of personality is small but growing. The first study of personality in the field of occupational choice was that of Filer (1983). The findings seem to indicate that traits associated with conscientiousness and emotional stability – the negative of neuroticism - are valued more as one progresses from blue collar to white collar occupations. Heckman, Stixrud & Urzua (2006) provide an analysis of a wide variety of outcomes including: education; crime; smoking; teenage pregnancy; and, importantly to this study, the probability of being in a white collar occupation. They argue that these outcomes are affected by the personality traits of locus of control and self esteem, cognitive ability and education. The main finding of Heckman, Stixrud & Urzua (2006) is that personality traits have an effect that rivals cognitive ability and may be even greater, and this effect is much more pronounced in females.

The stability of personality has been a large area of debate within the literature on psychology. McCrae and Costa (2003) provide evidence to suggest that personality, as measured by the five factor model, is relatively stable with adults over time and argue that the underlying factors stem from, as yet, undetermined biological bases. However, observed behaviours determined by these stable psychological traits will vary according to the context that individuals find themselves in. This theory of the cause and stability of personality traits supports the idea of early intervention; Heckman (2008) reviews evidence that much of the biological formation of the human mind can vary in early childhood development with the environment, in which the biology forms. Evidence suggests that adult personalities are relatively stable at the broad level of the five factor model even over extended periods of time; however, this can be altered in extreme cases such as intensive psychotherapy and modifications to the brain (McCrae & Costa 2003). The stability of personality is a complex issue that has yet to be fully resolved and is outside the scope of this research. In this work, personality is treated as stable. This is on the basis that personality within adults, such as the working age individual, is relatively stable over the period of the dataset and at the broad level definitions of the five factor model (McCrae & Costa 2003).

To summarise, even though the literature in labour economics is dominated by wage determination, there is a strand which focuses on occupational choice. Whilst this, like wage determination, is weighted toward human capital theory, the occupational choice literature has also identified dynastic hysteresis and psychological personality traits as important in determining outcomes. The latter has involved the melding of economics with psychology and this has enriched occupational choice modelling. An interesting aspect of the development within the economics of psychology and occupational choice is the utilization of the five factor model to identify basic psychological traits. This paper builds on that literature by estimating a discrete choice model which focuses on the influence of the five psychological factors and dynastic hysteresis on the probability of being in a white collar occupation over a blue collar occupation.

### **3. Data**

This analysis uses data from the Household Income and Labour Dynamics in Australia (HILDA) surveys. HILDA is a nationally representative dataset of Australia consisting of 7,682 households containing 19,914 individuals as of Wave one (Watson 2008) and is used up to Wave

6 in this paper. The survey follows the same individuals over time and the sample is designed to grow and change in the same manner as the population does naturally. The survey collects a wide array of data on the behaviour and characteristics of individuals. The HILDA survey contents include, the occupational outcome, the highest level of education, parental occupation and social status, psychometrically validated measures of the personality traits in the five factor model, and other demographic variables, such as the age and gender of an individual. The data were compiled into files for analysis using PanelWhiz (Haisken-DeNew & Hahn 2006). This dataset has not been previously used in the analysis of occupational outcomes.

The dependent variable is a binary variable which represents the outcome of a white collar occupation with the value of one or a blue collar occupation with the corresponding value of zero. This response variable was derived using the one digit ASCO coding of occupations (Australian Bureau of Statistics & Australian Department of Employment Education Training and Youth Affairs 1997) provided within the HILDA data set. As previously stated, the definition that is applied throughout this analysis is based on manual labour versus non-manual labour. Using this definition, Managers, Administrators, Professionals, Associate Professionals, Clerical, Sales and Service workers are considered white collar occupations and consequently, Tradespersons, Production workers, Transport Workers, and Labourers are blue collar occupations. Whilst the top occupations, such as managers and professionals, are all in the white collar group, there are some individuals at low skill levels who are divided between white collar and blue collar occupations<sup>2</sup>. Thus, it is not possible to interpret white collar occupations as always higher, in terms of utility, than blue collar occupations, as a large number of occupations in the latter category are arguably superior to some of those designated as white collar. This is highlighted by Carol and Parry (1969) who, in their cost-benefit analysis of various occupations, find that certain occupations in the blue collar occupation have higher returns when the costs of education are accounted for.

Research in labour economics has long examined the effects of education on labour market outcomes. This research indicates that the approach used in Mincer (1974) specifying that

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<sup>2</sup> It should be noted that a three tier system of blue collar, white collar and professionals is often used in the literature. This definition may indeed be more meaningful but the true meanings of blue and white collar are lost in this process and thus this definition is not useful for the purpose of this analysis.

education as years of schooling and its square is inappropriate due to ‘credentialism’ effects (Park 1999; Heckman, Lochner & Todd 2003; Yu 2004; Leigh 2008). Education is specified here as the highest educational achievement measured in a series of binary variables to capture the non-linear effects of education on occupational choice. Other standard human capital variables such as age and age squared are used as a proxy for experience.

The analysis uses two measures of parent’s social status in order to more completely capture any possible dynastic effects. The first measure is a binary variable of the parent’s occupational status with the same dichotomy of white and blue collar. The second measure is the parent’s social status as ranked by the ANU4 (Jones & McMillan 2001). This measure is developed as an index of various socioeconomic characteristics, for example income, education, occupation, etc.. The index weights are derived using path analysis in order to minimise the direct effect of education on social status and maximize its indirect effect on other outcomes. Jones and McMillan (2001) find that various measures of social status tend to be highly correlated despite differences in specification.

The HILDA survey in Wave five used a modification of the test developed by Saucier (1994). Saucier (1994) developed a short test in which, individuals assess their personality compared to a list of adjectives. The HILDA dataset takes thirty of Saucier’s forty variables and an additional six from other sources (Losoncz 2007). Losoncz (2007) provides an analysis of the psychometric properties of the personality traits collected within the HILDA survey and finds that indeed the five factor model is replicated. It should be noted that based on the argument of the relative stability of personality traits captured by the five factor model, the measure from period five will be treated as the personality of the individual in all sample periods.

To summarise, this analysis uses the HILDA dataset, a nationally representative and detailed sample of the population of Australia that has yet to be used in the examination of occupational choice. The dependent variable is derived using the ASCO coding of occupations. The independent variables comprise a series of education binary variables, derived social status, psychometrically assessed personality traits and various control variables.

#### 4. Methodology

The focus of this analysis is the white and blue collar dichotomy. The dependent variable is binary, and the analysis uses a discrete choice econometric model for the conditional analysis of the two mutually exclusive outcomes. The probability score conditioned by the independent variables should be interpreted as the probability of an individual being in a white collar occupation against the alternative of a blue collar occupation. A binary probit model is used to analyse the conditional probability<sup>3</sup>.

The longitudinal data set allows for the use of panel econometric methods to control for unobserved heterogeneity; however, because of the incidental parameters problem (Neyman & Scott 1948; Lancaster 2000; Cameron & Trivedi 2005) choice has to be modeled as a random effects model specifically a random effects probit<sup>4</sup>. Some important conditioning variables are fixed for cross sections over the time period, negating the fixed effect specification. Finally, the fact that the data source is a comprehensive household survey which, in principle, could be subject to re-sampling, favours the random effects specification, Hsaio (2003).

The analysis uses various control variables such as industry, country of origin, marital status, geographic location and time period in order to control for factors which may condition outcomes. To allow for differences between males and females in labour market outcomes, a binary variable represent female is interacted with all the variables. A series of Wald tests will be

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<sup>3</sup> All estimates in the analysis used STATA 10. The average marginal effects were estimated using the ‘margeff’ module for STATA, Bartus (2005)

<sup>4</sup> While the probit can not be estimated as a fixed effect specification, there does exist a logit fixed effect specification. Both the logit and probit only differ in scale, however due to the other problems with the fixed effects approach, the random effect specification of the probit is retained.

employed to test whether these interactions are jointly significant overall, by variable group, and whether the effect for females is significantly different from zero.

A common approach to analysing the marginal effects of the conditioning variables is to calculate the effects at the means of the independent variables, (Cameron & Trivedi 2005). This analysis computes the average marginal effects using the `margeff` module for STATA (Bartus 2005) (Cameron & Trivedi 2005). Average marginal effects are simply the average of the marginal effect computed for each observation within the sample. Due to averages being the best single measure of central tendency, that is the measure that minimizes the error for the entire sample, the average marginal effects is the best single measure of the marginal effects. The average marginal effects is more realistic in that it evaluates all observations and not just those at the means which can be biased approximations (Bartus 2005). The average marginal effects can also be interpreted in the same manner as the coefficients of a linear regression model except that these effects are on average.

## 5. Results

The results for the estimations of the random effects probit model are reported in Table 5. This table contains the coefficients for the estimated model and the *average marginal effects* for all the models. Likelihood ratio tests for the significance of the random effects specification parameter ( $\rho$ ) reject the null of  $\rho = 0$  at all conventional levels of significance, indicating that the random effects panel specification is preferred to a pooled model.

**Table 5: Coefficients and average marginal effects for white collar and blue collar random effects probit regressions**

<i>Variable</i>	<i>Coefficients</i>	<i>Female Interaction coefficients</i>	<i>AME</i>	<i>AME for female interaction</i>
<b>Age</b>				
Age	0.1775***	-0.0291	0.0213***	-0.0035
age squared	-0.00018***	0.0002	-0.0002***	0.0000
<b>Marital status</b>				
Single	baseline	baseline	baseline	baseline
Married	0.4807***	-0.1901	0.0581***	-0.0227
De facto	0.0771	-0.0829	0.0094	-0.0100
Separated	0.0376	-0.0263	0.0046	-0.0032
Divorced	-0.4294**	0.6068**	-0.0530**	0.0713**
Widow	1.3965**	-1.6555**	0.1533**	-0.2060**
<b>State</b>				
NSW	baseline	baseline	baseline	baseline
VIC	0.0384	-0.0410	0.0046	-0.0049
QLD	-0.0650	-0.2871	-0.0079	-0.0344
SA	-0.0978	0.4288	-0.0119	0.0500
WA	-0.0318	0.1643	-0.0038	0.0194
TAS	-0.2166	-0.2435	-0.0263	-0.0291
NT	0.4412	-0.4293	0.0523	-0.0516
ACT	1.053***	-1.5853***	0.1197***	-0.1958***
<b>Education</b>				
PhD or Masters	3.6851***	-1.8741***	0.2283***	-0.2364***
Graduate diploma	2.0298***	-0.5377	0.1960***	-0.0679
Bachelor degree	1.8577***	-0.5654**	0.1879***	-0.0714**
Advanced diploma	0.7384***	-0.1776	0.0984***	-0.0223
Certificate 3 or 4	-0.8926***	0.6617***	-0.1532***	0.0799***
Certificate 1 or 2	-1.5862***	0.7189	-0.2860***	0.0865
Certificate NA	0.0145	-0.4559	0.0022	-0.0575
Year 12	baseline	Baseline	baseline	baseline
Year 11 or less	-1.2423**	0.4228**	-0.2195***	0.0518**
<b>Personality</b>				
Agreeableness	-0.1148*	0.0856	-0.01379*	0.0103
Conscientiousness	0.1473***	0.1149	0.01769***	0.0138
Emotional stability	0.1310**	-0.02121***	0.01573**	-0.0255***
Extraversion	0.0043	0.0277	0.0005	0.0033
Openness	.1951***	-0.1930**	0.02344***	-0.0232**
<b>Parent Status</b>				
Dad is white-collar	0.4769***	-0.2475	0.05899***	-0.0294
Mum is white-collar	0.1091	-0.2168	0.0132	-0.0258
Father's ANU4	0.0036	0.0004	0.0004	0.0001
Mother's ANU4	0.0024	0.0010	0.0003	0.0001
<b>Time periods</b>				
t1	baseline	baseline	baseline	baseline
t2	0.0634	0.0081	0.0076	0.0010
t3	-0.0104	0.1782	-0.0013	0.0214
t4	0.0114	0.1698	0.0014	0.0203
t5	0.0163	0.1467	0.0020	0.0176
t6	-0.0344	0.2322**	-0.0041	0.0277**
<b>Industry</b>				
Agriculture	0.9545***	-1.3926***	0.1562***	-0.1696***
Mining	0.0812	-0.4673	0.0140	-0.0545
Manufacturing	baseline	baseline	baseline	baseline
Gas & water	0.2359	0.8268	0.0404	0.0876
Electricity	-0.8813***	1.9267***	-0.1521***	0.1763***
Construction	-6.2882***	0.0204	-0.6251***	0.0023

Wholesale	-0.1088	-1.6708***	-0.0188	-0.2057***
Retail	1.6327***	-0.9049***	0.2453***	-0.1078***
Transport	-0.0358	-0.2254	-0.0062	-0.0259
Communication	0.0053	-0.3262	0.0009	-0.0377
Finance	3.1293***	-0.9010*	0.3476***	-0.1074*
Property	1.2490***	-0.7166***	0.1980***	-0.0846***
Government	1.1453***	-0.0694	0.1784***	-0.0079
Education	1.9891***	0.1059	0.2812***	0.0119
Health	1.9907***	-0.1895	0.2813***	-0.0217
Culture	0.9818***	-0.0590	0.1602***	-0.0067
Personal	0.7380***	-0.7103***	0.1230***	-0.0838**
<b>Country of origin</b>				
Australia	baseline	baseline	baseline	baseline
English speaking nation	0.1511	-0.3653	0.0181	-0.0438
Non English speaking nation	-0.1543	-0.6036**	-0.0186	-0.0729**
<b>Other parameters</b>				
Constant (and female intercept shift parameter)	-6.5155***	3.4467***		0.4364***
Rho	1.3150***			
Legend	*: p<0.1	**: p<0.05	***: P< 0.01	

Females have a higher probability of approximately 0.43 over males of achieving a white collar occupation. As previously stated, white collar occupations are not necessarily superior occupations even though many of the higher occupations are classified as white collar. Due to social conventions, occupations which are white collar but not of high status may be dominated by females. That is this probability of a female occupying a white collar job may not reflect higher occupational status.

With respect to human capital theory both age and education were found to have a significant effect on occupational attainment. Age is found to have a significantly positive effect on the probability of being in a white collar occupation, but this effect decreases as individuals get older with no differences between the genders. University level education, such as Bachelor, graduate Diploma, Masters and Doctorates, and the non-university tertiary education of an advanced diploma all increase the probability of an individual attaining a white collar occupation. Conversely, tertiary education such as Certificates 1 through 4 and having less than year 12 education have a statistically significant and negative effect on the probability of attaining a white collar occupation compared to a completed high school education. The effect of an individual lacking a completed high school education not increasing the probability of a blue collar occupation suggests that individuals who acquire certificates are trade focused and are more likely to enter higher status blue collar occupations. The gender interaction effects show that with regards to PhD or Masters, Bachelor, Certificate 3 or 4, having an incomplete high



school education is statistically significant, negative but to a smaller magnitude than the male effect. This suggests that education has a lesser effect on female white collar occupations.

Binary variables associated with industry, State, and time period are significant, suggesting that many of the effects on occupational outcomes are driven by industrial composition, which is reinforced by the State because of the regional concentration of industries. It should be noted that the only significant State is the ACT which is a highly specialised region which primarily provides for the Federal government. The binary variable for country of origin shows that migrants from a non-English speaking country who are female are less likely to be in a white collar occupation.

Turning to dynasty hysteresis, parental status produces interesting effects on individual occupational outcomes. We found only the binary variable representing a father's status in either a white collar occupation to take on statistical significance. This effect was consistent across both genders and caused individuals to have a 0.06 increase in their chance of being in a white collar occupation. Comparing the size of this effect to human capital finds that it is dramatically smaller with effects to about a half to a quarter of those found with human capital variables.

Personality, as measured by the five factor model, is the focus of the paper. Four of the five personality traits, all except extraversion, have a highly significant effect on the occupational outcome; however these effects vary by gender. Conscientiousness - the trait associated with persistence, punctuality, hard work, etc. - is found to have a highly significant and positive effect on occupational achievement for both genders. That is, increasing conscientiousness raises the probability of being in a white collar occupation. This finding is consistent with the previous literature both in economics and psychology. Individuals with the highest levels of conscientiousness can enjoy an additional bonus of about 0.108 (a marginal effect of  $0.018 \times 6$ ) on their probability of achieving a white collar occupation compared with their lowest conscientiousness counterparts. This bonus can be seen as almost equal to a bachelor degree for females and about half of one for males.

Openness, the trait associated with the desire for new experiences and ideas, has also achieved statistical significance but only for males. As previously mentioned, openness has been hypothesized to act through the desire of an individual to learn and be trained (Barrick & Mount 1991). The effect of openness is larger than the effect for conscientiousness. The effect of openness in the male sample is larger; an increase in the probability of being in a white collar occupation by 0.14 ( $0.023 \times 6$ ).

Emotional stability is another variable that is significant for males and females. Emotional stability, the negative of neuroticism, which shows how easily negative emotions affect an individual, carries a positive impact suggesting that males who react less emotionally have an increased probability of being in a white collar occupation. The effect of emotional stability on males is close to the same as the effect of conscientiousness.

Agreeableness, that is the ability to get along, has a less significant effect at the 10% level compared to the other personality traits and carries a negative effect, but only for males. This suggests that agreeableness is not desirable in white collar occupations and an individual who is agreeable is less likely to obtain these jobs. The agreeableness results seem to coincide with the findings of Mueller and Plug (2004) that the absence of agreeableness may help to negotiate wages and in the achievement of an individual's objectives.

Personality effects can be seen as having an impact that may rival education. These effects are pronounced when an individual possesses high combinations of these personality traits. Given the smaller effect of education and the relatively large effect of conscientiousness for females, it can be suggested that conscientiousness matters more for females than it does for males. This finding can be seen qualitatively similar to that of Heckman, Stixrud & Urzua (2006) in that they find that non cognitive factors, as opposed to cognitive factors, have a greater effect for females than males in occupational attainment.

## **6. Conclusion**

This paper focused on the examination of personality factors, parental social status, and human capital on the attainment of a white collar occupation. The analysis used the HILDA panel survey data to estimate a random effects probit model. In addition to finding education significant for white collar occupations, we found that the effects of personality may potentially rival but are generally smaller than that of education while the father's occupational status is significant. Interactive binary variables were used to estimate separate marginal effects for males and females and results indicate that female occupational attainment is less sensitive to characteristics and that the personality trait of conscientiousness is important. Future work will examine a more detailed occupational breakdown; making use of multinomial models of occupational choice, and will explore the optimal specification of the model. These refinements will lead to more detailed and precise estimates of the effects of personality and parental status on occupational choice.

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