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**Factors influencing adult savings and investment: Findings from
a nationally representative sample**

Adrian Furnham¹ and Helen Cheng^{2,3}

*¹BI: Norwegian Business School, Nydalsveien 37, 0484 Oslo, Norway²Research Department of
Clinical, Educational and Health Psychology, University College London, London WC1E 6BT,
UK³ESRC Centre for Learning and Life Chances in Knowledge Economies and Societies, Institute
of Education, University College London, London WC1H 0AL, UK*

Corresponding author:

Prof. Adrian Furnham: adrian@adrianfurnham.com

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Abstract

This study explored a longitudinal data set of over 5766 adults examining factors that influence adult savings and investment. Data were collected at birth, in childhood (at age 11) and adulthood (at ages 33 and 50yrs) to examine the effects of family social status, childhood intelligence, adult personality traits, education and occupation, and personal financial assessment on adult savings and investment. Results from structural equation modelling showed that parental social status, educational qualifications and occupational prestige, trait Conscientiousness, personal financial assessment and gender all had significant and direct effects on adult savings and investment, accounting for 26% of the total variance. The strongest predictor of adult savings and investment was their personal subjective financial assessment followed by educational qualifications and current occupational prestige. Limitations and implications are considered.

Word Count:

Key Words: Savings and Investment; Family Social Status; Education and Occupation; Trait Conscientiousness; Financial Assessment; Cross-sectional and Longitudinal

Introduction

Over the past thirty years there has been a rapprochement between psychology and economics (Lewis et al, 1995) with both disciplines taking an interest in each other's major variables. This study is concerned with individual difference (intelligence and ability), demographic (sex and education) as well as sociological (social class and occupation) and subjective ratings on financial status on individual savings (cash and investments).

There are a number studies scattered across many disciplinary journals that have considered psychological determinants of economic beliefs and behaviours (Buccioli & Zarri, 2017; Conlin et al., 2015; Durand, Newby, & Sanghani, 2008; Kasilingam, 2014; Mayfield, Perdue, & Wooten, 2008; Oehler, et al., 2018; Pak, & Mahmood, 2015; Rzeszutek, 2015; Shankar, & Kallarakal, 2018; Zagorsky, 2007). Many have shown that personality and ability variables are systematically directly related to saving and investment decisions as well as indirectly related to such things as education and occupation which are more strongly related to individual wealth and financial well-being. For instance, in a study using evidence from a large British follow-up study, Ashby, Schoon, and Webley, (2011) found that that socialization experiences during adolescence, as well as own social status and income, shape the savers that we become.

Various psychological studies have established the links between family background, early cognitive development and later educational and occupational outcomes (Deary et al., 2005; Feinstein & Bynner, 2004; Furnham & Cheng, 2017ab; Schoon, 2010; Spinath, et al., 2006; Tong et al., 2007). Data shows that intelligent people from higher social background are more likely to have higher educational qualifications attain higher occupational levels and in turn have higher earnings. Hence one would expect a direct and an indirect link from childhood intelligence to adult earnings.

Although many studies in the area are longitudinal, and there has been an established causal directions of these variables: education predicts occupation, intelligence predicts educational outcome, intelligence is associated with career success, and occupational prestige is associated with earnings (Breen, 2010; Deary et al., 2005; Erikson & Goldthorpe, 2010; Furnham, 2015; Geyer, Hemstrom, Peter & Vagero, 2006; Haveman & Smeeding, 2006; Heath, 1981; von Stumm

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et al., 2010). Few studies have looked at the effects of family background, childhood ability test scores, later educational and occupational outcomes on adult earning ability in relation to personality factors. Moreover, as Geyer et al. (2006) noted education, income and occupational class cannot be used interchangeably in social epidemiology; many studies in the area used occupation and income as indicators of a latent variable. This study will overcome the above-mentioned by using these measures separately.

Whilst there are a few early studies on personality traits and earning (Harrell, 1969) it was Bowles, Gintis and Osborne (2001) who concluded that non-cognitive traits are important in determining earnings that stimulated this field most. Early studies showed cultural differences in the relationship between personality and remuneration (Boudreau, Boswell & Judge, 2001). However, the studies have been inconsistent on which personality traits are measured (Groves, 2005; Palifka, 2009; Rode, Arthaud-Day, Mooney, Near & Baldwin, 2008; Spurk & Abele, 2011). Linz and Semykina (2009) concluded “the effect of personality is similar in magnitude to the effect of education, and may in fact exceed the effect of education if the effect of two personality traits are combined” (p. 71).

Psychological studies of work success (in general) using the established “Big Five” traits has concentrated on personality factors (Judge, 2009), physical characteristics (Judge & Cable, 2004; Judge, Hurst, & Simon, 2009), demographic variables like age, class and gender (Judge & Hurst, 2008) as well as intelligence (Schmidt & Hunter, 2004). Nearly all the studies in this area show that two personality traits namely Neuroticism (poor Emotional Adjustment) and Conscientiousness are by far the most important in explaining the variance of success at work measured by promotion, ratings, level and also pay (Sutin, Costa, Miech & Eaton, 2009). Whilst some studies have looked at the reciprocal effect of work experience on personality development (Roberts, Caspi & Moffitt, 2003), most have looked at personality predictors of job choice and success. Others have suggested that while personality may be a direct predictor of salary it is mediated by motivation and work status (Spurk & Abele, 2011).

The psychological studies examining ability and personality predictors of work success and adult earnings have typically three limitations: many are cross-sectional rather than longitudinal so that

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causality cannot be inferred; the samples tend to be small and non-representative of the total population; they tend to be very restricted in the variables measured in that they may measure personality but not also intelligence or education which may be powerful moderator or mediating factors. Further, some do not look at the role of education or indeed occupational attainment which are very obvious correlates of earnings and may be moderator or mediator variables. This study hopes to overcome these shortcomings.

There have been numerous studies on the possible causes of the established gender difference in pay which include gender differences in education, hours worked, occupational prestige, employment sector and years in the labour market (Haberfeld, 1992; Judge & Cable, 2012; Judge & Livingstone, 2008). Semykina and Linz (2007) found gender differences in personality traits which explained 8% of the gender wage gap. They also found women's earnings are strongly affected by personality while the effect of personality on men's earnings was small and often not significant".

Hypotheses

This study explores the effects of family social background, childhood intelligence, education and occupation, and personality traits on adult savings and investment, using path model and drawing on data collected from a large representative population sample born in 1958 in the UK.

On the basis of the literature reviewed above it is hypothesised that H1) Parental social class would be significantly and positively associated with adult savings and investment; H2) Education and occupation would be significantly and positively associated with adult saving and investment; H3) Traits Emotional stability, Conscientiousness and Openness would be significantly associated with adult savings and investment; H4) Personal Financial assessment (subjective ratings of economic well-being) would be significantly associated with adult savings and investment; H5) Women may have less savings and investment than men; H6) Parental social class, education and occupation, personality traits, financial assessment and gender might be independent predictors of the outcome variable.

Method

Participants

The National Child Development Study 1958 is a large-scale longitudinal study of the 17,415 individuals who were born in Great Britain in a week in March 1958 (Ferri, Bynner, & Wadsworth, 2003). 14,134 children at age 11 completed tests of cognitive ability (response = 87%). Testing took place in school, and written, informed consent was given by the parents. At 33 years, 11,141 participants provided information on their educational qualifications obtained (response = 72%). At age 50 years, 8,210 participants provided information on their current occupational levels (response = 67%); 9,790 participants completed a questionnaire on personality (response = 79%); 9,762 participants provided information on their self-assessed financial situation (response = 79%), 9,729 participants provided information on their savings and investment (response = 57%). The analytic sample comprises 5,766 cohort members (50 per cent females) for whom complete data were collected at birth, at ages 11 years, and the outcome measure at age 50 years. Bias due to attrition of the sample during childhood has been shown to be minimal (Davie, Butler, & Goldstein, 1972; Fogelman, 1976).

Measures

1. *Family Social Background at Birth* Family social background includes information on parental social class and parental education. Parental social class at birth was measured by the Registrar General's measure of social class (RGSC). RGSC is defined according to occupational status (Marsh, 1986). Where the father was absent, the social class (RGSC) of the mother's father was used. RGSC was coded on a 6-point scale: I professional; II managerial/technical; IIIN skilled non-manual; IIIM skilled manual; IV semi-skilled; and V unskilled occupations (Leete & Fox, 1977). Parental education is measured by the age parents had left their full-time education.
2. *Childhood Intelligence* Childhood intelligence was assessed at age 11 in school using a general ability test (Douglas, 1964) consisting of 40 verbal and 40 non-verbal items. For the verbal items, children were presented with an example set of four words that were linked either logically, semantically, or phonologically. For the non-verbal tasks, shapes or symbols were used. The children were then given another set of three words or shapes or symbols with a blank. Participants were required to select the missing item from a list of five alternatives. Scores from these two set of tests correlate strongly with scores on an IQ-

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type test used for secondary school selection ($r=0.93$, Douglas, 1964) suggesting a high degree of validity.

3. *Educational Qualifications* At age 33, participants were asked about their highest academic or vocational qualifications. Responses are coded to the six-point scale of National Vocational Qualifications levels (NVQ) ranging from 'none' to 'higher degree level': 0 = no qualifications; 1 = some qualifications [Certificate of Secondary Education Grades 2 to 5]; 2 = O level [equivalent to qualifications taken at the end of compulsory schooling]; 3 = A level [equivalent to university entrance level qualifications]; 4 = postsecondary degree/diploma and equivalent; and 5 = higher post-graduate degrees and equivalent.
4. *Personality Traits* Personality traits were assessed at age 50, by the 50 questions from the International Personality Item Pool (IPIP) (Goldberg, 1999). Responses (5-point, from "Strongly Agree" to "Strongly Disagree") are summed to provide scores on the so called 'Big-5' personality traits: Extraversion, Emotionality/neuroticism, Conscientiousness, Agreeableness and Openness. Scores on each trait range between 5 and 50 with higher scores equating to higher levels of each trait, of which 10 items for each trait. A preliminary test showed that the associations between traits Extraversion and Agreeableness were not significantly associated with adult savings and investment, thus these two traits were excluded from the following analyses. Alpha was 0.88 for emotionality/neuroticism, 0.77 for conscientiousness, and 0.79 for intellect/openness.
5. *Occupational Prestige* Data on current or last occupation held by cohort members at age 50 are coded according to the RGSC described above, using a 6-point classification.
6. *Financial Assessment* was assessed at age 50. Participants were asked to assess their personal financial situation on a 5-point measure (1= Finding it very difficult, 2 = Finding it quite difficult, 3 = Just about getting by, 4 = Doing all right, 5 = Living comfortably).
7. *Adult Savings and Investment* At age 50, participants provided information on the amount of savings and investment they had, which were logged in the following analyses. In addition, participants also mentioned the specific types of their savings and investment, of which bank or building society=70.2%, ISA=51.8%, premium bonds=35.0%, stocks and/or other shares=32.9%.

Statistical Analyses

First, we look at the associations between the measures used in the study using IBM SPSS Statistics 24. Second, we will conduct structural equation modelling to examine the paths linking parental social class, childhood intelligence, personality traits, education and occupation, and finance assessment and adult savings and investment using IBM SPSS Amos 24.

Results

Correlational Analysis

Table 1 shows the correlations between the observed variables in the study, together with the means and standard deviations of the measures by gender. Results show that all variables examined were significantly associated with the adult savings and investment in the expected direction ($p < .001$). The strongest association was between personal financial assessment and adult savings and investment, followed by education and occupation. This is a well established finding. However what was particularly interesting was the correlation between IQ measured as age 11 and savings measured 39 years later. In effect all the hypotheses were supported.

Structural Equation Modelling

Structural Equation Modelling (SEM) was used to assess the links among gender, family social status, childhood intelligence, education and occupation, personality traits, financial assessment, and savings and investment in adulthood. Paths in the models are designed to correspond with the time sequence in which the variables occurred, as well as following the rationale that more “stable” variables predict more “changeable” variables. The SEM model testing was carried out using the structural equation modelling program AMOS 18 (Arbuckle, 2009) with maximum likelihood estimation that can be based on incomplete data, known as the full information maximum likelihood (FIML) approach (Arbuckle, 1996).

Figure 1 shows the standardised path coefficients of the structural equation model. The solid lines indicate that the corresponding path coefficients are statistically significant and dashed lines indicate that the path coefficients are non-significant. Indicators of latent variables and error variance for each observable and latent variables are included in the model (not shown in the diagram).

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Model Fit

The χ^2 statistic is overly sensitive when sample sizes are large or the observed variables are non-normally distributed. The root mean square error of approximation (RMSEA) gives a measure of the discrepancy in fit per degrees of freedom (<.05 indicates a good fit). The final index of choices are the Comparative Fit Index (CFI), and the Tucker Lewis Index (or Non-normed Fit Index) where values above .95 indicate a very good fit, and values > .90 are interpreted as good (Bentler, 1990).

Insert Figure 1 about here

Table 2 shows unstandardized estimate, standard error, and standardised estimate of each indicator of the latent variables and the predictors of the outcome variable for the complete SEM model. For the latent variable of family social status, the loading ranged from .62 to .77. For childhood intelligence, they were .91 for verbal test and .86 for non-verbal test, indicating the coherence of the underlying construct for each latent variable.

The model showed a good fit. Chi-square was 574.6 ($df = 40, p < .001$), the CFI was .964, the TLI was .917, and the RMSEA was .047. The model explains 26 per cent of the total variance. Figure 1 shows that parental social status, educational qualifications and occupational prestige, trait conscientiousness, and financial assessment as well as gender all had direct and significant effects on adult savings and investment. Cohort members whose parents had higher social status, who had higher educational qualifications and were in more professional positions and had better financial situation tended to have more savings and investment than those who scored lower on these measures. Women tended to have less savings and investment than men. Thus H6) parental social class, education and occupation, personality traits, financial assessment and gender might be independent predictors of the outcome variable was partially supported. For among the three personality traits included in the model, only conscientiousness had the significant effect on the outcome variable.

Discussion

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The present study explored the associations between a set of psychological and socio-demographic factors and adult savings and investment. The findings of the current study confirmed, and extended previous psychological and sociological work in this area (Ashby et al., 2011; Furnham & Cheng, 2013). We were particularly interested in the personality trait data albeit that it was cross-sectional data whereas the sociological variables and IQ were longitudinal. The correlation results showed that three personality traits (Emotional stability, Conscientiousness and Openness) are linked with savings and investment in adulthood. These traits have been implicated in many studies of personality and monetary behaviour (Furnham, 2015).

The highest correlation was with Conscientiousness which the direct effect on adult savings and investment in the SEM model shown in Figure 1, though the effect is modest. Conscientiousness is associated with being hard-working, reliable and planful. It is also associated with postponement of gratification which is what essentially saving, in any form is about. Indeed in a recent longitudinal study of delay of gratification Furnham and Cheng (2019) showed it was the strongest predictor of the Big Five. Indeed, it seems that of personality traits Conscientiousness is the strongest correlated of health, wealth and happiness

It is not surprising that the strongest predictor of saving and investment was the simple subjective rating of financial assessment, followed by educational qualifications and occupational prestige, which were inter-related. It suggested that people know what their financial status is and are accurate assessors. It is also no surprise that education related to occupational prestige which is a strong marker of income.

Of particular interest to differential psychologists was the SEM results which showed that childhood intelligence had a strong influence on educational qualifications (path coefficient=.40), which in turn, significantly predicted occupational prestige (path coefficient=.33) and financial assessment (path coefficient=.09), and consequently influenced adult savings and investment. This supports the extensive work of Deary on the role of intelligence in so many important life outcomes (Deary et al., 2005).

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Further, gender was a significant positive predictor of Conscientiousness and a negative predictor of Emotional stability. Previous research in the area consistently show that women have higher scores on Neuroticism and depression compared with men, which can significantly effect many aspects of their work performance. On the other hand, women tend to be more prudent and cautious and hard-working but this mediated path was not a strong as the direct path to savings

This study is among the first ones to look at adult savings and investment with family social background, childhood intelligence, education and occupation, together with personality factors. As with all research using cohort studies, this work is constrained by the availability of the data. In the current study personality traits were only measured once, at the same time as the savings and investment at age 50 years. Ideally, personality should be assessed earlier, at late teen, and again in later years, so that the effects of personality on the outcome variable could be better explored. Although a quarter of the total variance of savings and investment is accounted for, there are still three quarters of variance unexplained. Further studies may explore more the causal directions of intelligence, personality factors, social factors, behaviours and beliefs on savings and investment.

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Table 1. Pearson correlations among gender, parental social status measures, childhood intelligence, personality traits, educational qualifications and occupational prestige, financial situation, and adult saving behaviour.

Variables	Mean SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Logged amount of savings at age 50	3.78 (1.29)	—												
2. Gender	.50 (.50)	-.078***	—											
3. Parental social class at birth	3.33 (1.24)	.130***	-.019	—										
4. Paternal education at birth	15.54 (2.00)	.108***	.002	.472***	—									
5. Maternal education at birth	15.53 (1.59)	.089***	.028	.354***	.508***	—								
6. Verbal score Age 11	24.63 (8.50)	.152***	.126***	.243***	.227***	.203***	—							
7. Non-verbal score age 11	23.00 (6.86)	.154***	.020	.251***	.229***	.193***	.774***	—						
8. Educational qualifications age 33	2.69 (1.45)	.267***	-.081***	.326***	.313***	.278***	.461***	.450***	—					
9. Current occupational levels age 50	4.11 (1.20)	.335***	-.013***	.213***	.182***	.164***	.316***	.298***	.456***	—				
10. Financial assessment age 50	4.12 (.94)	.463***	.000	.063***	.045**	.043*	.106***	.096*	.167***	.183***	—			
11. Emotional stability age 50	28.93 (7.07)	.093***	-.138***	.026	.025	.016	.064***	.106***	.087***	.075***	.144***	—		
12. Conscientiousness age 50	33.99 (5.27)	.110***	.106***	.015	.000	.118***	.050**	.031*	.068***	.089***	.159***	.181***	—	
13. Openness age 50	32.55 (5.17)	.079***	-.012	.140***	.159***	.140***	.279***	.238***	.321***	.245***	.076***	.096***	.226***	—

Note: * $p < .05$; ** $p < .01$; *** $p < .001$. Variables were scored such that a higher score indicated being female, higher amount of savings, a more professional occupation for the parent and higher age parents left school, higher verbal and non-verbal ability test scores in childhood, highest educational qualification and a more professional occupation; better financial situation, higher scores on emotional stability, conscientiousness and openness. Bold coefficients indicate the associations between the outcome variable and other variables examined in the study.

Factors influencing adult savings and investment

Table 2. Unstandardized estimate, standard error and standardised estimate of the latent and observable variables of SEM that predict adult savings and investment.

<i>Variables</i>	Unstandardized estimate	Standard error	Standardised estimate
<i>Parental social status</i>			
RGSC	1.000		.623
Father's education	2.001	.062***	.770
Mather's education	1.309	.042***	.634
<i>Childhood cognitive ability tests</i>			
Verbal scores	1.000		.907
Non-verbal scores	.761	.014***	.855
<i>Predicting adult savings and investment</i>			
Gender	-.166	.033***	-.064
Parental social status (latent)	.082	.032**	.049
Childhood cognitive abilities (latent)	.005	.003	.029
Educational qualifications	.118	.015***	.133
Occupational levels	.092	.016***	.086
Financial assessment	.570	.018***	.417
Emotional stability	.001	.002	-.002
Conscientiousness	.101	.003***	.046
Openness	-.012	.004	-.027

Note: ** $p < .01$; *** $p < .001$.

Factors influencing adult savings and investment

Figure 1. Path model predicting adult savings and investment.

