



The social influences on trait Conscientiousness: Findings from a nationally representative sample



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ABSTRACT

This study examined the associations between childhood intelligence, social and demographic variables and trait Conscientiousness in a large nationally representative sample. 5128 participants provided information on family social background measured at birth, childhood intelligence assessed at 11 years, educational qualifications obtained at 33 years, occupational levels at 42 years, and personality trait Conscientiousness measured at 50 years. Results showed that parental social status, childhood intelligence, education, occupation were all modestly, but significantly, associated with adult trait Conscientiousness. Structural equation modelling showed that after entering education and occupation, the effects of childhood factors, family social status and intelligence on adult trait Conscientiousness ceased to be significant. This study demonstrated a significant, but very small positive association between intelligence, social factors and Conscientiousness. Gender was also significantly associated with Conscientiousness. Limitations are acknowledged.

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1. Introduction

This study concerns the correlates of one of the Big Five personality traits, Conscientiousness. Of the five traits, it seems that it is Neuroticism and Conscientiousness are most powerful and consistent markers of a range of social outcome variables such as education, health and work success (Furnham, 2008; O'Connor & Paunonen, 2007; Poropat, 2009). There have been studies that have attempted to identify biological markers of both traits (Sutin et al., 2010).

Whilst most studies in this area have seen Conscientiousness as an independent variable related to educational, health and occupational outcome, this study considers it as a dependent variable (Bogg & Roberts, 2013). Although behavioural genetic studies have established about 50% of the variance in personality traits could be explained by genetic influences; this itself shows that about 50% of the variance would due to environmental factors (Plomin, DeFries, Knopik, & Neiderhiser, 2013). The question is what are the early childhood markers of adult Conscientiousness and what evidence is there that it can be taught or changed.

Trait Conscientiousness is associated with being efficient, organised, reliable and responsible. People high in Conscientiousness

have been shown to be achievement oriented, competent, dependable and productive. Facets of the NEO-PI-R scale include dutifulness, deliberation and self-discipline (Costa & McCrae, 1992). It is not surprising therefore that parents, teachers and employers value the trait and attempt to shape and encourage it in their children, students and employees (Howard & Howard, 2001). Indeed King, Nettle, and Robins (2012) demonstrated that students who were more Conscientious earned university grades higher than their intelligence scores would predict.

There are consistent findings from correlational studies that show the small but significant positive, association between Conscientiousness and educational achievement and occupational prestige (Furnham, 2008). O'Connor and Paunonen (2007) in a meta-analysis examining 23 correlations with an *N* of 5878 found a corrected correlation of $r = .24$, whilst Poropat (2009) found a correlation of $r = .22$ examining 138 studies and using an *N* = 70,926. There is also some evidence to suggest sex differences in Conscientiousness which has been used to explain why females outperform males in school grades despite the evidence of very small differences in intelligence between the genders (Furnham, 2008).

Many studies currently exist including those looking at the psychometric properties of different measures of trait Conscientiousness (MacCann, Duckworth, & Roberts, 2009), as well behavioural correlates of the trait (Jackson et al., 2010). Some have focused specifically on educational (Von Stumm, Hell, & Chamorro-Premuzic,

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2011) as well as health correlates of Conscientiousness (Friedman et al., 1993; Roberts, Smith, Jackson, & Edmonds, 2009).

One area of research of relevance to this paper are the various studies on the relationship between Conscientiousness and intelligence. Whilst not all studies have found a significant relationship, those that have found a significant *negative* relationship (Moutafi, Furnham, & Crump, 2003; Moutafi, Furnham, & Paltiel, 2004; Wood & Englert, 2009). These results were surprising given that many other studies had shown that both Conscientiousness and Intelligence were positive and significant predictors of educational and work outcomes. Based on Cattell's (1987) investment theory researchers have tried to explain the results in terms of Intelligence Compensation Theory: that is, less intelligent people have to work harder to achieve the same results as more intelligent people in a similar competitive educational or work environments. Less intelligent people have to *become more Conscientious* (hard-working, planful, organised) to achieve the same ends as more intelligent people. However it is also possible that more intelligence people realise the importance of becoming Conscientious to achieve many life goals like good education and a well-paid job, yet the correlation often shows that this is clearly not the case. Both suggest however, that Conscientiousness may change over time.

Because it is recognised as a desirable characteristic various attempts are made to socialise it by parents and teacher. Studies on the Protestant Work Ethic (PWE), which is closely correlated with Conscientiousness, emphasise the role of parental socialisation, as well as schooling and work experience on the development of Conscientiousness (Furnham, 1996). Middle class parents stress postponement of gratification and the importance of educational achievements which help shape and strengthen the PWE which in turn relates to economic success.

There have been studies that have attempted to understand the (natural) change in Conscientiousness over time. In a meta-analysis of 92 samples Roberts, Walton, and Vietchtbauer (2006) noted a steady rise in Conscientiousness over time from age 20 to over 70 years old. The same pattern was found by Soto, John, Gosling, and Potter (2011) who tested over a million and a quarter people in a web-based study. Both studies used cross-sectional data to infer changes over time which could reflect as much a cohort effect as the result of change. They could also be interpreted to show that Conscientiousness, like other personality traits, change relative little over time.

However nearly all the studies in this area have two limitations: first, they have been restricted to students or senior managers who are not representative of the population and who work in a highly competitive environment (Furnham, 2008). Most will have IQs between one and two standard deviations above the norm and indeed have been selected in part for their ability. There appear to be few studies of the general population. Second, all the studies have been cross-sectional and hence correlational (Roberts et al., 2006; Soto et al., 2011). Thus it is not clear whether intelligence influences Conscientiousness or vice versa.

This study analyses the data from a longitudinal data base. Following from the above four hypotheses were tested. (H:1) Childhood intelligence would be significantly and positively correlated with Conscientiousness. Studies that found negative correlations between intelligence and Conscientiousness were all based on cross-sectional data using students in competitive environments. It is suggested that in a general population the correlation would be positive because brighter people tend to be more ambitious and achievement oriented (Furnham, 2008); (H:2) Educational qualifications would be significantly and positively associated with Conscientiousness as it takes higher degrees of the latter (along with ability) to achieve the former; (H:3) Occupational levels would be significantly and positively

associated with Conscientiousness, for the same reason as the relationship between educational achievement and Conscientiousness; (H:4) People from higher SES backgrounds would have a higher Conscientiousness score in adulthood as SES is related to Protestant Work Ethic beliefs and parental socialisation into the virtues of hard work, postponement of gratification and achievement orientation (H:5). Intelligence, gender, education, and occupation would be independently associated with Conscientiousness.

2. Method

2.1. 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, 11,142 participants provided information on their educational qualifications obtained (response = 72%), and at 42 years 9592 participants provided information on their occupational levels (response = 62%). At 50 years, 8532 participants completed a questionnaire on personality trait Conscientiousness (response = 69%). The analytic sample comprises 5128 cohort members (52 per cent females) for whom complete data were collected at birth, at 11 years, and the outcome measure at 50 years. Bias due to attrition of the sample during childhood has been shown to be minimal (Davie, Butler, & Goldstein, 1972; Fogelman, 1976).

2.2. Measures

Childhood factors: 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). Scores were reversed in the following analyses. Parental education is measured by the age parents had left their full-time education. 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. Factors in adulthood: At 33 years, 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 'university degree or equivalent'. At 42 years participants provided information on their occupational levels which are coded according to the RGSC described above, using a 6-point classification. Personality trait Conscientiousness was assessed at 50 years, from the International Personality Item Pool (IPIP) (Goldberg, 1999). Cronbach's alpha coefficient was 0.78.

3. Results

3.1. Correlational analysis

Table 1 shows the correlations between the observed variables in the study, together with the means and standard deviations of the measures. The associations between trait Conscientiousness and other variables measured in the study (in boldness) were all significant ($p < .05$ to $p < .001$). In particular, childhood intelligence (both verbal and non-verbal) was significantly and positively

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