



Factors affecting adult trait Neuroticism in a nationally representative sample



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A B S T R A C T

This study explores factors in childhood and adulthood that affect adult trait Neuroticism in a large, nationally representative sample. 5785 participants provided information on family social background measured at birth; Intelligence assessed at 11 years; Behavioural problems measured at 11 years; Malaise assessed at 23 years; Educational qualifications obtained at 33 years; Occupational levels at 42 years, and personality trait Neuroticism measured at 50 years.

Structural equation modelling showed that sex, childhood Behavioural Problems, childhood Intelligence, Malaise in early adulthood, and Occupation were all significant and independent predictors of adult trait Neuroticism. Parental social status was significantly and negatively associated with Malaise at age 23, but was not a significant predictor of trait Neuroticism at age 50 years. Education predicted Neuroticism mainly through occupation. The strongest predictor of trait Neuroticism at 50 years was Malaise measured at 23 years, with a corrected correlation of $r = .42$ over the 27 year period. The results suggest some underlying biological/genetic mechanism.

1. Introduction

This study explores factors in childhood and early adulthood that may affect adult mid-life trait Neuroticism. Neuroticism is perhaps the most powerful, Big-Five personality trait predictor of mental well-being (Argyle, 2001), physical health (Sutin et al., 2010; Hampson et al., 2015), and work success (Cheng and Furnham, 2012), though there is both test-item and conceptual overlap between these measures and concepts which may, in part, explain the relationship. A few studies have examined the determinants of Neuroticism or its stability over time (Edmonds et al., 2013; Furnham and Cheng, 2015) though there are some important recent reviews of the current state of knowledge of the concept (Ormel et al., 2013).

1.1. The stability of personality

There have been many studies that examine the stability of psychological characteristics over time such as aggression (Huesmann et al., 1984) and intelligence (Deary et al., 2000). The issues are about both mean level change (reliability) and rank order stability over longer periods of time. The debate about the equivocal nature of both findings

and conclusions. Debate revolves around a number of issues such as the reliability and validity of personality tests used (to account in part for measurement error); the moderator variables considered (like sex, education and ethnicity); the age at which people are measured (i.e. adolescents, adults, old age); the time span that shows most change and stability; how change is measured (such as mean level change, rank order, ipsative change); the stability of the environments of people and what, if anything leads to empirically demonstrated real change (Srivastava et al., 2003; Roberts et al., 2006).

There has therefore been a longstanding debate called the *plaster vs plasticity* debate where the former advocates argue that personality is set like plaster early in life (after adolescents, and certainly before 30 years) while those who support the plasticity model stress how much and how often personality changes over time (Helson et al., 2002; Lucas and Donnellan, 2011). From these studies it may be possible to draw the following conclusions: Personality seems most stable between the ages of 50 and 60 years particularly using established Big Five measures to assess it. Next, there are modest increases in Emotional Stability (low Neuroticism) and Agreeableness over this period with Extraversion and Openness showing least change (both with a slight decline) and Conscientiousness showing most change (an increase). Third, males seem

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both more stable over time and more emotionally stable (i.e. less neurotic) than females (Roberts et al., 2001, 2006).

There are also many studies on the test-retest reliability of personality traits, over periods of time. For instance the test-retest reliability of the Neuroticism measure from the Big Five reported $r = .87$ over three months and $r = .83$ over 6 years, though for other related measures it is lower in the region of $r = .70$ depending on the instrument and the population group (McCrae and Costa, 2010). One study that looked at the test-retest reliability of Malaise on three occasions measured two years apart on a sample of over 1000 New Zealand adults, showed correlations of between $r = .58$ and $r = .63$ (McGee et al., 1986). It is therefore essential to take into account the reliability of the instruments when testing the stability of personality over time.

1.2. This study

In this study Neuroticism measured at 50 years is the major variable of interest. Previous studies have established the links between family social status at birth and childhood intelligence, as well as later educational and occupational achievement (Feinstein and Bynner, 2004; Deary et al., 2005; Spinath et al., 2006; Schoon, 2010; Furnham and Cheng, 2013, 2016), and between family social background and occupational attainment (Duncan et al., 1972; Duncan and Brooks-Gunn, 1997) and health (Wilkinson and Pickett, 2006).

This study set out to explore factors in childhood and adulthood that affect adult trait Neuroticism using a longitudinal, nationally representative sample in the UK. In particular, it examines the effects of parental social class, childhood behavioural problems and intelligence, malaise, education, and occupation on adult trait Neuroticism, taking account the effect of sex on the outcome. Neuroticism in this data set was not measured until the age of 50 years but we do have measures of Malaise at 23 years. However it should be noted that any demonstrated relationship between the variables may be the result of genetic factors. Thus any link between childhood behaviour problems, early-adult malaise and late-adulthood Neuroticism may be the result of common genetic factors.

There are a number of measures and concepts which are clearly related and overlapping: fatigue, negative affectivity, neuroticism, malaise, minor psychiatric morbidity. Some writers have tried to draw some distinctions between the two concepts. Thus Charlton (2009) saw Neuroticism as relating more to anxiety and emotional instability and malaise to fatigue and physical symptoms. Certainly the Malaise inventory items are much more related to physical conditions such as headache, backache, stomach upsets, eye pain and rheumatism though it does contain a number of items similar to traditional measures of Neuroticism such as: "Do you often feel depressed?" Indeed it has been shown that it measures both Psychological and Physical Malaise (Grant et al., 1990). Malaise may be seen as a measure of minor psychiatric morbidity and stress, while Neuroticism is more a measure of trait negative affectivity and emotional instability.

Based on the past literature and the data bank we are using we tested six hypotheses:

H1. Childhood behavioural problems (positively) and childhood intelligence (negatively) would be significantly associated with adult trait Neuroticism (and malaise). There is much evidence in the clinical literature to suggest adult Neuroticism can be traced back to early life (Bowlby, 1988; Furnham and Cheng, 2015).

H2. Sex would be significantly and positively associated with both Malaise and trait Neuroticism. All tests that measure Neuroticism and its correlates suggest that females score higher than males (McCrae and Costa, 2010).

H3. Family socio-economic conditions would be significantly associated with Malaise measured at 23 years. This is based on the idea that people in poorer families have greater stress and lower social stability which

increases chances of Malaise (Power and Manor, 1992; Stansfeld et al., 2011).

H4. Educational qualifications would be significantly and negatively associated with trait Neuroticism. This is based on the literature which suggested that there is a negative correlation between Neuroticism and exam and work success (Slaughter and Kausel, 2009).

H5. Occupational levels would be significantly and negatively associated with trait Neuroticism. This is based on the literature on personality correlates of occupational success which suggests that Neuroticism is consistently negatively, and Conscientiousness positively related to multiple measures of success like salary, speed of promotion and organisational level reached (Furnham et al., 2013).

H6. Malaise, measured at 23 year would be the most significant predictor trait Neuroticism measured at 50 years. This is based on the stability of personality over time, referenced above.

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 et al., 2003). 12,409 mothers completed a questionnaire of children's behavioural problems when participants were at age 11 (response = 76%). 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 23 year, 12,384 participants completed questionnaire of malaise (response = 76%). 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 Neuroticism (response = 69%). The attrition rate is normal for this sort of study. The analytic sample for this analysis comprised 5785 cohort members (49% females) for whom there was a complete data set of the variables we examined. Bias due to attrition of the sample during childhood has been shown to be minimal and not problematic (Davie et al., 1972; Fogelman, 1976) though over time this may have increased.

2.2. Measures

1. Parental Social Class. Parental social class at birth was measured by the Registrar General's measure of social class (RGSC). RGSC is defined according to occupational status (Leete and Fox, 1977; 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 (numbers in brackets represent percentages in this study: I professional (6.1%); II managerial/technical (40.5%); IIIN skilled non-manual (22.0%); IIIM skilled manual (17.0%); IV semi-skilled (12.3%); and V unskilled (2.1%) occupations).
2. Parental education is measured by the age parents had left their full-time education.
3. Childhood Cognitive Ability. Childhood cognitive ability 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-type test used for secondary school selection ($r = .93$) suggesting a high degree of

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