



# Conscientiousness and occupational prestige as independent predictors of the change of tobacco use in adulthood

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## ABSTRACT

This study investigated the association between childhood intelligence, personality traits, parental social class, maternal smoking, educational qualifications and occupation prestige, and smoking status assessed at different ages. The study was based on a British birth cohort with nine follow-ups. At age 54 years, cohort members provided information on current tobacco use (Yes/No) and the frequency of daily cigarettes smoking. Response of the same questions was also collected four years earlier, at age 50 years. Results showed that among the 5316 participants with complete data, there was a significant ( $p < 0.001$ ) decrease in the rates of current tobacco use from age 50 to age 54 years (17.9% and 15.0%). Logistic regression analyses showed that, whilst educational qualifications, occupational prestige, and three of the Big-Five personality traits (Extraversion, Conscientiousness, and Openness) were all significant predictors of current smoking status at age 54 years. After controlling for the initial smoking status, measured four years earlier, only trait Conscientiousness and occupational prestige were significant and independent predictors of the outcome variable. Low intelligence predicted smoking status > 39 years later, mediated by educational qualifications. Implications and limitations are noted.

## 1. Introduction

What predicts those adults who do, and do not, give up smoking in late middle age? Most smokers reporting wanting to, and often having many failed attempts at, giving up smoking but some succeed while others fail (Slovic, 2001). Many health institutions are extremely interested in this issue as they are eager to help people “kick the habit”. This study examines personality, intelligence, social class and educational qualification correlates of adult smoking in a longitudinal study. We were particularly interested in correlates of those who gave up smoking in middle age.

### 1.1. Personality and smoking

Various studies that have looked at personality trait correlates of health and illness as well as tobacco usage, though few, have looked at personality correlates of stopping nicotine consumption. Most previous research in the area has established Conscientiousness as a protective factor of health conditions and as a predictor of longevity (Friedman & Kern, 2014).

Bogg and Roberts (2004), in a review of 194 studies, found that

Conscientiousness-related traits were negatively related to *all* risky health-related behaviours and positively related to *all* beneficial health-related behaviours. They found a correlation of  $r = -0.14$  between tobacco use and health related behaviours while correlations between ever-smoked, quality and frequency and health behaviours were very similar. They also showed that two facets of trait Conscientiousness, namely industriousness and self-control, were both equally highly correlated with tobacco use ( $r = -0.21$ ). While it may be expected that Conscientiousness is correlated with never having smoked it also probably correlates with giving up smoking in later life. We will examine this hypothesis in this study.

Looking specifically at smoking status in a meta-analysis based on 25 studies, Munafò, Zetteler, and Clark (2007) reviewed 25 studies and found a significant difference between smokers and non-smokers on both Extraversion and Neuroticism traits. Terracciano, Lockenhoff, Crum, Bienvu, and Costa (2008) found that compared to never smokers, current cigarette smokers scored lower on Conscientiousness and higher on Neuroticism. Campbell, Henry, Hammelman, and Pignatore (2014) however found that smokers had significantly higher qualities of Openness to Experience and a lower levels of Conscientiousness.

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There have been speculations on the mechanisms that explain the relationship between childhood personality and adult health status. Hampson, Goldberg, Vogt, and Dubanoski (2007) showed how children's personality traits have enduring effects that shape adult health and well-being. Specifically, childhood Conscientiousness appears to influence core aspects of adult well-being: health, friendships, and mastery all of which are inter-related.

In a longitudinal study Zvolensky, Taha, Bono, and Goodwin (2015) found higher levels of Openness and Neuroticism were associated with increased risk of any lifetime cigarette use. Neuroticism also was associated with increased risk of progression from ever-smoking to daily smoking and persistent daily smoking. Conscientiousness was associated with decreased risk of lifetime cigarette use, progression to daily smoking, and smoking persistence. These associations between smoking and personality persisted after adjusting for demographic characteristics, depression, anxiety disorders, and substance use problems.

In another longitudinal study based on approximately 4000 adults aged 25–74 who participated in two waves of the Midlife in the US (MIDUS) study, Turiano, Whiteman, Hampson, Roberts, and Mroczek (2012) examined how personality change and the multiplicative effects among personality traits relate to substance use. They found that higher levels of Neuroticism, Extraversion, Openness, and lower levels of Conscientiousness and Agreeableness predicted longitudinal substance use. Further, increases in Neuroticism and Openness predicted increased substance use while increases in Conscientiousness and Agreeableness predicted decreased substance use.

In an important, recent and comprehensive meta-analysis Hakulinen et al. (2015) looked at nine cohort studies that included 79, 575 adults. They looked personality correlates of smoking status: being a current, ex- or non-smoker, as well as smoking cessation, initiation and relapse. They found that current smoking was associated with higher Extraversion and Neuroticism but lower Conscientiousness. Among the nonsmokers, smoking initiation during the follow-up period was prospectively predicted by higher Extraversion and lower Conscientiousness. Also, higher Neuroticism predicted smoking relapse among ex-smokers. For the smokers, smoking cessation was negatively associated with Neuroticism. They also found that socio-demographic variables did not modify the associations between personality and smoking. Thus, this review highly the role of Neuroticism more than the other big five factors in smoking initiation and cessation.

Overall the personality and smoking literature has revealed somewhat consistent findings showing that those high on Extraversion, Openness and Neuroticism, but low on Agreeableness and Conscientiousness tend to have greatest experience of tobacco usage. Many studies have not taken into consideration other individual difference and demographic factors which could act as moderating or mediating factors, such as intelligence. Through logistic regressions this study looks at the relative effect sizes of personality over other salient variables in explaining smoking behaviour. It should be noted however that effect sizes rather than significant effects tend to be more indicative when sample are large.

Because of the power and consistency of previous results it was predicted that Conscientiousness and Neuroticism would be associated with stopping smoking.

## 1.2. Social class

The link between socio-economic conditions and health outcomes has been well documented (Marmot, 2007; Wilkinson & Pickett, 2006). According to the British Government Office of National Statistics long-term smokers bear the heaviest burden of morbidity and mortality related to their smoking habit. Further they are disproportionately drawn from lower socio-economic groups. People in poorer social groups who smoke, start to smoke at an earlier age.

There is also evidence that smoking is associated with education and intelligence. Gottfredson and Deary (2004) have argued that

intelligence is a strong predictor of educational outcome which is related to occupational attainment, the measure of social class. Further, more intelligence people tend to lead healthier lives by their lifestyle choices but also have better, less stressful jobs, in healthier work environments. Childhood intelligence is also linked to health outcomes such as coronary heart disease and stroke risk in adulthood (Batty, Mortensen, Nybo Andersen, & Osler, 2005).

In examining the association between childhood cognitive ability, smoking behaviour and socio-economic conditions on premature adult mortality in a British post war birth cohort Kuh et al. (2009) found that poor childhood and adult socio-economic conditions, lower childhood cognitive ability and cigarette smoking are all associated with adult mortality risk.

## 1.3. The present study

The aim of this study was two-fold. First, we examined whether psychological factors (intelligence and personality) not only associated with, but also the independent predictors of, smoking cessation, in a large birth cohort in the Great Britain. It examined both intelligence and personality (whereas most studies in the area looked at one or the other): it is important to examine the independent effects of these factors on the health outcomes such as tobacco use behaviours. Second, whether personality traits predict the change of tobacco use. We also examined demographic factors like parental social class, educational qualifications and occupation prestige which are modestly inter-correlated.

The hypotheses are based on previous research. It is hypothesised that individuals with higher scores on Extraversion (H1) and Neuroticism (H2), and lower scores on Conscientiousness (H3) with less intelligent (H4) less education (H5) with lower occupation (H6) were significantly associated with smoking behaviour in middle age. Further, traits Extraversion, Neuroticism and Conscientiousness, childhood intelligence, educational qualifications and occupation prestige would be significant and independent predictors of the change (cessation) of current smoking status (H7).

## 2. Method

### 2.1. Participants

The study draws on the National Child Development Study 1958 (NCDS) which is a large-scale longitudinal study. NCDS comprises 17,415 individuals who were born in Great Britain in a week in March 1958 (Ferri, Bynner, & Wadsworth, 2003). The following analysis is based on data collected at birth, at age 11, 33, 50 and 54 years. The analytic sample comprises 5316 cohort members (50.6% females) with complete data. Analysis of response bias in the cohort data showed that the achieved adult samples did not differ from their target sample across a number of critical variables (social class, parental education and gender), despite a slight under-representation of the most disadvantaged groups (Plewis, Calderwood, Hawkes, & Nathan, 2004). The focus of the paper was on the data collected when participants were aged 50 and 54 which could be considered a “niche” age spectrum though there is no reason to expect results unrepresentative of participants at other ages.

### 2.2. Measures

#### 2.2.1. Parental social class at birth

Parental social class at birth was measured by the Registrar General's measure of social class (RGSC). RGSC is defined according to occupational prestige (Marsh, 1986). 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). This can be treated as either a continuous or a discrete

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