Emotional stability, conscientiousness, and self-reported hypertension in adulthood

Helen Cheng[1] Scott Montgomery[2,3] Luke Treglown[1] & Adrian Furnham[1,4]

[1] *Research Department of Clinical, Educational and Health Psychology, University College London, London WC1E 6BT, UK;* [2]*Clinical Epidemiology and Biostatistics, Faculty of Medicine and Health, Örebro University, 701 82 Örebro, Sweden;* [3]*Research Department of Epidemiology and Public Health, UCL, London WC1E 7HB, UK;, UK;* [4]*BI: Norwegian Business School, Nydalsveien 37, 0484 Oslo, Norway.*

Correspondence should be addressed to Adrian Furnham, Department of Psychology, University College London, London WC1E 6BT, UK (Email: a.furnham@ucl.ac.uk)

ABSTRACT

Objective: To investigate social and psychological factors in childhood and adulthood associated with self-reported hypertension in adulthood.

Method: Using data from the National Child Development Study, a nationally representative sample of 17,415 babies born in Great Britain in 1958 and followed up at 11, 33, and 50 years of age. Self-reported diagnosed hypertension by 50 years was the outcome measure.

Results: In total, 5,753 participants with complete data on parental social class at birth, childhood cognitive ability tests scores at 11 years, educational qualifications at 33 years, personality traits, occupational levels, and self-reported hypertension (all measured at age 50 years) were included in the study. Using logistic regression analyses, results showed that sex (OR=0.60: 0.49-0.73, $p<.001$), educational qualifications (OR=0.59: 0.37-0.92, $p<.05$), and traits emotional stability (OR=0.84: 0.77-0.91, $p<.001$) and conscientiousness (OR=0.89: 0.82-0.98, $p<.05$) were all significantly associated with the occurrence of self-reported hypertension in adulthood.

Conclusion: Both psychological factors and socio-demographic factors were significantly associated with self-reported hypertension in adulthood.

Word count:

Keywords: Self-reported Hypertension; Educational Qualifications; Traits Emotional Stability and Conscientiousness; Cross-sectional and Longitudinal

Introduction

Worldwide, raised blood pressure is estimated to cause about 12.8% of the total of all deaths. Raised blood pressure is a major risk factor for coronary heart disease and ischemic as well as hemorrhagic stroke. Overall, approximately 20% of the world's adults are estimated to have hypertension (WHO, 2002).

This study investigates social and psychological correlates of self-reported hypertension. It in particular, concentrates on the role of personality traits in the incidence and reporting of adults aged 50 years. There is a long-standing literature on personality correlates of health and illness, as well as longevity (Chapman, Roberts, & Duberstein, 2011; Friedman & Kern, 2014; Matthews, Deary & Whiteman, 2009).

A number of previous studies have looked at personality and other psychological variables specifically associated with hypertension. Individual temperament has been found to be associated with hypertension, with the Dominant Cyclothymic Temperament (as a part of the Temperament Evaluation for Memphis, Pisa, Paris, and San Diego Autoquestionnaire) significantly increasing the odds of hypertension independent of biological factors, including age, BMI, and diabetes mellitus (Eory et al., 2014). Research on hostility shows that high levels of hostility lead to higher blood pressure specifically within young adults (Yan et al., 2003) and across a range of ages (Siegler et al., 1992). Cross-culturally, an investigation with Finnish males found that high levels of Hopelessness resulted in a three times higher incidence of hypertension (Everson et al., 2000), and high levels Defensiveness has been found to correlate with normotensive individuals developing hypertension over a three year period (Rutledge & Linden, 2000). The evidence suggests tendencies to hostile impulses, antagonism, and denial seem to relate to higher blood pressure, though results from different studies are inconsistent (Leclerc, Rahn, & Linden, 2006).

Studies using the 16PF test (Cattell et al., 1970) have found a negative association between Emotional Stability and intelligence and hypertension and positive relationships between conventionalism, insecurity, conservatism, and tension in individuals with high blood pressure (Spiro et al., 1995; Kidson, 1971). Using Eysenck's Personality Inventory (Eysenck & Eysenck, 1975) investigations have revealed that males who are Neurotic Introverts and Psychotic Extraverts, whilst females who are Neurotic Introverts and low on Psychoticism, have increased levels of hypertension (Mellors, Boyle, & Roberts, 1994). Extraversion has also been noted to be associated specifically with lower systolic blood pressure (Burke et al., 1992), while higher Neuroticism in general is correlated with hypertension. Brody, Veit and Rau (1996) found that Neuroticism was negatively associated (r=-.38) with mean blood pressure increase over a 4-year period in 75 German normotensives.

Anxiety (measured by the STAI), especially trait anxiety, has been found to be linked to hypertension incidence (Sanz et al., 2007). A meta-analysis revealed that Negative Affectivity (Neuroticism) and defensiveness traits were positively correlated with higher blood pressure for older samples, but negatively correlated for younger samples (Jorgensen et al., 1996). Furthermore, individuals who are unaware of their high blood pressure/primary hypertension showed a negative association with Negative Affectivity, whilst those who were aware showed a positive relationship. The inconsistent signs of correlations indicate that personality variables alone have not provided strong enough correlations so far to explain the multifaceted composition of primary hypertension.

Social class and education have been found to be associated with various health outcomes (Wilkinson, & Marmot, 2003), and with hypertension (Williams, 2010), and intelligence has been found to be associated with mortality (Batty et al., 2009).

The current study

This study set out to investigate parental social class, sex, childhood intelligence, education and occupation, and the Big Five model of personality to ascertain the associations between these factors and the outcome variable, the self-reported hypertension at the age of 50 years. The study has three strengths: first, it used a large, nationally representative birth cohort; second, it examined a set of inter-correlated social and psychological variables determining whether each of these variables independently associated with the outcome variable; third, it used the Big Five Personality Factors, which has sound psychometric properties. From the previous literature we predicted that higher parental social class would be significantly associated with less report of hypertension in adulthood (H1); higher childhood intelligence would be significantly associated with less report of hypertension in adulthood (H2); higher educational qualifications would be significantly associated with less report of hypertension (H3); participants with more professional occupation would report less hypotension (H4); Traits neuroticism and conscientiousness would be significantly and inversely associated with self-reported hypertension (H5, H6).

Method

Sample

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). The following analysis is based on data collected when the study participants were at birth, at ages 11, 33 and 50 years. At age 11 years, children completed tests of cognitive ability (response = 87%). At age 33 cohort members provided information on educational qualifications obtained (response = 72%). At age 50 years, cohort members provided information on current occupational levels (response = 67%), participants also

completed a questionnaire on personality traits (response = 69%), and provided information

on whether they are currently suffering from high blood pressure/hypertension (response =

79%). The analytic sample comprises 5,753 cohort members (50 per cent 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). Bias due to attrition

of the sample during childhood has been shown to be minimal (Davie, Butler, & Goldstein,

1972; Fogelman, 1976).

Measures

Childhood measures: Parental social class at birth was measured by the Registrar General's

measure of social class (RGSC). RGSC is defined according to occupational status and the

associated education, prestige or lifestyle (Marsh, 1986) and is assessed by the current or last

held job. Where the father was absent, the social class (RGSC) of the mother was used.

RGSC was coded on a six-point scale: I professional; II managerial\tech; IIIN skilled non-

manual; IIIM skilled manual; IV semi-skilled; and V unskilled occupations (Leete, 1977). At

birth mothers were interviewed and provided information on gestational age and birth weight.

Childhood cognitive ability tests (Douglas, 1964) were accessed when cohort members were

at age 11 years consisting of 40 verbal and 40 non-verbal items and were administered at

school. Adulthood measures: 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) which ranges from 'none' to 'university

degree/higher'/equivalent NVQ 5 or 6. Data on current or last occupation held by cohort

members at age 50 years were coded according to the Registrar General's Classification of

Occupations (RGSC), using a 6-point classification mentioned above. Personality traits were assessed 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 'Big-Five' personality traits: Extraversion, Emotionality /Neuroticism, Conscientiousness, Agreeableness, and Intellect/Openness. At age 50 participants provided information on the prevalence of hypertension to the question "Are you currently suffering from high blood pressure/hypertension?" with Yes/No response.

Statistical Analyses

To investigate the prevalence of hypertension in adulthood, first, we examined the characteristics of the study population using ANOVA. Second, we conducted the correlational analysis on the measures used in the study. Third, we carried out a series of logistic regression analyses using STATA version 12. Model l examines the childhood factors in influencing the occurrence of hypertension in adulthood; Model 2 examine the associations between adult social factors and the outcome variable, together with the childhood factors; Model 3 examines the associations between personality factors and hypertension in adulthood, together with factors examined in Models 1 and 2.

Results

Descriptive Analysis

Table 1 shows the characteristics of the study population according to the prevalence of hypertension at 50 years. There were significant sex differences in the prevalence of hypertension. It appears that the prevalence of hypertension was greater for men than for women (16.4% for men and 11.6% for women). ANOVA showed that the differences were statistically significant between men and women ($F(1,5751) = 27.61$, $p< .001$).

7

Insert Table 1 about here

It can be seen from Table 1 that there was a tendency of the greater rates of hypertension in adulthood and lower parental social class and lower cohort members' educational qualifications, but the pattern was not clear for the current occupational levels.

Correlation matrix of the variables in the study is shown in Appendix 1. Sex, parental social class, childhood intelligence, education and occupation, were all significantly associated with self-reported hypertension in adulthood. Among the Big Five personality factors, low neuroticism and high conscientiousness and high agreeableness were significantly associated with the outcome variable.

Regression analysis

Table 3 shows three models using the logistic regression. Model 1 shows that sex was a significant predictor of the prevalence of self-reported hypertension in adulthood. Model 2 shows that among adult social factors the highest educational qualification was a significant predictor of the outcome variable. Model 3 shows that when personality factors were entered into the equation, sex, the highest educational qualification, traits emotional stability and conscientiousness were statistically significantly ($p<.05$ to $p<.001$) associated with self-reported hypertension.

Insert Table 2 about here

Discussion

This study set out to explore the associations between psychological factors (intelligence and personality) and the prevalence of adult hypertension, taking account socio-demographic variables such as sex, education and occupation.

The logistic regressions showed four correlates of hypertension: Sex, the highest educational qualification, traits neuroticism and conscientiousness supporting the hypotheses. The theory of learned hypertension suggests that it is the pain sensitivity and stress-reactant characteristics of neurotics which through chronic Baroreceptors activity leads to increased hypertension. However, cardiovascular and other diseases may influence both distress and blood pressure, and the comorbidity of these conditions should be explored in future studies.

Consciousness was also significantly associated with hypertension. In their review of personality and health Friedman and Kern (2014) suggest various mechanisms to explain the well-established finding concerning the relationship between various health/illness outcomes and conscientiousness. It might be the self-control and prudence, the ingredients on trait conscientiousness, which are associated with health outcomes.

The link between educational achievement and the prevalence of hypertension found in the current study is in line with the previous findings in the area (Williams, 2010). It is not clear why men had greater rate of hypertension than women, though this finding appears to correspond to the findings in other countries (WHO, 1999). Future studies are required to explore further this association.

Limitations

First, the measure of hypertension is self-report rather than medical data by professionals, though self-reported health has been linked to mortality (Heistaro et al., 2001; Kaplan & Camacho, 1983). Future studies with biomedical data are required to confirm or refute the findings. Second, personality traits and hypertension were measured at the same time, at 50

9

years. Therefore the findings in part, are cross-sectional and longitudinal data of personality traits are required to verify the results.

Acknowledgements

References

Batty, G. D., Wennerstad, K. M., Smith, G. D., Gunnell, D., Deary, I. J., Tynelius, P., & Rasmussen, F. (2009). IQ in early adulthood and mortality by middle age: Cohort study of 1 million Swedish men. *Epidemiology (Cambridge, Mass.), 20,* 100-109.

Brody, S., Veit, R., & Rau, H. (1996). Neuroticism but not cardiovascular stress reactivity is associated with less longitudinal blood pressure increase. *Personality and Individual Differences, 20,* 375-380

Burke, V., Beilin, L.J., German, R., Grosskopf, S., Ritchie, J., Puddey, I.B., & Rogers, P. (1992). Association of lifestyle and personality: Characteristics with blood pressure and Hypertension: a cross-sectional study in the elderly. *Journal of Clinical Epidemiology, 45,* 1061 – 1070

Chapman, B. P, Roberts, B., & Duberstein, P. (2011). Personality and Longevity: Knowns, Unknowns, and Implications for Public Health and Personalized Medicine. *Journal of Aging Research*, 759170.

Chida, Y. & Steptoe, A. (2010). Greater Cardiovascular Responses to Laboratory Mental Stress Are Associated With Poor Subsequent Cardiovascular Risk Status: A Meta-Analysis of Prospective Evidence. *Hypertension, 55,* 1026 – 1032

Davie, R., Butler, N., & Goldstein, H. (1972). *From Birth to Seven,* London: Longman.

Denollet, J. (2005). DS14: Standard Assessment of Negative Affectivity, Social Inhibition, and Type D Personality. *Psychosomatic Medicine, 67,* 89 – 97

Douglas, J. W. B. (1964). *The home and the school*. London: Panther Books.

Eory, A., Gonda, X., Lang, Z., Torzsa, P., Kalman, J., Kalabay, L., & Rihmer, Z. (2014). Personality and cardiovascular risk: Associations between hypertension and affective temperaments – a cross sectional observation study in primary care settings. *European Journal of General Practice,* doi: 10.3109/13814788.2013.868431

Everson, S.A., Kaplan, G.A., Goldberg, D.E., & Salonen, J.T. (2000). Hypertension

    Incidence Is Predicted by High Levels of Hopelessness in Finnish Men. *Hypertension,*

    35, 561 – 567

Feinstein, L., & Bynner, J. (2004). The importance of cognitive development in middle

    childhood for adulthood socioeconomic status, mental health, and problem behaviour.

    Child Development, 75, 1329-1339.

Ferrans, C. E., & Powers, M. J. (1992). Psychometric assessment of the Quality of Life

    Index. *Research in Nursing and Health, 15,* 29-38.

Ferri, E., Bynner, J. & Wadsworth, M. (2003). *Changing Britain, changing lives: Three*

    generations at the turn of the century, London: Institute of Education.

Fogelman, K. (1976). *Britain's 16-year-olds,* London: National Children's Bureau.

Friedman, H. & Kern, M. (2104) Personality, well-being and health. *Annual Review of*

    Psychology, 65, 719-742.

Gerin, W., Pickering, T.G., Glynn, L., Christenfeld, N., Schwartz, A., Carroll, D., &

    Davidson, K.W. (2000). An historical context for behavioural models of hypertension.

    Journal of Psychosomatic Research, 48, 369 – 377.

Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring

    the lowerlevel facets of several five-factor models. In I. Mervielde, I. Deary, F. De

    Fruyt, & F. Ostendorf (Eds.), Personality Psychology in Europe, Vol. 7 (pp. 7-28).

    Tilburg, The Netherlands: Tilburg University Press.

Grant, G., Nolan, M., & Ellis, N. (1990). A reappraisal of the Malaise Inventory. *Social*

    Psychiatry and Psychiatric Epidemiology, 25, 170-176.

Habra, M.E., Linden, W., Anderson, J.C., & Weinberg, J. (2003). Type D personality is

    related to cardiovascular and neuroendocrine reactivity to acute stress. *Journal of*

    Psychosomatic Research, 55, 235 – 245

Hausteiner, C., Klupsch, D., Emeny, R., Baumert, J., Ladwig, K-H., KORA Investigators. (2010). Clustering of Negative Affectivity and Social Inhibition in the Community: Prevalence of Type D Personality as a Cardiovascular Risk Marker. *Psychosomatic Medicine, 72,* 163 – 171

Heistaro, S., Jousilahti, P., Lahelma , E., Puska, P. (2001). Self-rated health and mortality: A long term prospective study in eastern Finland. *Journal of Epidemiology and Community Health, 55*, 227-32.

Irvine, J., Garner, D.M., Craig, H.M., & Logan, A.G. (1991). Prevalence of Type A behavior in untreated hypertensive individuals. *Hypertension, 18,* 72 – 78

Jorgensen, R.S., Johnson, B.T, Kolodzeij, M.E., & Schreer, G.E. (1996). Elevated blood pressure and personality: a meta-analytic review. *Psychological Bulletin, 120,* 293 – 320

Kaplan, G. A. & Camacho, T. (1983). Perceived health and mortality: a nine-year follow-up of the human population laboratory cohort. *American Journal of Epidemiology, 117*, 292–304.

Kidson, M.A. (1971). Personality factors in hypertension. *Australian and New Zealand Journal of Psychiatry, 5,* 139 – 145.

Leclerc, J., Rahn, M., & Linden, W. (2006). Does personality predict blood pressure over a 10-year period? *Personality and Individual Differences, 40,* 1313-1321.

Lee, H.B., Offidani, E., Ziegelstein, R.C., Bienvenu, P.J., Samuels, J., Eaton, W.W., & Nestadt, G. (2013). Five-Factor Model Personality Traits as Predictors of Incident Coronary Heart Disease in the Community: A 10.5-Year Cohort Study Based on the Baltimore Epidemiologic Catchment Area Follow-Up Study. *Psychosomatics,* doi: 10.1016/j.psym.2013.11.004

Leete, R. and Fox, J. (1977), 'Registrar General's social classes: origins and users.
Population Trends, *8*, 1-7.

Marsh, C. (1986). Social class and occupation. In R. Burgess (Ed.), *Key variables in social investigation*. London: Routledge.

Matthews, K.A., Katholi, C.R., McCreath, H., Whooley, M.A., Williams, D.R., Zhu, S., & Markovitz, J.H. (2004). Blood Pressure Reactivity to Psychological Stress Predicts Hypertension in the CARDIA study. *Circulation, 110,* 74 – 78

Mellors, V., Boyle, G.J., & Roberts, L. (1994). Effects of personality, stress and lifestyle on hypertension: An Australian twin study. *Personality and Individual Difference, 16,* 967 – 974

Plewis, I., Calderwood, L., Hawkes, D., & Nathan, G. (2004). *National Child Development Study and 1970 British Cohort Study, Technical Report: Changes in the NCDS and BCS70 populations and samples over time*, London: Institute of Education, Centre for Longitudinal Studies

Rutledge, T. & Linden, W. (2000). Defensiveness status predicts 3-year incidence of hypertension. *Journal of Hypertension, 18,* 153 – 159

Sanz, J., Garcia-Vera, M.P., Magan, I., Espinosa, R., & Fortún, M. (2007). Differences in Personality between Sustained Hypertension, Isolated Clinic Hypertension and Normotension. *European Journal of Personality, 21,* 209 – 224

Siegler, I.C., Peterson, B.L., Barefoot, J.C., & Williams, R.B. (1992). Hostility during late adolescence predicts coronary risk factors at mid-life. *American Journal of Epidemiology, 136,* 146 - 154

Spiro, A., Aldwin, C.M., Ward, K.D., & Mroczek, D.K. (1995). Personality and the Incidence of Hypertension Among Older Men: Longitudinal Findings From the Normative Aging Study. *Health Psychology, 14,* 563 – 569

Williams, P.G., Rau, H.K., Cribbet, M.R., & Gunn, H.E. (2009). Openness to experience and stress regulation. *Journal of Research in Personality, 43,* 777 – 784

Williams, R.B. (2010). How Does Lower Education Get Inside the Body to Raise Blood Pressure? What Can We Do to Prevent This? *Hypertension, 55,* 617 – 618

WHO (1999).World Health Organization-International Society of Hypertension Guidelines for the Management of Hypertension. Guidelines Subcommittee. *Journal of Hypertension, 17*(2), 151-183.

WHO (2002). Reducing Risks, Promoting Healthy Life. Geneva, Switzerland: World Health Organization.

Yan, L.L., Liu, L., Matthews, K.A., Daviglus, M.L., Ferguson, T.F., & Kiefe, C.I. (2003). Psychosocial factors and risk of hypertension: the Coronary Artery Risk Development in Young Adults (CARDIA) study. *Journal of the American Medical Association, 290,* 2138 – 2148

Table 1. Social and demographic characteristics of the study population and prevalence of self-reported hypertension at age 50 years.

	n	%	Prevalence of self-reported hypertension %
Gender			
Male	2855	49.6	16.4
Female	2898	50.4	11.6
Parental social class at birth			
Unskilled (V)	415	7.6	14.7
Partly skilled (IV)	665	14.3	17.3
Skilled manual (III)	2800	50.0	14.4
Skilled non-manual (III)	641	10.8	13.6
Managerial\tech (II)	916	13.2	11.6
Professional (I)	316	4.2	10.8
Educational qualifications at age 33			
No qualifications	400	8.6	17.3
CSE 2-5/equivalent NVQ1	633	11.4	14.5
O Level/equivalent NVQ2	1988	37.5	15.2
A level/equivalent NVQ 3	901	14.9	13.3
Higher qualification/equivalent NVQ4	953	15.5	13.1
University Degree/equivalent NVQ 5, 6	878	12.2	11.2
Own current social class at age 50			
Unskilled (V)	116	2.2	15.5
Partly skilled (IV)	603	10.3	13.8
Skilled manual (III)	1006	19.2	15.4
Skilled non-manual (III)	1208	19.0	12.7
Managerial\tech (II)	2450	42.1	13.8
Professional (I)	370	7.2	15.7

Table 2. Odds ratios (95% CI) for self-reported hypertension at age 50 years, according to

socio-demographic and psychological factors in childhood and adulthood used in the study.

Measures	Model 1 Odds ratio (95% CI)	Model 2 Odds ratio (95% CI)	Model 3 Odds ratio (95% CI)	*p*-value[#]
Sex	0.66 (0.56, 0.77)***	0.62 (0.52, 0.74)***	0.60 (0.49, 0.73)***	0.000
Childhood factors				
Parental social class at birth *(unskilled as reference group)*				
Partly skilled	1.30 (0.90, 1.88)	1.31 (0.91, 1.89)	1.35 (0.92, 1.98)	0.130
Skilled manual	1.02 (0.74, 1.41)	1.04 (0.75, 1.43)	1.04 (0.74, 1.45)	0.840
Skilled non-manual	0.92 (0.62, 1.35)	0.93 (0.63, 1.37)	0.90 (0.60, 1.36)	0.628
Managerial\tech	0.83 (0.57, 1.20)	0.84 (0.58, 1.23)	0.89 (0.60, 1.31)	0.547
Professional	0.80 (0.49, 1.29)	0.82 (0.50, 1.34)	0.82 (0.50, 1.37)	0.465
Childhood intelligence at age 11	0.93 (0.86, 1.01)	0.94 (0.86, 1.03)	0.95 (0.86, 1.05)	0.290
Adult social factors				
Educational qualifications *(no qualification as reference group)*				
CSE 2-5/ equivalent NVQ1		0.75 (0.51, 1.10)	0.76 (0.52, 1.15)	0.192
O Level/ equivalent NVQ2		0.84 (0.60, 1.17)	0.89 (0.63, 1.27)	0.537
A level/ equivalent NVQ 3		0.71 (0.49, 1.03)†	0.75 (0.50, 1.11)	0.151
Higher qualification/ equivalent NVQ4		0.73 (0.50, 1.07)†	0.79 (0.53, 1.19)	0.258
University Degree/ equivalent NVQ 5, 6		0.57 (0.37, 0.87)**	0.59 (0.37, 0.92) *	0.020
Own social class *(unskilled as reference group)*				
Partly skilled		1.00 (0.53, 1.87)	0.95 (0.49, 1.84)	0.883
Skilled manual		0.90 (0.49, 1.66)	0.95 (0.50, 1.80)	0.884
Skilled non-manual		1.15 (0.63, 2.12)	1.16 (0.61, 2.19)	0.646
Managerial\tech		1.30 (0.71, 2.37)	1.35 (0.72, 2.54)	0.345
Professional		1.50 (0.77, 2.94)	1.55 (0.77, 3.12)	0.220
Adult personality factors				
Extraversion			0.98 (0.89, 1.08)	0.637
Emotional stability			0.85 (0.77, 0.91)***	0.000
Agreeableness			1.05 (0.95, 1.17)	0.321
Conscientiousness			0.90 (0.82, 0.98)*	0.014
Openness			1.01 (0.91, 1.11)	0.901

Note: †*p*<.10; *p<.05; **p<.01;***p<.001. Adjusted for gestational age and birth weight in all three models.
[#]*P*-values of the final model.

Appendix 1. Pearson product-moment correlations of variables in the study.

	Variables	Mean (SD)	1	2	3	4	5	6	7	8	9	10
1.	Self-reported hypertension	.14 (.35)	_									
2.	Sex	.50 (.50)	**-.069****	_								
3.	Parental social class	3.33 (1.24)	**-.043****	-.020	_							
4.	Childhood intelligence	104.2 (12.75)	**-.051****	.078**	.261**	_						
5.	Educational qualifications	2.70 (1.45)	**-.044****	-.081**	.325**	.482**	_					
6.	Own occupational levels	4.11 (1.20)	**-.003**	-.015	.212**	.326**	.456**	_				
7.	Extraversion	29.44 (6.60)	**-.026**	.078**	.033*	.021	.076**	.122**	_			
8.	Emotional stability	28.93 (7.07)	**-.064****	-.138**	.026	.090**	.087**	.075**	.216**			
9.	Agreeableness	36.85 (5.26)	**-.037***	.401**	.044**	.116**	.080**	.104**	.361**	.054**	_	
10.	Conscientiousness	34.00 (5.26)	**-.045****	.107**	.013	.040*	.064**	.088**	.144**	.183**	.277**	_
11.	Openness	32.55 (5.16)	**-.020**	-.013	.139**	.272**	.321**	.244**	.399**	.096**	.338**	.223**

Note: *p<.05; **p<.01. Variables were scored such that a higher score indicated being female, the presence of hypertension in adulthood, a more professional occupation for parents or cohort members, higher scores on childhood intelligence, highest educational qualifications, higher scores on traits extraversion, emotional stability, agreeableness, conscientiousness, and openness. Alphas of the Big-Five personality factors ranged from .73 to .88.