

**Early-Childhood Conduct Problems Predict Economic and Political Discontent in Adulthood: Evidence from Two Large, Longitudinal UK Cohorts**

Gary J. Lewis

Department of Psychology, Royal Holloway, University of London, Egham, Surrey, TW20 0EX, United Kingdom.

Email: [gary.lewis@rhul.ac.uk](mailto:gary.lewis@rhul.ac.uk)

## **Abstract**

Longstanding interest has been directed towards the etiology of socio-political attitudes. Personality traits have been posited as antecedents; however, most work addressing such links has been limited to cross-sectional study designs. The current study uses data from two large (both  $N > 8000$ ), longitudinal cohorts of individuals from the United Kingdom who were parent-assessed on a measure of temperament (assessing anxiety, conduct problems, and hyperactivity) at age 5 or 7, and on a range of socio-political attitudes at age 30 or 33. In both cohorts, higher levels of childhood conduct problems predicted higher levels of economic and political discontent in adulthood. These associations were still evident when controlling for sex, childhood intelligence, and parental social class. In both cohorts this pathway was partially mediated by educational attainment and achieved social class. These findings are consistent with the perspective that early-life temperament gives rise to adult political sentiment.

**Keywords:** personality; conduct problems; politics; attitudes; longitudinal; economic and political discontent

Over the years, considerable interest has been directed towards the etiology of social and political attitudes (e.g. Eysenck, 1954; Jost, Glaser, Kruglanski, & Sulloway, 2003). One major and longstanding focus of research has centred on whether political orientation is associated with individual differences in personality traits (e.g. Adorno et al., 1950; Eysenck, 1954; Jost et al., 2003; Sibley et al., 2012). Meta-analytic findings have supported the notion that personality is related to political attitudes: in Big Five personality trait terms, conscientiousness and openness are positive and negative predictors, respectively, of political conservatism (Sibley, Osborne, & Duckitt, 2012). A range of narrower constructs, including need for closure and intolerance of ambiguity, are also positively associated with political conservatism (Jost et al., 2003; Van Hiel et al., 2010).

A major criticism of this body of work has been the near-exclusive focus on cross-sectional study designs, although some recent exceptions to this trend are notable. For example, Perry and Sibley (2012) analysed data from a New Zealand sample of young adults (N=190) who were assessed on Big Five personality traits, right-wing authoritarianism, and social dominance orientation twice over a 9 month period. The authors observed that across the time-points higher levels of agreeableness led to lower levels of social dominance orientation, and higher levels of openness led to lower levels of right-wing authoritarianism (see also Sibley & Duckitt, 2010; 2013).

Perhaps most interestingly, two studies have assessed the relationship between early-childhood temperament/personality and adult political attitudes (Block & Block, 2006; Fraley et al., 2012). In the first of these studies, Block and Block (2006) found that a range of (teacher-rated) early-childhood characteristics – including anxiousness, fearfulness, and passivity – predicted (self-rated) political conservatism at age 23. More recently, Fraley and colleagues (2012) conducted a similar study, examining the relationship between childhood temperament at age 4 and political conservatism at age 18. In this study political

conservatism was predicted by lower levels of attentional focusing and restlessness, and by higher levels of fearfulness.

While these studies have added a valuable longitudinal dimension regarding the linkages between temperament/personality and socio-political attitudes, important limitations are also apparent. Firstly, the Block and Block (2006) study relied on a small sample (N=49 female; N=46 male; the sexes were analysed independently), and the reported results were not statistically significant at the standard threshold (i.e.  $p < .05$ ). Secondly, while Fraley and colleagues (2012) used a substantially larger sample (N=708) in their study, political conservatism was assessed when the participants were in late adolescence (age 18). Late adolescence/early adulthood is a well-known period of significant attitudinal change and development (Alwin & Krosnick, 1991). As such, it is unclear whether early-life personality is predictive of mature adult socio-political attitudes.

Thirdly, in both of the child-to-adult studies the links between temperament/personality and political attitudes in adulthood are comparable in magnitude to those reported in adult cross-sectional studies (e.g. Sibley et al., 2012). This observation, coupled with work noting that temperament/personality shows only moderate stability over childhood and adolescence (Lewis & Plomin, 2015; Roberts & DelVecchio, 2000), raises a concern regarding the plausibility of such long-term effects.

More generally, these studies focused on a general political conservatism measure; however, despite arguments for the relevance of a generalised 'left-right' dimension (Jost, Federico, & Napier, 2009), it is well established that political attitudes reflect a number of distinct components that are not well-characterised by a single dimension (Cheng, Bynner, Wiggins, & Schoon, 2012; Feldman & Johnston, 2014).

Finally, the discussion regarding why early temperament predicts adult political sentiment is typically restricted to motivated social cognition accounts (e.g. Jost et al., 2003).

However, it is likely that such links reflect a variety of broader mediating pathways. For example, two plausible mechanisms that have yet to be explored are educational attainment and achieved social class. Indeed, it is well noted that early-life temperament impacts on educational attainment (Lewis, Asbury, & Plomin, 2017), and educational attainment and social class are well-noted predictors of political sentiment (Hello, Scheepers, & Slegers, 2006; Phelan, Link, Stueve, & Moore, 1995). Educational attainment and achieved social class are thus a viable piece of the broader picture.

### **The current study**

Given the theoretical importance of establishing the role of early-life temperament/personality for adult socio-political attitudes, and to overcome limitations of previous research in the field, the current study sought to examine this relationship in two large samples ( $N > 8000$ ) of UK individuals who were assessed on several temperament characteristics in early childhood (age 5 or 7) as well as socio-political attitudes in adulthood (age 30 or 33). These two datasets thus provide the best opportunity to date for testing how early-life personality relates to adult socio-political attitudes. In line with previous highlighting a role for sex, parental social class, and general intelligence – as correlates of both childhood temperament and socio-political attitudes (Bradley & Corwyn, 2002; Deary, Batty, & Gale, 2008; Schoon, Cheng, Gale, Batty, & Deary, 2010) – we included these variables as covariates in our analyses. In addition, the role of educational achievement and achieved social class as mediators of any observed relationship between early-childhood temperament and adult socio-political attitudes was formally assessed.

## **Method**

### **Participants**

The data used in this analysis are drawn from two longitudinal cohort studies in the UK: 1) the British Cohort Study 1970 (BCS1970; Elliott & Shepherd, 2006; <https://discover.ukdataservice.ac.uk/series/?sn=200001>), and 2) the National Child Development Study 1958 (NCDS1958; Power & Elliott, 2006; <https://discover.ukdataservice.ac.uk/series/?sn=2000032>).

The BCS1970 is a longitudinal study examining 17,196 people born in England, Scotland, and Wales during one week in 1970. The current study examined data taken from sweeps of participants at age 5, collected in 1975 by the Institute of Child Health at the University of Bristol, and participants at age 30, collected in 2000 by the National Centre for Social Research, managed by the Centre for Longitudinal Studies. The total sample consisted of 8029 individuals (52% male). Ethnicity: 93% reported European (UK or other) ethnicity; the rest of the sample was a mix of West-Indian, Indian/Pakistani, “others”, and those who did not state their ethnicity.

The NCDS1958 is a longitudinal study examining 17,500 people born in England, Scotland, and Wales during one week in 1958. This study examined data taken from sweeps of participants at age 7, collected in 1965 by the Institute of Child Health at the University of Bristol, and participants at age 33, collected in 2000 by the Social Statistics Research Unit at City, University of London. The total sample consisted of 8312 individuals (49% male). Ethnicity: 96% reported European (UK or other) ethnicity; the rest of the sample was a mix of African, Indian/Pakistani, and “others”.

As noted above, data from both cohorts was collected by independent investigators and the current study had no control over the sampling strategy or sample size (i.e. the present work is a secondary data analysis of archival data). Nonetheless, statistical power in both cohorts was excellent: for example, 95% power ( $\alpha = .05$ : two-tailed) to detect a zero-order association of  $r = .05$ .

## Measures

### *Temperament*

*BCS1970*: When participants were age 5 their parents provided assessment of their temperament using a 19-item version of the Rutter Behaviour Scale (Rutter et al., 1970). These items tap a range of behaviours broadly concerned with anxiety, conduct problems/aggression, and hyperactivity. Parallel analysis (Horn, 1965) indicated that three factors were present. Principal axis factoring (extracting three factors) with promax rotation was subsequently administered. The model solution showed three clearly interpretable factors. These factors were clearly discriminated by items reflecting anxiety, conduct problems, and hyperactivity, respectively, and so were labelled accordingly (see Supplementary Material for more details). In the subsequent analyses, these factors were operationalized using a structural equation modelling approach (see further details below): items that loaded  $\geq .40$  on a given factor were used as indicators (items that loaded  $\geq .40$  on more than one factor were excluded). Higher scores reflected higher levels of the construct label.

*NCDS1958*: When participants were age 7 their parents provided assessment of their temperament using a 14-item version of the Rutter Behavior Scale (Rutter et al., 1970). As above, parallel analysis (Horn, 1965) indicated that three factors were present across the items. Principal axis factoring (extracting three factors) with promax rotation was subsequently administered. The model solution was virtually identical to that of the BCS1970 and so the same factor labels were used (see Supplementary Material for more details). In the subsequent analyses, these factors were operationalized using a structural equation modelling approach (again, see further details below): items that loaded  $\geq .40$  on a given factor were used as indicators (items that loaded  $\geq .40$  on more than one factor were excluded). Higher scores reflected higher levels of the construct label.

### *Socio-Political Attitudes*

*BCS1970*: Five socio-political attitude scales were created in line with recent and comprehensive confirmatory factor analytic work performed with data from these cohorts by Cheng et al. (2012): economic conservatism (6 items; sample item: “Government should redistribute income” (reverse-scored); Cronbach’s  $\alpha = .68$ ); political cynicism (3 items; sample item: “People like me have no say in what Government does”; Cronbach’s  $\alpha = .65$ ); racism (5 items; sample item: “Would not want a person from other race to be boss”; Cronbach’s  $\alpha = .83$ ); authoritarianism (7 items; sample item: “Law breakers should be given stiffer sentences”; Cronbach’s  $\alpha = .64$ ); and gender inequality (6 item; sample item: “Men & women should have chance to do same kind of work” (reverse-scored); Cronbach’s  $\alpha = .66$ ). Higher scores reflected higher levels of the construct label.

In addition, much work has noted the presence of higher order socio-political factors (e.g. Feldman & Johnston, 2014), which could represent an important and complementary level of analysis. Parallel analysis (Horn, 1965) indicated that two factors were present across the five socio-political variables. Principal axis factoring (extracting two factors) with promax rotation was subsequently administered. The model solution showed two clearly interpretable factors. Factor 1 loaded on economic conservatism (-.60) and political cynicism (.59) and was labelled ‘economic/political discontent’. Factor 2 loaded on authoritarianism (.42), gender inequality (.43), and prejudice (.50) and was labelled ‘social conservatism’. The full output is detailed in the Supplementary Materials). These factors were modelled as latent variables and assessed as dependent variables in the main analyses.

*NCDS1958*: The same procedure was used to form socio-political attitude scales in the NCDS data. Cronbach’s alpha was as follows: economic conservatism (6 items: Cronbach’s  $\alpha = .79$ ); political cynicism (4 items: Cronbach’s  $\alpha = .68$ ); racism (5 items:



Cronbach's  $\alpha = .82$ ); authoritarianism (7 items: Cronbach's  $\alpha = .67$ ); and gender inequality (6 items: Cronbach's  $\alpha = .68$ ). Higher scores reflected higher levels of the construct label.

Examination for the presence of the two higher order latent factors observed in the BCS1970 produced near-identical results (see Supplementary Materials) and so these factors were again modelled as latent variables and assessed as dependent variables in the main analyses.

### ***Parental Social Class***

*BCS1970*: Parental social class was determined from the father's occupation (or mother's occupation if no father was present) using six categories derived from the United Kingdom Registrar General's Classification of Occupations: 1) unskilled, 2) semi-skilled, 3) skilled manual, 4) skilled non-manual, 5) managerial/technical, or 6) professional. The median score was 3.

*NCDS1958*: Parental social class was determined from the father's occupation (or mother's occupation if no father was present) using five categories derived from the United Kingdom Registrar General's Classification of Occupations: 1) unskilled, 2) semi-skilled, 3) skilled non-manual or manual, 4) managerial/technical, or 5) professional. The median score was 3.

### ***Intelligence***

*BCS1970*: Childhood general intelligence was assessed using a modified version of the British Ability Scales (Elliot, Murray, & Pearson, 1978), adapted to facilitate administration by teachers. Four sub-scales were used assessing verbal ability (word definitions, word similarities) and nonverbal ability (digit recall, matrix reasoning). A sum score of the (z-scored) sub-scales was used as the measure of general intelligence. Higher scores reflected higher levels of intelligence.

*NCDS1958*: Childhood general intelligence was measured using a general ability test that was group administered at school when the participant was 11 years of age. The test is comprised of 40 verbal and 40 non-verbal items. A sum score was used as the measure of general intelligence. Higher scores reflected higher levels of intelligence.

### ***Educational Attainment***

*BCS1970*: At age 30 participants were asked about their highest academic or vocational qualification. These qualifications were divided into 7 categories, reflecting increasing attainment: 1) no qualifications, 2) CSE grades 2-5/GCSE grade D-G (national examinations normally taken at the minimum school leaving age of 16), 3) O levels/GCSE grades A-C, 4) A levels (national examinations normally taken at 18 years old), 5) higher education diploma, 6) degree (and equivalent), and 7) higher degree. The median score was 2.

*NCDS1958*: At age 33 participants were asked about their highest academic or vocational qualification. These qualifications were divided into 6 categories, reflecting increasing attainment: 1) no qualifications, 2) CSE grades 2-5, 3) O levels, 4) A levels, 5) professional qualifications, and 6) degree level or higher. The median score was 2.

### ***Achieved Social Class***

*BCS1970*: At age 30 participants were asked about their current social class using six categories derived from the United Kingdom Registrar General's Classification of Occupations: 1) unskilled, 2) semi-skilled, 3) skilled manual, 4) skilled non-manual, 5) managerial/technical, or 6) professional. The median score was 4.

*NCDS1958*: At age 33 participants were asked about their current social class using six categories as detailed above for the *BCS1970*. The median score was 4.

## Results

A structural equation modelling approach was used to examine the relationship between childhood temperament and adult socio-political attitudes. In step one, the three latent factors of anxiety, conduct problems, and hyperactivity were modelled as predictors of the respective socio-political attitude. In a second step, this baseline model was extended to include three key covariates: sex, childhood intelligence, and parental social class. Finally, where childhood temperament was a significant predictor of the adult socio-political attitude in both cohorts (after adjustment for covariates), educational attainment and achieved social class were included as mediators (see Figure 1). Findings are detailed below (see Table 1 and Figure 1; also see Supplementary Table 1).

### *Models Results Excluding Covariates*

In the models that excluded covariates a number of associations between childhood temperament and socio-political attitudes were apparent. Most notably, conduct problems were positively associated with gender inequality, political cynicism, prejudice, economic/political discontent, and social conservatism, and negatively associated with economic conservatism, across both cohorts. Anxiety was negatively associated with economic/political discontent across both cohorts, negatively with prejudice in the BCS1970, and positively with economic conservatism in the NCDS1958. Hyperactivity was positively associated with authoritarianism and political cynicism in the BCS1970.

### *Models Results Including Covariates*

Next, covariates were added to the models. Conduct problems were still negatively associated with economic conservatism and positively associated with economic/political discontent in both cohorts, and positively with political cynicism in the NCDS1958. In addition, anxiety was negatively associated with political cynicism in the NCDS1958, and hyperactivity was positively associated with political cynicism in the BCS1970.

The observation that conduct problems predicted both economic conservatism and economic/political discontent raises the following question – are the effects of conduct problems on economic conservatism direct, or do they flow through economic/political discontent? To this end the economic/political discontent model was re-estimated, but this time including a direct path from conduct problems to economic conservatism. In both cohorts this path was close to zero in magnitude ( $\beta = -.01$  [CI95%:  $-.05, .03$ ];  $\beta = -.01$  [CI95%:  $-.05, .03$ ]; BCS1970 and NCDS1958, respectively). These observations indicate that the association between conduct problems and economic conservatism is indirect in nature – with the more direct link evident for economic/political discontent

### *Educational Attainment and Achieved Social Class as Mediators*

Finally, the mediating roles of educational attainment and achieved social class were assessed. These analyses focused solely on economic/political discontent in line with conduct problems being a significant predictor in both the BCS1970 and the NCDS1958.

In the BCS1970 significant mediation was observed for the following pathways: conduct → educational attainment → economic/political discontent (.011 [CI95%: .005, .017]); conduct → educational attainment → achieved social class → economic/political discontent (.007 [CI95%: .003, .011]). Nonetheless, a direct path from conduct problems to economic/political discontent was still evident.

In the NCDS1958 significant mediation was observed for the following pathways: conduct → educational attainment → economic/political discontent (.020 [CI95%: .010, .030]); conduct → educational attainment → achieved social class → economic/political discontent (.014 [CI95%: .008, .020]); and conduct → achieved social class → economic/political discontent (.019 [CI95%: .005, .033]). As in the BCS1970, though, a direct path from conduct problems to economic/political discontent was still evident. See Figure 1 for the full mediation models in both cohorts.

Table 1. Descriptive statistics and inter-correlations for all study measures (BCS1970)

	Mean (SD)	Auth	Econ	Gender	Cynic	Prejudice	Anxiety	Conduct	Hyp	Intel	Edu	pSC	aSC
Auth	3.66 (0.57)	-											
Econ	2.78 (0.60)	-.07 [-.09,-.05]	-										
Gender	2.74 (0.56)	.18 [.16,.20]	-.08 [-.10,-.06]	-									
Cynic	3.16 (0.74)	.13 [.11,.15]	-.35 [-.37,-.33]	.07 [.05,.09]	-								
Prejudice	1.91 (0.67)	.20 [.18,.22]	-.04 [-.06,-.02]	.21 [.19,.23]	.11 [.09,.13]	-							
Anxiety	1.39 (0.38)	.02 [.00,.04]	-.02 [-.04,-.00]	.02 [.00,.04]	.00 [-.02,.02]	.00 [-.02,.02]	-						
Conduct	1.37 (0.33)	.06 [.04,.08]	-.11 [-.13,-.09]	.04 [.02,.06]	.09 [.07,.11]	.06 [.04,.09]	.17 [.15,.18]	-					
Hyper	1.65 (0.54)	.06 [.04,.08]	-.07 [-.09,-.05]	.02 [.00,.04]	.08 [.06,.10]	.05 [.03,.07]	.19 [.17,.21]	.43 [.42,.45]	-				
Intel	0.01 (3.01)	-.28 [-.30,-.26]	.19 [.17,.21]	-.06 [-.08,-.04]	-.16 [-.18,-.13]	-.22 [-.24,-.19]	-.04 [-.06,-.02]	-.19 [-.21,-.17]	-.14 [-.16,-.12]	-			
Edu	-	-.27 [-.29,-.25]	.21 [.19,.23]	-.09 [-.11,-.07]	-.20 [-.22,-.18]	-.25 [-.27,-.23]	.00 [-.02,.02]	-.18 [-.20,-.16]	-.13 [-.15,-.11]	.42 [.40,.44]	-		
pSC	-	-.15 [-.17,-.13]	.20 [.18,.22]	-.01 [-.03,.01]	-.14 [-.16,-.12]	-.10 [-.12,-.08]	-.03 [-.05,-.01]	-.16 [-.17,-.14]	-.13 [-.14,-.11]	.33 [.31,.35]	.32 [.31,.34]	-	
aSC	-	-.17 [-.19,-.15]	.26 [.24,.29]	-.06 [-.09,-.04]	-.19 [-.21,-.17]	-.18 [-.20,-.15]	.00 [-.03,.02]	-.15 [-.17,-.13]	-.11 [-.13,-.08]	.36 [.34,.38]	.51 [.49,.52]	.30 [.28,.32]	-
Sex	-	.07 [.05,.09]	.08 [.06,.10]	-.13 [-.15,-.11]	-.11 [-.14,-.09]	-.12 [-.14,-.10]	.05 [.03,.07]	-.17 [-.19,-.16]	-.07 [-.09,-.05]	-.03 [-.05,-.01]	.03 [.01,.05]	.00 [-.02,.01]	.08 [.06,.11]

Note. Range of scores for socio-political was from 1 to 5; range of scores for temperament was 1 to 3; Auth = authoritarianism; Econ = economic conservatism; Gender = gender inequality; Cynic = political cynicism; Hyper = hyperactivity; Intel = childhood intelligence; edu = education; pSC = parental social class; aSC = achieved social class.

Table 2. Descriptive statistics and inter-correlations for all study measures (NCDS1958)

	Mean (SD)	Auth	Econ	Gender	Cynic	Prejudice	Anxiety	Conduct	Hyp	Intel	Edu	pSC	aSC
Auth	3.53 (0.59)	-											
Econ	2.79 (0.74)	.06 [.04,.08]	-										
Gender	2.12 (0.55)	.25 [.24,.27]	.03 [.01,.05]	-									
Cynic	2.95 (0.75)	.16 [.14,.18]	-.45 [-.47,-.44]	.14 [.13,.16]	-								
Prejudice	2.22 (0.69)	.30 [.28,.32]	.05 [.03,.07]	.40 [.38,.41]	.13 [.11,.15]	-							
Anxiety	1.47 (0.52)	.00 [-.02,.02]	.02 [.00,.04]	-.01 [-.03,.01]	-.03 [-.05,-.01]	.01 [-.01,.03]	-						
Conduct	1.50 (0.37)	.03 [.01,.05]	-.09 [-.11,-.07]	.05 [.03,.07]	.10 [.08,.12]	.04 [.02,.06]	.11 [.09,.13]	-					
Hyp	1.46 (0.54)	.04 [.02,.06]	-.05 [-.07,-.03]	.01 [-.01,.03]	.07 [.05,.09]	.01 [-.01,.03]	.19 [.17,.21]	.40 [.39,.42]	-				
Intel	44.40 (15.72)	-.22 [-.24,-.20]	.25 [.23,.27]	-.18 [-.20,-.16]	-.28 [-.30,-.26]	-.17 [-.19,-.15]	.03 [.01,.05]	-.15 [-.17,-.13]	-.15 [-.17,-.13]	-			
Edu	-	-.29 [-.30,-.27]	.23 [.21,.25]	-.22 [-.24,-.20]	-.32 [-.33,-.30]	-.19 [-.21,-.17]	.04 [.02,.06]	-.14 [-.16,-.12]	-.12 [-.14,-.10]	.54 [.53,.56]	-		
pSC	-	-.09 [-.11,-.06]	.15 [.13,.17]	-.07 [-.09,-.05]	-.13 [-.15,-.11]	-.06 [-.08,-.04]	.01 [-.01,.04]	-.04 [-.07,-.02]	-.03 [-.05,-.01]	.19 [.17,.21]	.24 [.22,.26]	-	
aSC	-	-.19 [-.21,-.17]	.28 [.26,.30]	-.17 [-.19,-.16]	-.27 [-.29,-.25]	-.13 [-.15,-.11]	.03 [.01,.05]	-.11 [-.13,-.09]	-.07 [-.09,-.05]	.39 [.38,.41]	.55 [.54,.56]	.20 [.17,.22]	-
Sex	-	.04 [.02,.06]	.07 [.05,.09]	-.20 [-.22,-.18]	-.04 [-.06,-.02]	-.09 [-.11,-.07]	.02 [.00,.04]	-.16 [-.18,-.14]	-.04 [-.06,-.02]	.07 [.05,.09]	-.09 [-.10,-.07]	-.02 [-.04,.00]	-.01 [-.03,.01]

Note. Range of scores for socio-political was from 1 to 5; range of scores for temperament was 1 to 3; range of scores for general cognitive ability was 0 – 79; Auth = authoritarianism; Econ = economic conservatism; Gender = gender inequality; Cynic = political cynicism; Hyper = hyperactivity; pSC = parental social class; aSC = achieved social class.

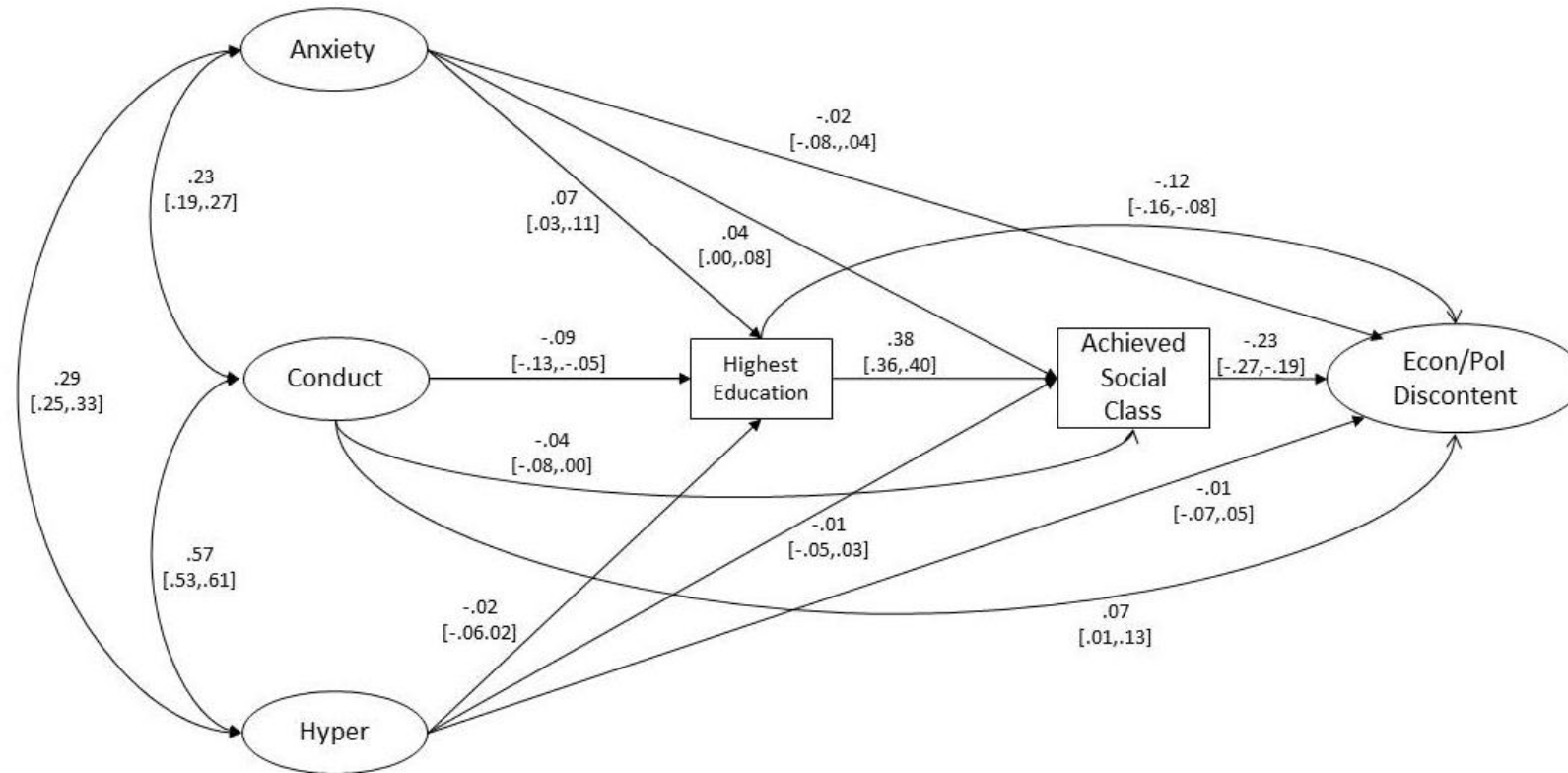
Table 3. Standardized parameter estimates for childhood temperament and adult socio-political attitudes

	<u>No covariates</u>			<u>With covariates</u>		
	Anxiety	Conduct	Hyperactivity	Anxiety	Conduct	Hyperactivity
<b><i>BCSI970</i></b>						
Authoritarianism	-.01 [-.03,.02]	.04 [.00,.08]	<b>.06</b> [.02,.10]	-.01 [-.04,.02]	.01 [-.04,.05]	.04 [.00,.08]
Economic conservatism	.01 [-.02,.04]	<b>-.14</b> [ <b>-.18,-.10</b> ]	.00 [-.04,.04]	.02 [-.01,.05]	<b>-.08</b> [ <b>-.12,-.04</b> ]	.01 [-.03,.05]
Gender inequality	.02 [-.01,.05]	<b>.05</b> [ <b>.01,.09</b> ]	-.01 [-.05,.03]	.04 [.00,.08]	.01 [-.03,.05]	-.01 [-.05,.03]
Political cynicism	<b>-.04</b> [ <b>-.07,-.01</b> ]	<b>.09</b> [ <b>.05,.13</b> ]	<b>.06</b> [ <b>.02,.10</b> ]	-.03 [-.06,.00]	.01 [-.03,.05]	<b>.05</b> [ <b>.01,.09</b> ]
Prejudice	<b>-.04</b> [ <b>-.07,-.01</b> ]	<b>.07</b> [ <b>.03,.11</b> ]	.03 [-.01,.07]	-.02 [-.05,.01]	.00 [-.04,.08]	.02 [-.02,.06]
Econ/political discontent	<b>-.05</b> [ <b>-.09,-.01</b> ]	<b>.19</b> [ <b>.13,.25</b> ]	.05 [-.01,.11]	-.04 [-.08,.00]	<b>.08</b> [ <b>.02,.14</b> ]	.03 [-.03,.09]
Social conservatism	-.03 [-.07,.01]	<b>.12</b> [ <b>.06,.18</b> ]	.06 [.00,.12]	.00 [-.06,.06]	.01 [-.05,.07]	.05 [-.01,.11]
<b><i>NCDS1958</i></b>						
Authoritarianism	-.03 [-.06,.00]	.00 [-.06,.06]	.06 [.00,.12]	-.01 [-.04,.02]	.03 [-.03,.09]	.00 [-.06,.06]
Economic conservatism	<b>.05</b> [ <b>.02,.08</b> ]	<b>-.15</b> [ <b>-.20,-.10</b> ]	.02 [-.04,.08]	.02 [-.02,.06]	<b>-.12</b> [ <b>-.18,-.06</b> ]	.06 [-.01,.13]
Gender inequality	-.03 [-.06,.00]	<b>.08</b> [ <b>.03,.13</b> ]	-.03 [-.09,.03]	-.01 [-.04,.02]	-.01 [-.07,.06]	-.02 [-.08,.04]
Political cynicism	<b>-.07</b> [ <b>-.10,-.04</b> ]	<b>.12</b> [ <b>.06,.18</b> ]	.03 [-.03,.09]	<b>-.04</b> [ <b>-.07,-.01</b> ]	<b>.12</b> [ <b>.06,.18</b> ]	-.05 [-.11,.01]
Prejudice	.00 [-.04,.04]	<b>.08</b> [ <b>.03,.13</b> ]	-.04 [-.10,.02]	.02 [-.02,.06]	.03 [-.03,.09]	-.04 [-.10,.02]
Econ/political discontent	<b>-.10</b> [ <b>-.14,-.06</b> ]	<b>.19</b> [ <b>.11,.27</b> ]	.01 [-.07,.09]	-.04 [-.08,.00]	<b>.17</b> [ <b>.09,.25</b> ]	-.07 [-.15,.01]
Social conservatism	-.03 [-.07,.01]	<b>.10</b> [ <b>.02,.18</b> ]	-.02 [-.10,.06]	.00 [-.04,.04]	.02 [-.08,.10]	-.03 [-.11,.05]

Note. CI95% in square brackets; bolded = parameter estimates where CI95% does not include zero; covariates were sex, parental social class, general intelligence; see Supplementary Materials for the unstandardized parameter estimates.

Figure 1. Parameter estimates (standardized) and model fit for mediation models: A) economic/political discontent as the dependent variable in the BCS1970; B) economic/political discontent as the outcome variable in the NCDS1958.

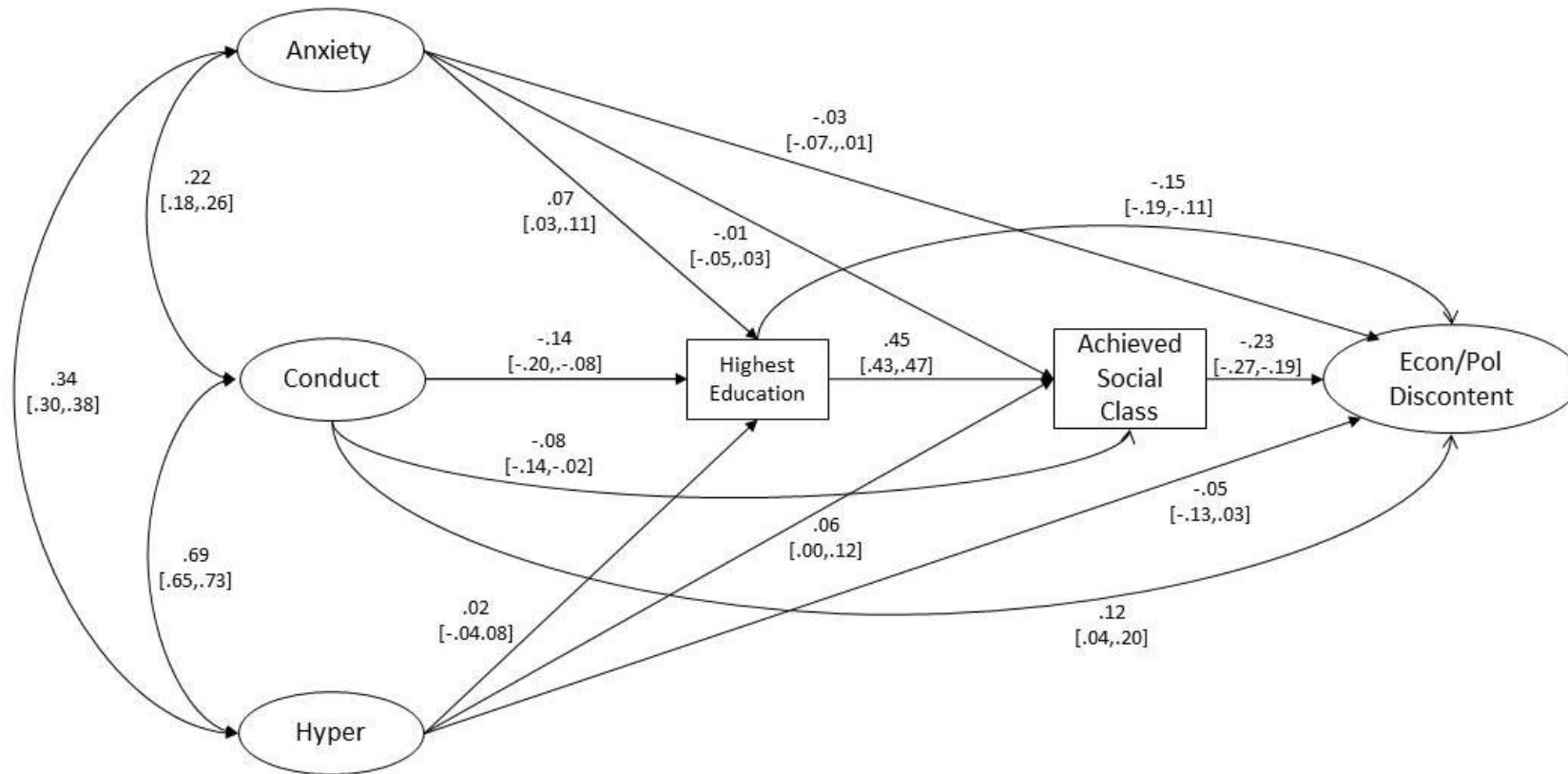
A)



Note. CFI = .92; RMSEA = .04;  $\chi^2$  (df) = 1401.12 (140),  $p < .001$ ; N=5413; standardized path coefficients are displayed; CI95% in square brackets; the indicators for anxiety, conduct problems, hyperactivity, and economic/political discontent, and the covariates (sex, childhood intelligence, parental social class), are omitted here in the interests of visual clarity: see Supplementary materials for full parameter estimates.



B)



Note. CFI = .96; RMSEA = .04;  $\chi^2$  (df) = 585.83 (60),  $p < .001$ ; N=5736; standardized path coefficients are displayed; CI95% in square brackets; the indicators for anxiety, conduct problems, hyperactivity, and economic/political discontent, and the covariates (sex, childhood intelligence, parental social class), are omitted here in the interests of visual clarity: see Supplementary materials for full parameter estimates.

## Discussion

The current study examined whether early-life temperament is predictive of adult socio-political attitudes using two large ( $N > 8000$ ), longitudinal UK cohorts: the British Cohort Study 1970 (BCS1970) and the National Child Development Study 1958 (NCDS1958). The most prominent results were as follows.

Conduct problems predicted lower levels of economic conservatism and higher levels of economic/political discontent in both cohorts. These associations were robust to the inclusion of sex, parental social class, and childhood general intelligence. Of note, as economic conservatism was an indicator of the latent factor of economic/political discontent the matter of which construct showed more proximal links to conduct problems was also assessed. These analyses revealed a direct link between conduct problems and economic/political discontent in both cohorts. Finally, this association was partially mediated by educational attainment and achieved social class in both cohorts.

How do the current findings cohere with previous work of this kind? The present results fail to confirm a role for anxiety as an early antecedent to a right-wing political phenotype, in contrast to the findings of both Block and Block (2006) and Fraley et al (2012). Similarly, no evidence was observed for a link between hyperactivity and any aspect of political conservatism, thus in contrast to recent work by Fraley et al (2012).

A number of explanations might explain these differences across studies: firstly, it is conceivable that the current measures differ in some way from those used in previous work. While this possibility cannot be definitively ruled out at this stage, the items used across studies appear (at least at face-level) to cohere fairly closely and so limit the scope of this concern. Secondly, socio-political attitudes here were measured when the participants were in their 30s (rather than late teens/early 20s, as in Block & Block, 2006, & Fraley et al., 2012), and it is well-noted that socio-political attitudes are in a state of flux in early adulthood

(Alwin & Krosnick, 1991). Thirdly, the two previous longitudinal studies were conducted in the US, whereas the current study used data from the UK. Sibley et al (2012) has noted that links between personality and political attitudes may be modulated by prevailing environmental context (e.g. levels of threat), although it is perhaps questionable that the UK and US differ so markedly as to generate distinct patterns of associations between temperament and socio-political attitudes. Finally, the previous studies may have capitalized on sample-specific associations that do not robustly generalize. This concern is most apparent with regard to the study of Block and Block (2006), which used a modest sample-size ( $N < 100$ ).

Early-childhood conduct problems predicted lower levels of adult economic/political discontent across two large cohorts and so appears to be a robust finding: what might account for this link? One explanation clearly lies with the observation of a significant mediation by educational attainment and achieved social class. This mediation may reflect the socio-economic benefits accrued from educational attainment (i.e. better-paid job, social prestige) in turn leading to a desire to protect both the status quo and one's acquired resources (Weeden & Kurzban, 2014). However, the magnitude of this indirect effect was modest, and so additional explanations are required. One possibility is that childhood conduct problems reflect enduring deficits in impulse control and long-term planning (Moffitt, 1993), which in turn lead one to favor government assistance rather than investing one's own time and efforts towards longer-term economic rewards. Another possibility is that conduct problems reflect the necessary antagonism or vigour to rebel against the status quo. Indeed, the prevailing economic model at the time when the adult socio-political attitudes were assessed – i.e. during the leaderships of Margaret Thatcher and Tony Blair - was broadly-speaking one of free-market capitalism.

Taken together, these findings confirm that early life temperament measures predict adult socio-political attitudes some 25 years later – at least with regard to economic and political discontent – and so are consistent with the perspective that temperament/personality acts as a shaping factor for attitudes. However, these findings should of course be considered carefully in light of the modest associations.

On the other hand, the remarkable stability of these associations across time and across cohort stand testament to their importance. And as other researchers have noted, small associations can give rise to important real-world consequences (Nofle & Robins, 2007; Ozer & Benet-Martinez, 2006). Perhaps more importantly, these findings indicate that while early temperament – at least in the context of conduct problems – is a modest predictor of adult political sentiment, it performs as well as a range of predictors that are routinely viewed to be of importance in the social sciences (Roberts et al., 2007). For example, the zero-order correlations (see Tables 1 and 2) demonstrate that the predictive power of conduct problems is comparable to attained level of education, parental social class, sex, and general intelligence. These findings, in turn, highlight that small effects in this domain are likely to be the norm, and that large, adequately powered samples, capable of reliably detecting such effects will be critical to developing a full understanding of the underlying bases of complex psychological constructs such as socio-political attitudes.

Specific limitations require mentioning. Firstly, the early-life temperament measures were not ideal inasmuch that they were brief and only assessed at one time point. Longer-form measures taken at multiple time-points would enhance the reliability of the assessment. Secondly, the measure of childhood temperament used here clearly does not exhaust the full breadth of important childhood temperament constructs, nor does it capture well-acknowledged personality predictors of politics, such as openness to experience (Sibley et al., 2012). The current analyses were necessarily constrained by the cohort sampling strategy.

Future work, then, should look to acquire broader measures in order to establish how well childhood temperament predicts adult social-political attitudes. Finally, educational attainment and achieved social class are almost certainly just two of the broader set of mechanisms that mediate the pathway from early-life temperament to adult socio-political attitudes. As such, future work might wish to probe the nature of this pathway more extensively.

In summary, the current study examined whether early-life temperament predicted adult socio-political attitudes in two large samples of UK individuals. In both cohorts early-childhood conduct problems was a negative predictor of adult economic and political discontent, and these links were partially mediated via educational attainment and achieved social class. These findings suggest that basic, early-emerging temperament gives rise to socio-political attitudes, at least with regard to economic and political discontent, consistent with the model that personality differences shape one's political orientation.

## References

- Alwin, D.F., & Krosnick, J.A. (1991). Aging, cohorts, and the stability of sociopolitical orientations over the life span. *American Journal of Sociology*, *97*, 169-195.
- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, *53*, 371-399.
- Cheng, H., Bynner, J., Wiggins, R., & Schoon, I. (2012). The measurement and evaluation of social attitudes in two British Cohort Studies. *Social Indicators Research*, *107*, 351-371.
- Deary, I. J., Batty, G. D., & Gale, C. R. (2008). Bright children become enlightened adults. *Psychological Science*, *19*, 1-6.
- Elliot, C., Murray, D., & Pearson, L. (1978). *British Ability Scales*. Windsor, UK: National Foundation for Educational Research.
- Elliott, J., & Shepherd, P. (2006). Cohort profile of the 1970 British Birth Cohort (BCS70). *International Journal of Epidemiology*, *35*, 836-843.
- Eysenck, H.J. (1954). *The psychology of politics*. London: Routledge & Kegan.
- Feldman, S., & Johnston, C. (2014). Understanding the determinants of political ideology: Implications of structural complexity. *Political Psychology*, *35*, 337-358.
- Hello, E., Scheepers, P., & Slegers, P. (2006). Why the more educated are less inclined to keep ethnic distance: An empirical test of four explanations. *Ethnic and Racial Studies*, *29*, 959-985.
- Horn, J.L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, *30*, 179-185.
- Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political ideology: Its structure, functions, and elective affinities. *Annual Review of Psychology*, *60*, 307-337.

- Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin*, *129*, 339-375.
- Lewis, G.J. & Plomin, R. (2015). Heritable influences on behavioral problems from early childhood to mid-adolescence: Evidence for genetic stability and innovation. *Psychological Medicine*, *45*, 2171-2179.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: a developmental taxonomy. *Psychological Review*, *100*, 674-701.
- Noftle, E. E., & Robins, R.W. (2007). Personality predictors of academic outcomes: Big Five correlates of GPA and SAT scores. *Journal of Personality and Social Psychology*, *93*, 116–130.
- Ozer, D. J., & Benet-Martinez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology*, *57*, 401–421.
- Phelan, J., Link, B. G., Stueve, A., & Moore, R. E. (1995). Education, social liberalism, and economic conservatism: Attitudes toward homeless people. *American Sociological Review*, *60*, 126-140.
- Power, C., & Elliott, J. (2006). Cohort profile: 1958 British birth cohort (national child development study). *International Journal of Epidemiology*, *35*, 34-41.
- Perry, R., & Sibley, C. G. (2012). Big-Five personality prospectively predicts social dominance orientation and right-wing authoritarianism. *Personality and Individual Differences*, *52*, 3–8.
- Roberts, B. W., Kuncel, N. R., Shiner, R., Caspi, A., & Goldberg, L. R. (2007). The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological Science*, *2*, 313-345.

- Roberts, B.W., & DelVecchio, W.F. (2000). The rank-order consistency of personality traits from childhood to old age: a quantitative review of longitudinal studies. *Psychological Bulletin*, 126, 3-25.
- Rutter, M., Tizard, J., & Whitmore, K. (1970). *Education, health and behaviour*. London: Longman.
- Schoon, I., Cheng, H., Gale, C. R., Batty, G. D., & Deary, I. J. (2010). Social status, cognitive ability, and educational attainment as predictors of liberal social attitudes and political trust. *Intelligence*, 38, 144-150.
- Sibley, C. G., & Duckitt, J. (2010). The personality bases of ideology: A one-year longitudinal study. *Journal of Social Psychology*, 150, 540-559.
- Sibley, C. G., & Duckitt, J. (2013). The dual process model of ideology and prejudice: A longitudinal test during a global recession. *Journal of Social Psychology*, 153, 448-466.
- Sibley, C. G., Osborne, D., & Duckitt, J. (2012). Personality and political orientation: Meta-analysis and test of a Threat-Constraint Model. *Journal of Research in Personality*, 46, 664-677.
- Weeden, J., & Kurzban, R. (2014). *The hidden agenda of the political mind: How self-interest shapes our opinions and why we won't admit it*. Princeton University Press.