



## Short Communication

## Cognitive ability and political beliefs in the United States



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## ABSTRACT

Recent evidence indicates that cognitive ability has a monotonically positive relation to socially liberal beliefs and some measures of fiscally conservative beliefs, and that it has a non-monotonic relation to other measures of fiscally conservative beliefs. This study examines the relationship between cognitive ability and political beliefs in a recent, nationally representative sample of American adults. It finds that cognitive ability is positively associated with both socially liberal beliefs and fiscally conservative beliefs. The relationships with socially liberal beliefs are monotonically positive. In contrast, some of the relationships with fiscally conservative beliefs are non-monotonic: Americans of highest ability are less fiscally conservative than those of high ability. The association between cognitive ability and a dimension of fiscal conservatism is reduced substantially when controlling for socio-economic position.

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## 1. Introduction

Numerous studies have found that individuals with higher cognitive ability tend to be more socially liberal on issues such as gay marriage, abortion, working women, free speech and marijuana legalisation (Deary, Batty, & Gale, 2008; Kimmelmeier, 2008; Stankov, 2009; Schoon, Cheng, Gale, Batty, & Deary, 2010; Kanazawa, 2010; Heaven, Ciarrochi, & Leeson, 2011; Hodson & Busseri, 2012; Carl, 2014). At the same time, some studies have found that individuals with higher cognitive ability tend to be more fiscally conservative<sup>1</sup> in areas such as redistribution of income and government intervention in the economy (Caplan & Miller, 2010; Carl, 2014; Mollerstrom & Seim, 2014; Oskarsson et al., 2014; Rindermann, Flores-Mendoza, & Woodley, 2012). On the other hand, Solon (2014) argues that there is actually U-shaped relationship between cognitive ability and leftism such that people with very high cognitive ability tend to be more left-wing than those of only high ability. In support of this argument, he points out that academics and other scholarly elites lean overwhelmingly toward the Democratic Party in the United States. Responding to Solon's (2014) article, Carl (2015) finds that cognitive ability has a pronounced U-shaped relation to some measures of leftism, a slightly U-shaped relation to others, and a monotonic negative relation to still others.

The finding that cognitive ability has a positive relation to both socially liberal beliefs and at least some measures of fiscally conservative beliefs is consistent with evidence that a single ideological axis (from left to right, or from liberal to conservative) is insufficient to characterise the distribution of political beliefs within countries such as the United States (Carl, 2015; Feldman & Johnston, 2014). What's more, cognitive ability is not the only psychological trait that has been identified with this pattern of associations: Malka, Soto, Inzlicht, and Lelkes (2014) find that need for security and certainty is positively associated with socially conservative attitudes, but negatively associated with right-wing economic attitudes. The present study examines the relationship between cognitive ability and political beliefs in a recent, nationally representative sample of American adults.

## 2. Method

## 2.1. Data

Data are from the 2012 wave of the American National Election Study (ANES): a biennial/triennial survey concerned with Americans' political attitudes and behaviours. In the 2012 wave, two separate nationally representative samples were collected, one via face-to-face interviewing, and one via the internet. The present study only utilises the face-to-face sample because one of the cognitive ability measures is not available for the internet sample. Respondents in the face-to-face sample were interviewed twice: before and then after the

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E-mail address: [noah.carl@nuffield.ox.ac.uk](mailto:noah.carl@nuffield.ox.ac.uk)<sup>1</sup> Confusingly, 'fiscal conservatism' is also known as 'economic liberalism' (see Klein, 2014).

presidential election. Precise details of the sampling design employed for the 2012 wave of the ANES are provided in the survey's codebook (ANES, 2014a).

## 2.2. Measurement of cognitive ability

Two measures of cognitive ability are available in the 2012 wave of the ANES. The first is a 10-item vocabulary test in which the respondent must identify which of five phrases supplies the correct definition of a given word. It was administered to respondents once, during the pre-election interviews. In general, vocabulary tests load more strongly onto the crystallised factor of general intelligence than onto the fluid factor (Cattell, 1963). They tend to have high heritabilities and high *g*-loadings, relative to other subtests (Jensen, 2001). For a longer discussion of the measure's validity, see Caplan and Miller (2010).

The second measure of cognitive ability is a rating by the interviewer of the respondent's apparent intelligence. In particular, the interviewer assesses whether the respondent's intelligence appears to be "very low", "fairly low", "average", "fairly high" or "very high". These categories were re-coded from '1' to '5', respectively. Because assessments were made during both the pre-election and post-election interviews, I utilise each respondent's average rating. Encouragingly, the Pearson correlation between the two ratings is strong, namely  $r = .69$  ( $p < 0.001$ ,  $n = 1906$ )<sup>2</sup>. Whilst the measure obviously relies on the interviewer's subjective judgement, studies have demonstrated that observer ratings of intelligence are positively correlated with actual test scores (Borkenau & Liebler, 1993; Hall, Andrzejewski, Murphy, Mast, & Feinstein, 2008). Furthermore, it was recently employed by Urbatsch (2012) in a successful replication of the association between cognitive ability and electoral turnout.

Because both measures of cognitive ability are somewhat crude, I combine the two using principal components analysis (PCA). Specifically, I extract the first principal component from a PCA on vocabulary test score, measured from 0 to 10, and average interviewer rating, measured from 1 to 5. This component had an eigenvalue of 1.41 and explained 71% of the variance. It is approximately normally distributed, with a very slight positive skew (mean = 0, median = -0.09). The Pearson correlation between the two original measures is moderate-to-large, namely  $r = .39$  ( $p < 0.001$ ,  $n = 1862$ ).

## 2.3. Measurement of political beliefs

Seven measures of socially liberal beliefs are utilised. These encompass attitudes toward gay marriage, abortion, immigration, marijuana legalisation, the death penalty, torture, and government wiretaps. Twenty-four measures of fiscally conservative beliefs are utilised. These encompass attitudes toward the size and scope of government, the free market, business regulation, income redistribution, government spending, the Affordable Care Act, the budget deficit, the top rate of income tax, and affirmative action. Details about each measure can be found in the survey's pre-election and post-election questionnaires (ANES, 2014b, 2014c).

## 3. Results

The first column in Table 1 displays correlations between cognitive ability and seven measures of socially liberal beliefs. In all seven cases, the correlation is positive and statistically significant.

**Table 1**

Relationships between cognitive ability and seven measures of socially liberal beliefs.

	Correlation with cognitive ability	Quadratic term: significant <i>t</i> -test, sign	Most socially liberal decile
Favour legal recognition of gay relationships (1–3)	.09*	Yes, positive	10 <sup>th</sup>
Favour legal abortion (1–9)	.14***	No	10 <sup>th</sup>
Favour increasing immigration (1–5)	.20***	Yes, positive	10 <sup>th</sup>
Favour legalising marijuana (1–3)	.08**	No	10 <sup>th</sup>
Oppose the death penalty (1–2)	.13***	Yes, positive	10 <sup>th</sup>
Oppose torture of terrorist suspects (1–3)	.09*	No	10 <sup>th</sup>
Government wiretaps have gone too far (1–3)	.16***	No	10 <sup>th</sup>

Notes: Estimates are from weighted OLS models. *n*'s range from 1646 to 1841. Significance levels, based on linearized standard errors: \*5%, \*\*1%, \*\*\*0.1%. Tests on quadratic terms were conducted at the 5% level.

The second column in Table 1 shows whether or not a quadratic term in cognitive ability enters significantly at the 5% level, along with its sign if it does so. In three cases, the quadratic term is positive and significant, which implies that the effect of cognitive ability becomes stronger at higher levels of cognitive ability. The third column in Table 1 indicates which decile of cognitive ability is the most socially liberal on average. In all seven cases, social liberalism peaks in the 10<sup>th</sup> decile.

The first column in Table 2 displays correlations between cognitive ability and twenty-four measures of fiscally conservative beliefs. In twenty-two cases, the correlation is positive, and in nineteen cases, positive and significant. In one case, namely attitude toward federal spending on science and technology, the correlation is significantly negative. The second column in Table 2 shows whether or not a quadratic term in cognitive ability enters significantly at the 5% level, along with its sign if it does so. In eight cases, the quadratic term is negative and significant, while in four cases it is positive and significant. The third column in Table 2 indicates which decile of cognitive ability is the most fiscally conservative on average. In sixteen cases, fiscal conservatism peaks before the 10<sup>th</sup> decile. The difference in average fiscal conservatism between the most fiscally conservative decile and the 10<sup>th</sup> decile is significant at the 5% level in two cases: attitude toward public expenditure on welfare, and attitude toward affirmative action at work.

A dimension of social liberalism was obtained by extracting the first principal component from a PCA on the seven measures of socially liberal beliefs. This component had an eigenvalue of 1.73 and explained 25% of the variance; all factors loadings had positive signs. Likewise, a dimension of fiscal conservatism was obtained by extracting the first principal component from a PCA on the twenty-four measures of fiscally conservative beliefs. This component had an eigenvalue of 6.10 and also explained 25% of the variance; all factor loadings except one (attitude toward public spending on defence) had positive signs.

There is a moderate negative association between social liberalism and fiscal conservatism:  $r = -.36$  ( $p < 0.001$ ,  $n = 990$ ). Consistent with the results from Tables 1 and 2, cognitive ability has a small-to-moderate positive correlation with both social liberalism ( $r = .22$ ,  $p < 0.001$ ,  $n = 1449$ ) and fiscal conservatism ( $r = .22$ ,

<sup>2</sup> All reported *n*'s are unweighted.

**Table 2**  
Relationships between cognitive ability and twenty-four measures of fiscally conservative beliefs.

	Correlation with cognitive ability	Quadratic term: significant <i>t</i> -test, sign	Most fiscally conservative decile
The less government the better (1–2)	.32***	Yes, negative	9 <sup>th</sup>
Free market can handle complex problems (1–2)	.14***	No	8 <sup>th</sup>
Government should provide fewer services (1–7)	.19***	No	9 <sup>th</sup>
Government should let each person get ahead on their own (1–7)	.23***	Yes, negative	9 <sup>th</sup>
Less government regulation of business (1–5)	.08*	Yes, negative	4 <sup>th</sup>
Government should not take action on income inequality (1–5)	.29***	No	8 <sup>th</sup>
Health insurance should be paid for privately (1–7)	.10*	Yes, negative	7 <sup>th</sup>
Less public expenditure on education (1–5)	.07	No	10 <sup>th</sup>
Less public expenditure on welfare (1–5)	.18***	Yes, negative	7 <sup>th</sup>
Less public expenditure on law enforcement (1–5)	.05	No	9 <sup>th</sup>
Less public expenditure on Social Security (1–5)	.27***	No	10 <sup>th</sup>
Less public expenditure on defence (1–5)	.21***	Yes, positive	10 <sup>th</sup>
Less public expenditure on business and industry (1–5)	.24***	No	10 <sup>th</sup>
Decrease federal spending on public schools (1–3)	.14***	Yes, positive	10 <sup>th</sup>
Decrease federal spending on welfare (1–3)	.14***	Yes, negative	7 <sup>th</sup>
Decrease federal spending on crime (1–3)	.22***	Yes, positive	10 <sup>th</sup>
Decrease federal spending on pensions (1–3)	.27***	Yes, positive	10 <sup>th</sup>
Decrease federal spending on the environment (1–3)	.14***	No	9 <sup>th</sup>
Decrease federal spending on science and technology (1–3)	–.11**	No	4 <sup>th</sup>
Oppose the Affordable Care Act (1–7)	.05	No	8 <sup>th</sup>
Favour reducing the budget deficit (1–7)	.26***	No	10 <sup>th</sup>
Oppose increasing the income tax on millionaires (1–7)	.00	No	1 <sup>st</sup>
Oppose affirmative action at work (1–7)	.10**	Yes, negative	8 <sup>th</sup>
Oppose affirmative action at universities (1–7)	.12***	Yes, negative	7 <sup>th</sup>

Notes: Estimates are from weighted OLS models. *n*'s range from 1559 to 1844. Significance levels, based on linearized standard errors: \*5%, \*\*1%, \*\*\*0.1%. Tests on quadratic terms were conducted at the 5% level.

**Table 3**  
Standardised effects of cognitive ability, socio-economic position, gender, age and race on social liberalism and fiscal conservatism.

	Social liberalism			Fiscal conservatism		
Cognitive ability	0.23***	0.18***	0.25***	0.21***	0.09	0.04
Socio-economic position		0.07	0.08		0.21***	0.15**
Female			–0.04			–0.08
Age 30–39			–0.04			–0.05
Age 40–59			–0.19***			–0.04
Age 60–90			–0.27***			–0.01
Black			0.10***			–0.32***
Hispanic			0.05			–0.17***
Other			0.05			–0.08**
<i>n</i>	1353	1353	1353	1017	1017	1017
<i>R</i> <sup>2</sup>	0.05	0.05	0.13	0.04	0.07	0.19

Notes: Socio-economic position was obtained by extracting the first principal component from a PCA on highest level of educational attainment, measured from 1 (“Less than First Grade”) to 16 (“Doctoral degree”), and annual family income, measured from 1 (“Under \$5000”) to 28 (“\$250,000 or more”). This component had an eigenvalue of 1.39 and explained 70% of the variance. The correlation between highest level of educational attainment and annual family income was  $r = .40$  ( $p < 0.001$ ,  $n = 1932$ ). Male is the reference category for gender. Age 17–29 is the reference category for age. White is the reference category for race. Significance levels, based on linearized standard errors: \*5%, \*\*1%, \*\*\*0.1%.

$p < 0.001$ ,  $n = 1095$ ).<sup>3</sup> Correlations of the two sub-dimensions of cognitive ability with social liberalism and fiscal conservatism are comparable in magnitude (see Appendix A.1). A quadratic term in cognitive ability is significant and positive in the model of social liberalism, but is not significant in the model of fiscal conservatism. Social liberalism peaks in the 10<sup>th</sup> decile of cognitive ability. In comparison, fiscal conservatism peaks in the 9<sup>th</sup> decile; the difference

between the 9<sup>th</sup> and 10<sup>th</sup> deciles is relatively small and non-significant ( $d = 0.14$ ,  $p > 0.1$ ).

Table 3 displays estimates from multiple linear regression models of social liberalism and fiscal conservatism. Adjusting for a dimension of socio-economic position reduces the standardised effect of cognitive ability on social liberalism by only 19%, but reduces the standardised effect of cognitive ability on fiscal conservatism by 55% and renders it non-significant. (A correlation matrix for these variables is provided in Appendix B.1). Adjusting for the exogenous variables of age, gender and race in addition to socio-economic position does not reduce the standardised effect of cognitive ability on social liberalism, but reduces the standardised effect of cognitive ability on fiscal conservatism by 79% and renders it non-significant.

#### 4. Discussion

Cognitive ability was positively associated with both socially liberal beliefs and fiscally conservative beliefs. The relationships with socially liberal beliefs were monotonically positive. In contrast, some of the relationships with fiscally conservative beliefs were non-monotonic: Americans of highest ability were less fiscally conservative than those of high ability (see Carl, 2015; Rindermann et al., 2012; Solon, 2014). Cognitive ability was correlated at  $r = .22$  with dimensions of social liberalism and fiscal conservatism. These correlations would generally be regarded as small-to-moderate (Cohen, 1988); they are comparable to other effect sizes in the literature (see Carl, 2014; Heaven et al., 2011; Oskarsson et al., 2014). The association between cognitive ability and fiscal conservatism was reduced substantially when controlling for socio-economic position, which suggests that it arises at least partly from economic self-interest.

There are of course several important limitations to this study. First, the measure of cognitive ability utilised can at best provide no more than a rough gauge of general intelligence: it was constructed from just two variables, neither of which evaluated

<sup>3</sup> It has a moderate-to-large correlation with the positive manifold of social liberalism and fiscal conservatism (the second principal component):  $r = .40$  ( $p < 0.001$ ,  $n = 965$ ).

respondents' abstract reasoning ability through analytical tests. Second, as noted above, none of the effect sizes observed is particularly large. Third, the results correspond to a particular country in a particular time period; they cannot be assumed to hold universally. As Woodley (2011) argues, the association between cognitive ability and political beliefs may vary depending on prevailing cultural values and social norms.

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**Appendix A**

See Table A.1.

**Table A.1**  
Correlations of vocabulary test score and average interviewer rating with social liberalism and fiscal conservatism.

	Social liberalism	Fiscal conservatism
Vocabulary test score	.24***	.18***
Average interviewer rating	.12**	.18**

Notes: Estimates are from weighted OLS models. A quadratic term in vocabulary test score was positive and significant in the model of social liberalism. In the other three models, the quadratic term in cognitive ability was not significant. n's range from 1107 to 1479. Significance levels, based on linearized standard errors: \*5%, \*\* 1%, \*\*\* 0.1%.

**Appendix B**

See Table B.1.

**Table B.1**  
Correlations of vocabulary test score and average interviewer rating with social liberalism and fiscal conservatism.

	Cognitive ability	Socio-economic position	Social liberalism	Fiscal conservatism
Cognitive ability	1			
Socio-economic position	.55***	1		
Social liberalism	.24***	.16***	1	
Fiscal conservatism	.21***	.26***	-.36***	1

Notes: Estimates are from weighted OLS models. n equals 925. Significance levels, based on linearized standard errors: \*5%, \*\* 1%, \*\*\* 0.1%.

**References**

ANES (2014a). *User's guide and codebook for the ANES 2012 Time Series Study*. Ann Arbor, MI and Palo Alto, CA: The University of Michigan and Stanford University.

ANES (2014b). *ANES 2012 pre-election questionnaire*. Ann Arbor, MI and Palo Alto, CA: The University of Michigan and Stanford University.

ANES (2014c). *ANES 2012 post-election questionnaire*. Ann Arbor, MI and Palo Alto, CA: The University of Michigan and Stanford University.

Borkenau, P., & Liebler, A. (1993). Convergence of stranger ratings of personality and intelligence with self-ratings, partner ratings, and measured intelligence. *Journal of Personality and Social Psychology*, 65, 546–553.

Caplan, B., & Miller, S. C. (2010). Intelligence makes people think like economists: Evidence from the General Social Survey. *Intelligence*, 38, 636–647.

Carl, N. (2014). Verbal intelligence is correlated with socially and economically liberal beliefs. *Intelligence*, 44, 142–148.

Carl, N. (2015). Does intelligence have a U-shaped relationship with leftism? *Intelligence*, 49, 159–170.

Cattell, R. B. (1963). Theory of fluid and verbal intelligence: A critical experiment. *Journal of Educational Psychology*, 54, 1–22.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Deary, I. J., Batty, G. D., & Gale, C. R. (2008). Bright children become enlightened adults. *Psychological Science*, 19, 1–6.

Feldman, S., & Johnston, C. (2014). Understanding the determinants of political ideology: Implications of structural complexity. *Political Psychology*, 35, 337–357.

Hall, J. A., Andrzejewski, S. A., Murphy, N. A., Mast, M. S., & Feinstein, B. A. (2008). Accuracy of judging others' traits and states: Comparing mean levels across tests. *Journal of Research in Personality*, 42, 1476–1489.

Heaven, P. C. L., Ciarrochi, J., & Leeson, P. (2011). Cognitive ability, right-wing authoritarianism, and social dominance orientation: A five-year longitudinal study amongst adolescents. *Intelligence*, 39, 15–21.

Hodson, G., & Busseri, M. A. (2012). Bright minds and dark attitudes: Lower cognitive ability predicts greater prejudice through right-wing ideology and low inter-group contact. *Psychological Science*, 23, 187–195.

Jensen, A. (2001). Vocabulary and general intelligence. *Behaviour and Brain Sciences*, 24, 1109–1110.

Kanazawa, S. (2010). Why liberals and atheists are more intelligent. *Social Psychology Quarterly*, 73, 33–57.

Kemmelmeier, M. (2008). Is there a relationship between political orientation and cognitive ability? A test of three hypotheses in two studies. *Personality and Individual Differences*, 45, 767–772.

Klein, D. (2014). The origin of 'Liberalism'. *The Atlantic*, February 13.

Malka, A., Soto, C. J., Inzlicht, M., & Leles, Y. (2014). Do needs for security and certainty predict cultural and economic conservatism? A cross-national analysis. *Journal of Personality and Social Psychology*, 106, 1031–1051.

Mollerstrom, J., & Seim, D. (2014). Cognitive ability and the demand for redistribution. *PLoS ONE*, 9, e109955.

Oskarsson, S., Cesarini, D., Dawes, C.T., Fowler, J.H., Johannesson, M., Magnusson, P.K.E. & Teorell, J. (2014). Linking genes and political orientations: Testing the cognitive ability as mediator hypothesis. *Political Psychology*, early online version.

Rindermann, H., Flores-Mendoza, C., & Woodley, M. A. (2012). Political orientations, intelligence and education. *Intelligence*, 40, 217–225.

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.

Solon, I. (2014). How intelligence mediates liberalism and prosociality. *Intelligence*, 47, 44–53.

Stankov, L. (2009). Conservatism and cognitive ability. *Intelligence*, 37, 294–304.

Urbatsch, R. (2012). The paradox of voting intelligently. *Public Choice*, 150, 511–524.

Woodley, M. A. (2011). Problematic constructs and cultural mediation: A comment on Heaven, Ciarrochi and Leeson (2011). *Intelligence*, 39, 245–248.