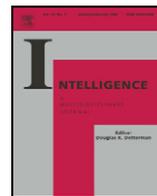


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Political orientations, intelligence and education

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ABSTRACT

The social sciences have traditionally assumed that education is a major determinant of citizens' political orientations and behavior. Several studies have also shown that intelligence has an impact. According to a theory that conceptualizes intelligence as a *burgher* (middle-class, civil) phenomenon – intelligence should promote civil attitudes, habits and norms like diligence, order and liberty, which in turn nurture cognitive development – political orientations should be related to intelligence, with more intelligent individuals tending towards less extreme political orientations. In a Brazilian sample ($N=586$), individuals were given the Standard Progressive Matrices (SPM) and a questionnaire measuring age, gender, income, education and political orientations. Firstly, intelligence has a positive impact on having *any* political opinion. Among persons with opinions those with the highest IQ's were found to be politically center-right and centrist respectively. The relationship held after correcting for gender, age, education and income. In a path-analysis, only intelligence had a positive impact on political centrality, whereas education promoted orientations that were farther from the center. These results are discussed in the context of results from other studies in different countries and in the context of different theoretical models on the relationship between political attitudes and IQ.

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1. The relationship between education, intelligence and political orientations

1.1. Education and intelligence as enhancers of rationality, political competence and liberalism (the enlightenment model)

The assumption that there exists a relationship between intelligence on the one hand and political worldviews, political institutions, political orientations and political behavior on the other is both a research topic with a long tradition, and a contentious social issue. Among psychologists Godfrey H. Thomson made the first explicit statement on the impact of intelligence on politics and vice-versa (1937/1936): He assumed that intelligence would further civilization in both its technical

and in its cultural, ethical and political aspects. Conversely, he suggested that totalitarian ideologies (such as fascism and communism) would decrease per capita intelligence through their tendency to “drive away intelligent men from the country” (2009, p. 59). This sentiment was later confirmed by the flight of scientists and intellectuals from National Socialist Germany (according to Möller, 1984, around 50% of all notable scientists) and by the deleterious impact on the human capital of Communist countries (especially USSR, China and Cambodia) through selective emigration and political murder (according to Glad, 1998, a loss of 6% of people with IQ higher than 130 resulted from the policies of the Soviet Union). In addition to the ways discussed by Thomson, there are other ways in which these politics could also have had a deleterious effect on intelligence: War, dictatorship and totalitarian ideologies could reduce the quality and quantity of conditions relevant for optimal cognitive development and knowledge acquisition, such as nutrition, health care, stable parenting, educational opportunities, rule of law and liberty (e.g. DeGroot, 1951; Pesonen et al., 2011; Rindermann, 2008).

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It is worth noting that the idea that there is an influence on political orientation and behavior stemming from thinking ability and knowledge can likely be traced back to Socrates and his assumption that evil results from ignorance. A similar theory holds that for democracy to function effectively, citizens must be intelligent, knowledgeable and rational, with the last two being contingent upon intelligence. Intelligence helps citizens comparing and evaluating the sorts of observations and information that they need to acquire and to finally come to reasonable political decisions (e.g. Vanhanen, 2009).

Longitudinal studies support the theory that intelligence has an impact on political orientations and behavior (Deary, Batty, & Gale, 2008a, 2008b): British people with higher childhood intelligence expressed in adulthood a greater interest in politics characterized by more liberal and anti-traditional attitudes. They were also more likely to participate in elections and to engage as citizens in demonstrations and petitions. These attitudes and behaviors seem to form part of a more general pattern of *cognitive rationality* including the formation of more reasonable worldviews (Oesterdiekhoff & Rindermann, 2007): According to Meisenberg (2004) intelligence constitutes the foundation of rational and autonomous thinking and behavior in responsible citizens: “The causal arrow is likely to point from the latent trait ‘intelligence’ to a rational, non-traditional system of beliefs and values. As people get brighter they develop a habit of critical thinking, questioning religious dogmas and other sources of traditional authority. Being able to understand the nature of politics, people in modern societies are not easily manipulated by the ruling elite.” (p. 139) A similar phenomenon has been described by Lynn, Harvey, and Nyborg (2009), Nyborg (2009) and Bertsch and Pesta (2009) in the case of religious questioning and scriptural acceptance: In all cases it was found that higher intelligence leads to more rational worldviews, less intense religiosity, less stereotyped thinking and less dogmatism.

The idea that intelligence has a positive impact on political behavior is not only assumed to be significant for *citizens* as voters and decision-makers in local politics, but also for *politicians* as decision-makers in governments and parliaments (Thorndike, 1936): According to Simonton (2006) cognitive ability (“intellectual brilliance” or “IQ”) has a significant positive influence on the performance of US presidents ($r=0.56$ and 0.33). In a case study on a Scottish king (Robert the Bruce) Deary et al. (2007) present further evidence for a positive impact of high intelligence on *governmental competence*. At the level of international comparisons, using education as an indicator for the cognitive ability of leading politicians, Rindermann, Sailer, and Thompson (2009) showed that the cognitive ability level of chief executives had a positive longitudinal impact on the cognitive development of nations. Of course, government effectiveness not only depends on the ability level of chief executives, but indirectly also on the nation’s broader ability level as expressed in the shaping of culture, rational electoral decisions and competent officials (e.g. McDaniel, 2006).

1.2. Intelligence and political orientations in the left–right or centrality-extremist dimension

According to Adorno, Frenkel-Brunswik, Levinson, and Sanford (1950) political positions widely regarded as

being unethical (such as authoritarianism) are related to a (pre-fascist) authoritarian personality structure, which is specific to right-wing-attitudes. Eysenck (1999/1954) saw more generally politically extremist positions on both the right and the left as associated with authoritarianism. Within the intelligence research literature, there does exist data supportive of what could be termed the ‘centrist-extremist theory’ of Eysenck. According to Nyborg (2009), while lower intelligence leads to dogmatism and rigidity on both the political right and left, it does not influence the tendency towards embracing more rightist or leftist values. For worldviews Lynn et al. (2009) assumed a similar pattern: Strong religiosity is an indicator of lower intelligence, as is discipleship to communism. In their view the two worldviews share a common element – dogmatism.

Stankov (2009) recently presented data on the relationship between political orientation and IQ, which is interpreted as supportive of the authoritarian personality model of Adorno et al. (1950): He found that conservatism scores are negatively correlated with intelligence in individual differences samples derived from within the US and across countries. Heaven, Ciarrochi, and Leeson (2011) also showed support for this in their finding of a negative relationship between right-wing authoritarianism and intelligence. Other research (see: Katz, 1990; Kemmelmeier, 2008) has found mixed evidence including positive correlations between IQ and adherence to certain right-wing views.

Deary et al. (2008b) presented data on a UK sample that support the centrist-extremist model of Eysenck: The study found that when the three major British parties are compared the supporters of the centrist Liberal Democrats exhibited the highest childhood intelligence (in the 2001 and 2004 political support surveys a mean IQ of 107.55; p. 554, and corrigendum, 2009, p. 325), followed by the supporters of the Conservatives (IQ 103.40) and Labour (IQ 102.30). The only party perceived as extremist in the survey was the British National Party (vote percentages of around 0 to 2%), whose supporters scored an average IQ of 97.90 (a communist party which would have made an interesting comparison is missing). An explanation for this is that more centrist orientations correspond with flexible thinking (enabled by intelligence) and that more extreme orientations correspond with rigidity and dogmatism.

1.3. Intelligence as a burgher–civil phenomenon

A new theory sees intelligence as an integral element of middle-class ways of thinking and living (Rindermann, 2009). “Middle-class”, “burgher”, “bourgeois”, “civic” or “civil” attributes (the terms can be used interchangeably) comprise certain worldviews, forms of society, individual lifestyles and personality traits. These include:

- *Diligence* (achievement motivation).
- *Order* (predictability; reliability; fair-mindedness; emotional regulation, temperance and moderateness; long-term marriage and familial stability; and rule of law in politics).
- *Meritoric orientations* (acknowledgment of and gratification derived from accomplishment; merit-based criteria

used in the distribution of jobs, income, and reputation; and use of achievement measurement).¹

- *Appreciation, education and use of thinking, knowledge and rationality.*
- *Efficient-thrifty use of resources* (in terms of time, raw materials and people).
- *Realism and pragmatism* (realistic orientation in the world and in life; no extremism in thinking and life; common sense, adaptability, functionality, compromise, and foresight).
- *Rule of law* (law-abiding behavior; institutions; human rights and property rights).
- *Functional government* (government and administration are orientated towards pragmatic and ethical norms).
- *Autonomy and freedom* (self-responsibility in terms of the individual, family, economy and society, which must sustain themselves).
- *Burgher worldviews* (*weltanschauung* or orientations that contain the aforementioned attributes as norms and descriptions; e.g. rationality, liberty, and equality).

Such a concept of a civil worldview was first explicitly described by Leon Battista Alberti (2004/1441), although thinking on this issue can be traced back to Thomas Aquinas and Aristotle. It developed in cities and in the merchant milieu and then spread as a component of modernity within societies (Sombart, 1915/1913). Today it is common in many regions and milieus of the Western world, in East Asia and increasingly in developing countries. The occurrence of certain aspects and the general development of this worldview vary depending on country, culture and time.

We assume that intelligence supports the development of this pattern of thinking and living, described here as the *burgher–civil phenomenon*, which in turn reinforces cognitive abilities. Empirical support: *Diligence* and *discipline* at school support the development of cognitive competence, especially in its knowledge aspects (Heller, Rindermann, & Reimann, 2010; Rindermann & Ceci, 2009). Living in a *complete and stable family* (two parents living together) has a positive influence on the cognitive ability of children (e.g. Armor, 2003). Education has a positive impact on the stability of marriage and a negative impact on the frequency of out of wedlock births (Barnett, 1985). Furthermore there is evidence that intelligence has a promoting effect on this pattern of living (Gottfredson, 2003). The same holds true for the relationship between education, intelligence and *norm-abiding behavior*: Education furthers compliance with (justifiable) norms (Barnett, 1985; Cunha, Heckman, Lochner, & Masterov, 2006); this is also true for intelligence (Ellis & Walsh, 2003). Education and cognitive ability also have a positive impact on the establishment of *democracy, rule of law, and political liberty* (Rindermann, 2008), furthermore *government effectiveness* is nurtured by ability (Deary et al., 2007; Rindermann et al., 2009; Simonton, 2006). Cognitive ability is assumed to further *ethical thinking* and by the same token ethical behavior (Kohlberg, 1987; Piaget, 2008/1932). Intelligence enhances preference for *liberty* as manifest in support for policies associated with *limited government* and for the operation of *meritoric*

principles in the economy (Caplan & Miller, 2010), both of which are classical *burgher* orientations. *Economic freedom* again has a positive impact in international comparisons on the cognitive development of nations (Rindermann, 2008). In the case of many of these attributes there exists an apparent correspondence between a conscientious-moderate orderly way of thinking and a conscientious-moderate orderly way of living, qualified as *justifiable order* combined with *justifiable freedom*, both in a moderate and pragmatic intensity.

Translated into *political attitudes*, education, intelligence and knowledge should support reasonable *interest* (not disinterest or exaggerated interest) in political matters, as an expression of rational self-interest, as an insight into the fact that society requires the engagement of citizens for its success, and as an expression of a normative pattern. As mentioned previously, such individuals should also favor attitudes conducive to *functional* and *reasonable democracy, rule of law, political liberty, and tolerance*, as these improve the quality of life for individuals and of the country (rational self-interest) and because they increase the likelihood of living in an ethically justifiable political system. Such attitudes should lead to political preferences for a civic society characterized by support for *education*, a willingness to tackle *crime* (including prevention and support for law and order), support for *families*, for *meritocracy*, and *pragmatic politics*, which combine to stabilize, protect, and further the quality of life.

In the context of preference for *political parties*, education, intelligence and knowledge should lead individuals to favor such parties, which promote or seem to promote the above mentioned political aims. Depending on the country and the period in time, these parties might be found in the center or either slightly to the right or left of center, but rarely at the extremes: Parties standing for religious-traditionalistic worldviews (such as belief in the inerrancy of holy texts or in creationism) are not compatible with an intelligent-rational worldview (e.g. Lynn et al., 2009; Meisenberg, 2004; Nyborg, 2009). Similarly a preference for communism and communist parties is not compatible with an intelligent-ethical worldview, despite the fact that in the past they have been supported by a minority of influential intellectuals outside of Communist regimes (e.g. Jean-Paul Sartre). The worldview of communism also does not resonate with the self-interest of average citizens (e.g. Kołakowski, 2005/1976). The same is true of fascist parties as these parties and ideologies do not accord with rational self-interest, in addition to being objectionable on ethical grounds. This does not mean that cognitive ability always leads to all individuals disapproving of these ideologies. It only improves the ability of individuals to identify the detrimental consequences of the anti-rational and unethical positions adopted by these ideologies and parties. Furthermore it is acknowledged that additional factors like *autonomy* are important in the development of political preferences: Communism as well as fascism (and their ideological derivatives) are collectivist ideologies, which are contrary to the more individualistic (classically liberal) orientations prevailing in civil worldviews (Hayek, 1944; Mises, 1949).

Thus, in a combination of insight, interest, ethics and cultural affinity, education, intelligence and knowledge would be expected to favor *centrist parties*, rather than extremist ones. What is “centrist” could depend on time and local

¹ We use the term “meritoric”, not “meritocratic” to stress the meaning “gains by competence and achievement” and not “reign of the best”.

conditions and lead in given situations to parties slightly more towards the right or left. Presumably in the 19th century *center to center-left parties* were more in favor of civil politics (e.g. equality between people and peoples, between the sexes, and general education for all), and presumably today in European countries, *center to center-right parties*, which tend to support relatively more meritoric principles, stronger autonomy, order and pragmatic–realistic politics. For people, who have the potential to be successful in a society via above average intelligence, it would be expedient to prefer parties that support the orientation of a society towards meritocracy, individual autonomy, and law-abidingness.

Evidence for this model comes from the UK study of Deary et al. (2008b): Supporters of the centrist and center-right parties had higher childhood IQ than those that supported the center-left party, or the few ($N=69$) individuals in the sample who supported the nationalist party (IQs of 107.55 and 103.40 for the supporters of the Liberal Democrats and Conservatives respectively vs. IQs of 102.30 and 97.90 for the supporters of Labour and the BNP respectively). This result is corroborated by an older study by Eysenck (1999/1954, p. 20) who found that amongst a UK sample, supporters of the Conservatives and Liberals had on average higher levels of education (as a proxy for intelligence – with the supporters of the Conservatives averaging slightly higher than the supporters of the Liberals) than supporters of Labour. Similarly using education in a sample from The Netherlands (Werfhorst & Graaf, 2004, p. 226) a low educational level increased the probability of voting for a left-wing party, whereas a high educational level (as indicated by university attendance) decreased it. Support for this position might also be found in the studies of Katz (1990), Kimmelmeier (2008) and Caplan and Miller (2010).

Finally, in Germany (in a sample of 16 states – “Bundesland”) states governed by center-right parties (CDU/CSU) exhibit higher IQ means: The state governments are voted for by the majority of the states’ citizens, and can control educational policy (e.g. the use of centralized exams and high-stakes tests, the education of teachers, disciplinary culture etc.). The mean cognitive abilities of students and young adults are derived through student assessment and IQ tests (PISA, PIRLS, intelligence tests for conscripts – 1990s to 2009). States that are predominantly (in the long-term) governed by center-right parties (CDU/CSU: Baden-Württemberg, Bavaria, Saxony, Thuringia) attained a mean IQ (values transformed to IQ scale) of 101.08; states governed by center-left parties (SPD: Brandenburg, Bremen, Hamburg, Hessen, and North Rhine-Westphalia) attained a mean IQ of 97.35.

In summary, cognitive ability (intelligence, knowledge and the intelligent use of knowledge) influences political orientations by permitting individuals greater insight into which politics better permit them to attain goals based on both rational self-interest and the interests of society; via acknowledging the ethical consequences of political action; and via an affinity for cultural norms and perspectives resembling their own preferences. Intelligence is embedded in a nomological net of *burgher* values, it supports them while at the same time they support intelligence, which leads to a preference for politically centrist orientations favoring a stable and free civil society. While empirical support can be found from studies involving two European countries, support from

studies involving developing countries is lacking. Thus the thesis should be tested in an educationally and socially well-developed milieu from a developing country permitting the main assumptions of the model to be tested.

2. Method

2.1. Sample and subjects

In a Brazilian sample collected between 2006 and 2009 $N=586$ individuals (aged 15 to 53, mean age 20.08 years, $SD=7.24$; 295 men, 50%, 291 women, 50%) were given a psychometric intelligence test and an anonymous questionnaire. The sample was recruited at public high schools, public and private universities and at centers of psychological assessment for acquiring driving licenses or for applicant selection for jobs in Minas Gerais by the Laboratório de Avaliação das Diferenças Individuais (Laboratory for the Assessment of Individual Differences) of the Universidade Federal of Minas Gerais in Belo Horizonte, Brazil (UFMG, Federal University of Minas Gerais), with the aim of measuring intelligence and its relationship with different important variables (e.g. sex, education, wealth). Minas Gerais is a state in the center of Brazil with above average GDP and Human Development Index. The mean IQ of this sample was according to US norms from 1993 for 20 year olds around 97 ($M=96.76$, $SD=15.94$; uncorrected for the Flynn Effect; to show possible influences of age separate norms for older individuals were not used. Thus the sample is quite average (around 100) when compared with IQ norms in a developed country. Other studies (Brouwers, Vijver, & Hemert, 2009; Lynn & Meisenberg, 2010; Rindermann, 2007; Rindermann et al., 2009), using different tests and measurement points found mean IQs for Brazil of between 72 (Brouwers et al.), 82 (Rindermann et al.), 84 (Rindermann) and 87 (Lynn & Meisenberg). Only 4% of the sample had just primary school education, the rest had at least a secondary education and 16% had a university education. This sample is less representative of the Brazilian population at large in terms of education and intelligence; but it is comparable with the populations of industrialized countries and it permits the relationships between political orientations and intelligence to be studied.

2.2. Instruments and variables

As a measure of *intelligence*, the Standard Progressive Matrices (SPM; Raven, Raven, & Court, 2003/1938) were employed. 25% of the sample were found to have an IQ (in terms of 1993 US-norms) of below 85, 27% were found to be between 85 and 100, 38% were found to be between 100 and 115 and 10% had IQs higher than 115. *Education* was measured by a questionnaire in three increments: Primary education (4%), secondary education (high school; 80%) and university (16%). A self-rating procedure was used in measuring *political orientations* in which there were six categories: Without preference (56%), left (11%), center-left (8%), center (15%), center-right (5%) and right (5%) (In the original Portuguese this read as: “Qual é a sua crença política?, Esquerda, Centro-esquerda, Centro, Centro-direita, Direita, Não tenho”). The group was somewhat skewed to the left (19% vs.

10%).² This measure was also transformed using a *middle vs. margin* measure (here without preference was excluded, left and right were coded as 1, 36%; center-left and center-right as 2, 30%; center as 3, 34%). In a second version we constructed a dichotomous variable *having a political preference or not*. Family income (own and of others of the family together) was measured in multiples of minimal salary (“*salario minimo*”): 4% of the sample was earning the minimal salary (around 200 US \$ per month), 43% were earning between 200 and 1000 US \$, 30% were earning between 1000 and 2000 US \$, 16% were earning between 2000 and 3000 US \$ and 7% were earning more than 3000 US \$. Income as an indicator of wealth and social status is important as a control in analyses of the relationship between intelligence and political orientations because past research has shown across countries and decades that there exist stable correlations between wealth/status and political orientations (Deary et al., 2008b; Eysenck, 1999/1954, p. 17, 30 f.). In the words of Eysenck (p. 236): “Middle class groups tend to be conservative, working class groups radical. This would almost certainly mean that over the whole population intelligence would show a slight positive correlation with Conservatism.”

2.3. Statistical analysis

Simple descriptive statistics have been used, along with posthoc tests (Duncan and Tukey) and path analysis (using Mplus 5.21, FIML [Full-Information-Maximum-Likelihood], all data are used). To correct for possible influences of sex/gender, age, education and income, these variables were excluded using regression (regressing SPM on sex, age, education and income, taking the residual, renorming to the old mean and standard deviation). After this correction means for the six political orientation categories were again calculated. These variables were also controlled in a path analysis.

In the second analysis we used “having a political preference or not” as the dependent variable. For a dichotomous dependent variable we applied in Mplus WLSMV (weighted least square parameter estimates using a diagonal weight matrix with standard errors and a mean- and variance-adjusted chi-square test statistic using a full weight matrix), which allows us to interpret the regression coefficients as standardized coefficients comparable to the other coefficients in the model, so-called probit regression coefficients.

3. Results

Individuals (see Table 1) preferring a center-right *political orientation* have the highest mean IQ (105.29). The second highest mean IQ is found amongst those of a centrist political orientation (102.53). This is followed by those preferring a center-left orientation, who possess an IQ mean of 100.67, who are followed by those clearly on the left who possess

² According to Singer (2003) the meaning of political left/right orientations revolves around governmental intervention in economy. The “right” opinion wants governmental intervention only for controlling currency and credit system. Everything else should be left to the market. The “left” or socialist opinion advocates a strong welfare-system providing public education, health care and welfare to the entire population, which requires a progressive tax system.

an IQ mean of 97.57 and finally by those clearly on the right, who possess an IQ mean of 95.20. But the lowest IQ mean is found amongst those having no political preference at all (IQ 93.85). In an analysis of variance the factor political orientation is statistically highly significant ($df=5, 580, F=7.082, p<0.000, \eta^2=0.058$ equivalent to $R=0.24$). Using posthoc tests (Tukey, 5% significance level) the group with no political preference is significantly different from the other groups with the exception of those clearly on the right and left. By centrist-grouping the center and center-left–right groups were significantly different (Tukey) from no-orientation, and the right and left together. The large share of a no-opinion group is astonishing, it differs not in age from the general mean (without preference, mean age $M=20.41$ years, $SD=7.48$, total group $M=20.08$ years, $SD=7.24$). Similar large groups with no preference are found also in larger surveys (Souza Carreirão, 2007, p. 314, in the 2006 survey 42% without preference). Due to an increasing ambivalence towards politicians and their performance (for example different parties and politicians, such as the former presidents Cardoso and da Silva/Lula are perceived as espousing the same politics) many Brazilians are less interested in politics.

Men had a slightly more left-wing orientation than women (for the left: 23% vs. 17%), but the largest difference is in the no-orientation category, where women are overrepresented: (51% of men vs. 61% of women).

More highly educated people tended to fall into the left category. If we do not consider the “without orientation” category, 68% of the sample with university education is left (left and center-left vs. 29% right), but only 40% of the sample with secondary education and 50% with primary education are left oriented. One factor could be that due to the experience of decades of military governments Brazilian academics tend to left-wing “oppositional” orientations.

Age seems to be nearly irrelevant: Older people seemed to be a little bit more left (for both of the left categories together, the mean age was: 21.21 years; right: 19.48). The youngest group was found predominantly in the center category (17.71 years), but the differences were not large.

Income is somewhat differently distributed: People in the center-right (631 US \$) and center-left categories (588 \$) had the highest family income, followed by those in the left (566 \$), center (543 \$), without (540 \$) and finally right categories (515 \$).

If we correct (using the residual of a regression) the results for sex/gender, education, age and income the pattern of results remains the same (see Table 1): Center-right oriented individuals have the highest IQ, followed by center, center-left, left, right and without preference.

Putting the extreme or marginal positions together (left and right, center-left and center-right, center) the center group has the highest IQ (102.53), followed by center-extreme (102.29) and extreme (96.82). Corrected for sex/gender, education and age the pattern is slightly clearer (center 102.83, center-extreme 100.69, extreme 97.19). The differences are significant for center and center-extreme vs. extreme.

In a model using all analyzed variables and with the criterion centrist political orientation (no preference omitted) only intelligence shows a positive effect on the degree of political centrism (no corrected values, good fit with $CFI=0.96$,

Table 1
Intelligence means according to political orientation.

Political orientation	SPM mean (SD)	SPM mean (SD) (corrected)	Political centrality	SPM mean (SD)	SPM mean (SD) (corrected)
Without preference (56%)	93.85 (15.98)	94.13 (15.46)	-	-	-
Left (11%)	97.57 (15.98)	98.38 (16.67)	Left and right (36%)	96.82 (15.26)	97.19 (15.88)
Center-left (9%)	100.67 (14.35)	98.99 (17.17)	Center-left-right (31%)	102.29 (15.23)	100.69 (16.80)
Center (14%)	102.53 (14.52)	102.83 (14.92)	Center (33%)	102.53 (14.52)	102.83 (14.91)
Center-right (5%)	105.29 (16.59)	103.83 (15.94)	-	-	-
Right (5%)	95.20 (13.59)	94.36 (13.70)	-	-	-

Notes: IQ-norms from US-sample 1997. $N = 586$ and $N = 278$. "Corrected": corrected for sex/gender, age, education and income.

SRMR = 0.03, FIML, $N = 565$ to 586 for predictors, $N = 261$ for political orientations, see Fig. 1). Intelligence increases the degree of centrism ($\beta_{Int \rightarrow CPO} = 0.18$), whereas education has a negative impact ($\beta_{Edu \rightarrow CPO} = -0.19$), meaning that it increases the degree to which individuals move further away from the center, the other effects are small to negligible: Age ($\beta_{Age \rightarrow CPO} = -0.10$), sex/gender ($\beta_{Sex \rightarrow CPO} = -0.05$) and income ($\beta_{Age \rightarrow CPO} = -0.01$). The last two variables could be removed from the analysis; they were included simply to demonstrate their irrelevance. Intelligence is the single factor positively influencing centrist orientation; the others operate by influencing deviation away from the center and towards the more extreme positions.

Education has a comparatively strong statistical effect on intelligence ($\beta_{Edu \rightarrow Int} = 0.33$; on the direction of effects see below), there is also an influence from age on intelligence ($\beta_{Age \rightarrow Int} = -0.34$). In both cases the beta-coefficients were larger than the bivariate correlations (suppressor effects). Education (for age) as well as age (for education) absorb criterion-irrelevant variance increasing the predictive validity. The positive relationship between education and intelligence is actually higher than $r = 0.26$ ($\beta_{Edu \rightarrow Int} = 0.33$, correlation with age partialled out: $r_p = 0.34$) because "age" has a distorting effect: This may have come about in two ways, firstly, as a consequence of modernization in a developing country like Brazil older, but intelligent individuals have less education because decades ago going to school and university was less common than today. Age is therefore basically a proxy for a variety of relevant causal variables such as age cohort and educational growth/modernization. Secondly, intelligent individuals tend not to have attained the highest level of education prior to turning 30. The same is true for the negative relationship between age and intelligence ($r = -0.28$): The actual negative relationship as indicated by the beta-coefficient or partial correlation ($\beta_{Age \rightarrow Int} = -0.34$, correlation with education partialled out: $r_p = -0.35$): This may be due to biological processes (e.g.

slowing down of mental speed with age) or the secular rise of intelligence in younger generations. This pattern of interpretation could also be applied to understanding the suppressor effects between education and income and age and income (e.g. the positive relationship between education and income is masked by the lower educational level of older people). The positive relationships with around $r = 0.20$ to 0.30 between education and income and between intelligence and income underscore the validity of the data.

A bi-directional path was assumed to exist between family income and intelligence (in the model this was operationalized via correlated errors). In studies conducted in different countries (including Brazil) parental wealth has a small positive impact on children's intelligence, but the effect of parental education is larger (Rindermann & Thompson, 2011). Parental education - if parental intelligence is not included in a model - encapsulates educational experience and intelligence (both acquired and genetically transmitted). Additionally, the relationship between family income and intelligence incorporates not only parental effects, but also the effects of the individual's ability on income. In summary, the effect of intelligence on income is larger than the other way around. To assume a bidirectional effect is the more cautious assumption however. The effects on political orientations are not affected by this relationship.

A unidirectional path was set between education and intelligence ($\beta_{Edu \rightarrow Int} = 0.33$, $r = 0.26$, $r_p = 0.34$). Own and parental education further cognitive ability, thinking ability and fluid intelligence as well as knowledge and crystallized intelligence (e.g. Ceci, 1991; Rindermann & Ceci, 2009; Rindermann & Heller, 2005; Rindermann, Michou & Thompson, 2011). But intelligent individuals also spend more time in school and acquire higher educational degrees (e.g. Deary et al., 2008a; Murray, 2008). As a result of this (presumably smaller) reverse effect (indicated in the figure by a dotted arrow) the unidirectional path could overestimate somewhat the influence of

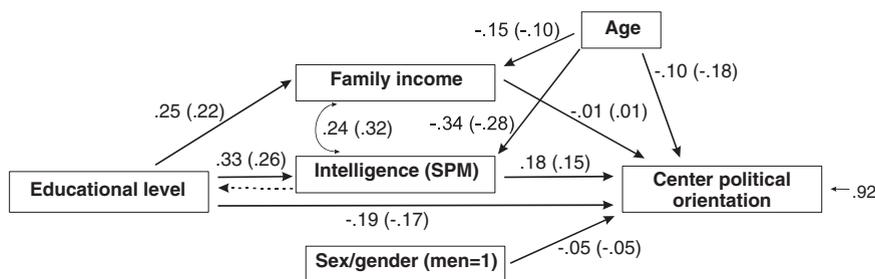


Fig. 1. Effects on political centralism (standardized path coefficients, correlations in parentheses, correlated error between intelligence and family income, error term as non explained variance on the right, FIML, $N = 261$ to 586).

education. Nevertheless, if the direction of the path is inverted or set as bidirectional, the consequences for the impact of intelligence on political centrism remain unchanged.

The main message of the model is the positive impact of intelligence and the negative impact of education on the centrism of political orientations.

If we use having a political preference or not (dichotomous dependent variable using in Mplus WLSMV) as the dependent variable, instead of political orientations, the variable with the largest positive impact is intelligence ($\beta_{\text{Int} \rightarrow \text{HaveP}} = 0.20$, $r = 0.20$) followed by sex ($\beta_{\text{Sex} \rightarrow \text{HaveP}} = 0.12$, $r = 0.12$, more males have a political preference), income has a zero-effect ($\beta_{\text{Inc} \rightarrow \text{HaveP}} = 0.00$, $r = 0.05$), age and education have negative effects ($\beta_{\text{Age} \rightarrow \text{HaveP}} = -0.14$, $r = -0.22$; $\beta_{\text{Edu} \rightarrow \text{HaveP}} = -0.32$, $r = -0.25$). Intelligence is therefore crucial for developing a political opinion.

4. Discussion

Intelligence is positively related to *caring about politics*, individuals having the lowest IQ (uncorrected for sex/gender, age, education and income IQ 94, corrected 94) independent from wealth show no preference. This probably results from little interest leading to limited information on political issues and both could be based on lack of ability necessary to comprehend cognitively demanding political issues. Low intelligence, not making any political decisions or limited interest in political issues do not help citizens acting in a responsible way. If having any opinion intelligence is positively related to *centrist political orientations* (IQ 103/103). Those whose orientations are clearly right (IQ 95/94) and clearly left (IQ 98/98), center-left-right together (IQ 102/101) or clearly left-right together (IQ 97/97) possess (independently of controlled potential biasing variables) lower average intelligence. Center political orientation benefits only from intelligence, with no contributions from age, income, and sex. Education does clearly exert a biasing influence towards more politically circumferential orientations. Education could be misleading, because education as a proxy of ability, might exert a “burgher” influence. Its non-ability-aspects (such as peer effects, authority effects from teachers or effects on personality) might however work in such a way that favors the development of more ‘eccentric’ orientations (Woodley, 2010, 2011). The highest cognitive ability independent of income (as an indicator of wealth and socio economic status), gender, age and education is seen amongst individuals with a preference for *center-right* orientations (uncorrected IQ 105, corrected IQ 104). The finding of an influence of intelligence on the degree of political centrism and on center-right political orientation accords with the British data from Deary et al. (2008b) and with education as a proxy of ability in older British and younger Dutch data and also with cognitive ability data at the state level within Germany.

Intelligence theory assumes that cognitive ability impacts political attitudes and behavior: Intelligence enhances the ability to understand, to learn from experience, to organize information, to draw conclusions and to anticipate consequences. The rationality in thinking, attitudes and behavior and the consideration of the ethical aspects of decisions are all subsequently enhanced. Indirectly, through shaping society and leaders, institutions and culture, the development of a climate of rationality is supported. Thus extremist positions,

often necessarily simplifying the world, which often lead to detrimental consequences for individuals and societies, are less preferred. Intelligence helps to realize that it is recommendable to pay attention to politics because politics influences individual lives and the fates of societies. Finally intelligence is embedded in a burgher world-view, additionally fostering the described modest-centrist positions.

4.1. Historical mediation and limitations

The burgher-enlightenment-theory is however less able to explain differences within a common democratic spectrum, such as those that exist between Center-Left/Social-Democrats/Labour and Center-Right/Christian Democrats/Conservatives in the present. We assume until around the middle of the 20th century in the majority of Western countries, center and center-left parties were more closely connected to certain important aspects of civil orientations (such as equality and the idea of universal education or health care), today however crucial attributes of civil orientations (i.e. meritocracy, autonomy, achievement orientation, order) tend to be associated with center and center-right parties by contrast. This could explain the slight but stable difference in intelligence of the supporters between center-right and center-left parties in three countries: UK, Germany, and Brazil, and in our Brazilian sample also after controlling for further variables, especially the most important background variable – income.

Also worth discussing are the implications of these findings for alternatives to the *Burgher-civil theory*. Kanazawa's (2009, 2010) *savannah-IQ interaction hypothesis* would predict that amongst the sample IQ should be positively correlated with leftist orientations, owing to the seeming evolutionary novelty of political orientations that emphasize altruism towards non-genetic kin. This hypothesis is however falsified in the context of this sample by the finding that intelligence is positively predictive of centrism and center-right orientations, associated with the *burgher* worldview, which emphasizes meritocracy and self-reliance rather than ‘evolutionarily novel’ forms of egalitarian redistribution to non-kin. Additionally, in the US “conservatives”, compared to “liberals”, donate more money for charity, also controlled for wealth (Brooks, 2006).

The *cultural mediation hypothesis* of Woodley (2010, 2011) is by contrast more compatible with the findings of this study (and others). The cultural mediation hypothesis predicts that intelligent individuals will be better at identifying and (via heightened effortful control) espousing the values that are normative to a given society at a given point in time (rational in a utilitarian sense). Therefore the degree to which high-IQ corresponds to either left or rightwing attitudes is a function of the normative center of gravity in a culture, with rightwing attitudes being more common amongst those with high-IQs in countries with less equally distributed resources and a ‘materialist’ values system (such as Brazil). While the cultural mediation hypothesis makes less sense of the findings of positive correlations between IQ and center-right (vs. center-left) preferences amongst contemporary Western samples (e.g. Deary et al., 2008b), it does provide one possible explanation for our finding that education was a significant positive predictor of the development of ‘eccentric’ leftist political orientations amongst the sample.

The differences between those with center, center-right and center-left orientations in intelligence are not large in the case of the UK, Germany, and Brazil samples (ranging between one to four IQ points). There are large overlaps and presumably within the different political spectrums the forms, complexity and rationality of convictions vary based on intelligence. Therefore more cognitively complex and rational ways of being (very) right wing (i.e. traditional, conservative, often religious) and (very) left wing (i.e. progressive, communist) are conceivable (Sidanius, 1985). Further research using cognitive ability and personality tests should investigate this. Depending on the country (e.g. USA, Israel vs. Scandinavia, West or East Asia or developing countries), time (second half of the 20th century vs. the first half) and sometimes the leading figures in parties, individual preferences for orientations are likely to vary according to the proximity of parties in a given political spectrum to *burgher-civil* values.

Genetic effects were not measured in our study. Further behavioral genetic research could examine the question of whether the nomological net of cognitive ability and political preferences is associated with common genetic factors. For instance, intelligence and moderation can have a survival value leading to more offspring (e.g. Clark, 2007). Finally we have not taken into consideration personality traits. Chirumbolo and Leone (2010) recently demonstrated in a review involving an Italian sample that Conscientiousness is linked to right-wing orientation whereas Openness to Experience is associated with left-wing orientation. As both could support cognitive ability (Conscientiousness via diligent and structured learning; Openness to Experience via open-mindedness towards new and ambiguous information) a combination of both, Conscientiousness and Openness to Experience would seem to permit an optimal “polar integration” of both “rightist” and “leftist” attitudes. It would appear to be the case that belonging to either the contemporary right or left in politics is not what is important, what matters is utilizing information and properly evaluating arguments in finding the most rational solutions, as these contribute to the most justifiable position among a range of political issues. For this task intelligence is useful.

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