Research Paper

Exploring exceptional minds: Political orientations of gifted adults

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A B S T R A C T

Gifted individuals are influential in shaping the success of societies in areas such as economics, science, and politics. However, prior research on the relationship between intelligence and political orientations yielded inconsistent results. The political orientations of gifted adults remain yet underexplored. Therefore, we examined the political orientations of gifted and non-gifted adults using both, a single-dimensional left-right self-placement and a multi-dimensional questionnaire. From 7023 non-preselected third graders, gifted students (IQ $\geq$ 130) and a matched sample of non-gifted students (IQ $\approx$ 100) were initially identified and re-identified in ninth grade following another intelligence testing within the scope of the Marburg Giftedness Project. About 35 years after the initial identification, 87 gifted and 71 non-gifted adults participated in our follow-up survey. In a 2 × 2 ANOVA with the independent variables giftedness and the control variable sex, no significant effects were found in the left-right self-placement. In a 2 × 2 MANOVA and subsequent ANOVAs with the four scales of the multi-dimensional questionnaire (economic libertarianism, liberalism, conservatism, socialism), no significant main or interaction effect emerged, except a significant interaction effect of giftedness and sex for conservatism. Specifically, non-gifted men showed higher conservatism scores than gifted men, whereas gifted and non-gifted women did not differ significantly. The results from supplementary Bayesian analyses were in accordance with these interpretations. The relevance of these findings is discussed, underscoring the nuanced relationship between giftedness and political orientations.

1. Introduction

Despite the presumed importance of gifted individuals for political leadership and societal advancement, the political orientations of gifted individuals remain an underexplored area of inquiry. In contrast to this limited research, giftedness is significantly linked to various beneficial psychological and social outcomes (e.g., Lubinski et al., 2023; Preckel et al., 2024; Rost, 2009a). According to the Cognitive Complexity-Openness Hypothesis, higher intelligence is linked to greater openness to complex and nuanced political orientations (Van Hiel et al., 2010), which may in turn be reflected in distinct political orientations among gifted individuals. Therefore, we seek to uncover the political orientations of gifted adults.

Generally, political orientations are crucial for understanding how individuals engage with societal structures, especially given their role in shaping political actions (Jost et al., 2009). Since higher intelligence can influence an individual's worldview and decision-making processes, potentially leading to more nuanced political orientations (e.g., Deary

et al., 2008a), researching political orientations in gifted adults is a promising endeavor. Based on the closed conceptual relation of intelligence and (intelligence-based) giftedness as well as a lack of studies investigating political orientations in gifted populations, we report results concerning the relations of intelligence and political orientations before dealing with political orientations in gifted adults. Previous studies have generally found a positive correlation between intelligence and left-wing political orientations, while intelligence has shown a negative correlation with right-wing political orientations (e.g., Bell et al., 2020; Deary et al., 2008a). Less consistent results were reported concerning the relations between intelligence and multi-dimensional conceptions of political orientations (e.g., Mollerstrom & Seim, 2014; Sterling et al., 2016). Based on such correlations and missing studies concerning the political orientations of gifted individuals, we examined the political orientations of gifted adults comprehensively by considering both, a single-dimensional left-right scale as well as a more differentiated multi-dimensional questionnaire of political orientations.

1.1. Giftedness

Various conceptions of giftedness have been introduced (Preckel et al., 2024; Sternberg & Ambrose, 2021). Notably, intelligence is included as a core variable of giftedness in almost all conceptions. While intelligence is conceptualized theoretically and in corresponding intelligence testing as a continuous variable, a clear and straightforward definition and operationalization of giftedness such as IQ ≥ 135 (or IQ ≥ 130) has successfully been employed in research to identify gifted individuals, starting with Terman's seminal study (Terman, 1925; Terman & Oden, 1947, 1959). In the past decades, this intelligence-based giftedness approach has been continuously used in research and practice (e. g. Rost, 1993a; Rost, 2009a; Roznowski et al., 2000; Thompson & Oehlert, 2010), allowed clear group comparisons, and is built on a firm basis in educational and psychological research. Nevertheless, this boundary does not imply a discontinuity in intelligence. The intelligence-based approach of giftedness is supported by both conceptual and psychometric arguments (e.g., Rost, 2009b; Robinson, 2005; Roid, 2003; Warne, 2016; Wirthwein & Rost, 2011; Woods Jr. et al., 2019). Whereas studies that examine correlations between intelligence and other variables focus on the relations of both variables across the entire intelligence distribution, studies comparing gifted and non-gifted individuals (i.e., highly intelligent vs. average intelligent) emphasize the specific characteristics of the subgroup of gifted individuals. In such an extreme-group-design, however, it is not regarded whether the relations are linear or not. Historically, the subgroup of gifted individuals was occasionally assumed to be specifically maladjusted, surpassing expectations derived from the linear relationship between intelligence and other variables across the full range of intelligence (an assumption already investigated by Terman, 1925). According to the so-called Disharmony-Hypothesis (see e.g., Baudson, 2016), gifted individuals are assumed to be psychologically maladjusted as well as characterized by problems and troubles in diverse domains. In contrast, positive characteristics were documented repeatedly in empirical studies in accordance with the so-called Harmony-Hypothesis (see Rost, 2009a; Lubinski, 2016; Preckel et al., 2024; Terman & Oden, 1947). In accordance with the outlined tradition, we relied on an intelligence-based definition of giftedness and inspected distinct groups in our study.

1.2. Political orientations

Political orientations are typically understood as a system of beliefs and values of an individual concerning society's goals and the methods to achieve them (Tedin, 1987). Notably, different conceptions of political orientations align along a single dimension or along multiple ideological dimensions (Jost et al., 2009). According to the single-dimensional perspective, most political debates in Western societies can be understood through a singular left-right dimension, sometimes referred to synonymously as liberalism-conservatism spectrum (Jost, 2006). For instance, the ongoing US-American debate on healthcare is often framed in terms of a left-right dimension, where more left-wing or liberal individuals advocate for universal healthcare supported by government intervention, while more right-wing or conservative individuals emphasize market-driven approaches and individual responsibility. Challenging the single-dimensional left-right dimension, it was claimed to distinguish between at least two ideological dimensions in multi-dimensional perspectives (e.g., Carmines & D'Amico, 2015; Duckitt, 2001; Eysenck, 2017; Jost et al., 2003; Lipset, 1981). Whereas the sociocultural dimension reflects tensions between personal freedoms and societal tradition, ranging from social liberalism to social conservatism, the economic dimension is characterized by tensions between the equality of outcome and market autonomy spanning from economic liberalism to economic conservatism. In contrast to the single-dimensional perspective, one's political orientations can be described more precisely using multi-dimensional perspectives (Everett, 2013; Jedinger & Burger, 2019, 2020). For example, the Political Ideologies

Questionnaire (POLID; Ulrich, 2021; see below) used in this study consists of four scales: economic libertarianism, conservatism, socialism, and liberalism. Economic libertarianism emphasizes individual and market freedom, viewing merit-based inequalities as justified (see also e. g., Duckitt, 2001). Conservatism is rooted in societal cohesion through shared culture and tradition, advocating for stability and security (see also e.g., Jost et al., 2003). Socialism focuses on reducing inequalities by addressing exploitation of disadvantaged groups, promoting equality of outcome (see also e.g., Lipset, 1981). Liberalism is characterized by valuing individual autonomy and freedom (see also e.g., Jost et al., 2009). Importantly, the multi-dimensional political orientations of different conceptions, as exemplified in POLID (Ulrich, 2021), do not necessarily align closely (neither conceptually nor empirically) with the singular left-right dimension. Sociocultural and economical conservative orientations are typically associated with the right pole, while sociocultural and economical liberal orientations align with the left pole (Jedinger & Burger, 2022). In conclusion, the single-dimensional conception and the multi-dimensional conceptions differ substantially concerning the theoretical approach for political orientations. Depending on the survey setting or research question, researchers can use the one or the other conception, or a combination of both.

1.3. Intelligence/giftedness and political orientations

Examining the relations between intelligence and the single-dimensional left-right spectrum, higher intelligence correlated with less right-wing orientations (e.g., Kanazawa, 2010; Stankov, 2009) and, correspondingly, more left-wing orientations. For example, intelligence assessed at age 10 was positively associated with more liberal and anti-traditional attitudes at age 30 with comparable effect sizes for men/women (Deary et al., 2008a: β = 0.46/0.45; see also Woodley of Menie & Dunkel, 2015). Furthermore, in two national representative datasets from the United Kingdom, lower intelligence in childhood predicted right-wing political orientations in adulthood in males and females (−0.40 ≤ β ≤ −0.15; Hodson & Busseri, 2012). Similarly, in a German sample, intelligence showed a modest negative correlation with more right-wing or conservative orientations (Bell et al., 2020: ρ = −.10). Such rather consistent negative associations between intelligence and right-wing political orientations were also reported in a meta-analysis (Onraet et al., 2015: r = −.20). In one commonly posited explanation for the negative relationship between intelligence and conservatism (or in other words, the positive relationship between intelligence and liberalism), it has been suggested that lower intelligence may go hand in hand with feelings of discomfort or anxiety in situations of uncertainty or threat, which may promote conservative viewpoints (Wilson, 1973). Furthermore, the finding that individuals with higher intelligence tend to favor liberal orientations is assumed to be due to greater cognitive flexibility and openness to complex ideas of these more intelligent individuals as described in the Cognitive Complexity-Openness Hypothesis (Van Hiel et al., 2010). Research investigating gifted adults is needed to further elucidate these ideas and relations.

Concerning multi-dimensional conceptions of political orientations, positive relations of intelligence with social liberalism and, to a lesser extent, with economic conservatism were repeatedly found (e.g., Carl, 2014, 2015). For example, intelligence correlated with social liberalism in the 2012 American National Election Study (r = .22; Carl, 2015). Regarding economic conservatism, intelligence assessed at ages 10–11 years was associated with increased economic conservatism in adulthood in two cohorts from the British Cohort Study (Lewis & Bates, 2018: β = 0.20/0.26). These associations persisted even after controlling for potential confounding factors such as sex and parental social class. In further studies, either small positive correlations (e.g., Carl, 2014: r = .21; Carl, 2015: r = .12, Mollerstrom & Seim, 2014: r = .25; Oskarsson et al., 2015: r = .21), negligible correlations (e.g., Kirkegaard et al., 2017: r = .07; Rasmussen, 2016: r = .00), or even small negative correlations (e.g., Sterling et al., 2016: r = −.13) between intelligence and

economic conservatism were observed. A mean relation between intelligence and economic conservatism of $r = .07$ was reported in a meta-analysis (Jedinger & Burger, 2022). To conclude, further research clarifying the relations between intelligence as well as giftedness and multidimensional political orientations is needed.

Concerning the political orientations of individuals with higher intelligence test scores in terms of more or less extreme positions, research suggested that those individuals often gravitated towards centrist views, avoiding extremes (Deary et al., 2008b; Rindermann et al., 2012). Theoretically, more intelligent individuals may perceive extreme orientations as too strong simplification of a more complex real world (Bell et al., 2020). Additionally, the pattern of results was explained by the assumption that more intelligent individuals might easily realize that extreme political orientations are more socially unacceptable and refrain from expressing such views to avoid being socially censored (Woodley, 2010). Furthermore, it was theorized that individuals at the high intelligence extreme were genuinely interested in politics and had developed their political perspectives independently from others through comprehensive information gathering and reasoning (Kemmelmeier, 2008). In contrast, this author argued that individuals with more centered political orientations were often perceived as less interested in political affairs and more inclined to adopt moderate positions in alignment with societal norms. Additionally, Kemmelmeier (2008) assumed that expressing and justifying political views diverging significantly from mainstream opinions also requires higher intelligence scores. In a recently introduced framework regarding the relationship between intelligence and political orientations, Lin and Bates (2022) showed results linking intelligence not with left- or right-wing economic orientations, but with more extreme economic views, specifically, the degree to which individuals diverged from mainstream centrist perspectives. Correspondingly, these authors conducted two studies in the United Kingdom ($N_{1/2} = 700/700$) as well as a third analysis based on the British Cohort Study dataset ($N = 11,563$) and showed the anticipated relation between intelligence and economic nonconformity ($0.12 \leq \beta \leq 0.40$). While focusing on economic orientations in their empirical studies, Lin and Bates (2022) suggested to investigate more extreme standings in other (e.g., political) orientations. Gifted individuals are characterized by extremely high intelligence test scores that are far above the population mean. Finally, and as outlined before, higher intelligence (and giftedness) is assumed to be associated with openness to complex and nuanced political orientations according to the Cognitive Complexity-Openness Hypothesis (Van Hiel et al., 2010). Therefore, examining the political orientations in gifted adults might help to clarify the interplay of giftedness and political orientations.

Sex differences were investigated repeatedly in gifted populations. For example, significant differences between gifted males and gifted females were reported in multiple cognitive and psychosocial characteristics (e.g., Lubinski et al., 2023). Interestingly, both, gifted males and gifted females showed successful careers, whereas differences between those careers of male and female gifted adults were aligned with corresponding lifestyle preferences and priorities (Lubinski et al., 2014). Additionally, gifted male adolescents tended to ascribe greater interest in politics than gifted female adolescents (Lubinski et al., 1996). In another study with eight graders, however, gifted and non-gifted adolescents did not differ significantly in their interest in politics, and males were slightly more interested in politics than females (non-significant interaction giftedness × sex; Sparfeldt, 2006). Therefore, one should investigate sex differences in political orientations of gifted adults. Furthermore, sex differences may also interact with giftedness. Correspondingly, gifted males and gifted females may differ more or less than non-gifted males and non-gifted females in their political orientations. For example, gifted males showed higher analytical preferences than gifted females (Lubinski et al., 2023), which might correspond with differences in, for example, economic political orientations. Furthermore, such a sex effect might differ in gifted and non-gifted adults. Investigating these differences is crucial for understanding the interplay

between giftedness, sex and political orientations.

1.4. The present study

Given the great importance of political orientations and based on the aforementioned results and research-gaps, we investigated the political orientations of gifted and non-gifted adults in this study in a more comprehensive manner. Specifically, we investigated adults that had been identified as gifted in childhood and subsequently in adolescence in accordance with prior giftedness studies that inspected later-life outcomes of gifted samples identified early in life (e.g., Lubinski et al., 2023; Terman & Oden, 1947, 1959) as well as studies investigating the relationship between childhood intelligence and political orientations in adulthood (e.g., Deary et al., 2008a, 2008b; Lewis & Bates, 2018). Furthermore, we analyzed the political orientations in the sense of the single-dimensional conception as well as in a multi-dimensional framework. Due to heterogeneous results in previous studies, we formulated research questions instead of specific hypotheses.

Concerning the first of the research questions, we asked whether gifted and non-gifted adults differed in their answers on a left-right-scale to measure single-dimensional political orientation. Regarding the second research question, we asked whether gifted and non-gifted adults varied in their multi-dimensional political orientations. Specifically, we relied on a questionnaire covering four political orientations: Economic Libertarianism, Conservatism, Socialism, and Liberalism. Based on the aforementioned differences between gifted males and females in important other variables (e.g., Rost, 2009a; Lubinski et al., 2023), we controlled for possible sex effects and examined potential interaction effects giftedness × sex.

2. Method

2.1. Sample and procedure

The data for this study was collected as part of the Marburg Giftedness Project (Rost, 1993a; Rost, 2009a), a longitudinal study focusing on gifted individuals. In the academic year 1987/1988 three established standardized intelligence tests were administered to a nationwide sample of $N = 7023$ third-graders out of 390 classes from West Germany: (a) the German adaptation of Cattell's 'Culture Fair Test of Intelligence' (CFT 20, Weiß, 1987; subtests series and matrices; 24 items, $r_{tt} = .85$), measuring fluid ability, (b) verbal analogies (Verbale Analogien; Portmann, 1974, 1975; 66 items, $r_{tt} = .91$), measuring verbal reasoning, and (c) a number based trail-making test (ZVT, Zahlen-Verbindungs-Test, Oswald & Roth, 1987; 4 matrices, $r_{tt} = .88$), measuring speed of information processing. Combining these three intelligence tests weighted according to their g-saturation (loadings on the first non-rotated principal component: $a = .71$ to $a = .83$) yielded the score for general intelligence. In accordance with substantial parts of giftedness research (e.g., Lubinski et al., 1996; Terman, 1925, see also Preckel et al., 2024; Rost, 2009a; Sparfeldt & Ruby, 2025), the continuous intelligence distribution served as basis for group formation. The initial target group consisted of those $n = 151$ third graders with an IQ above 129 (43 % female, mean IQ = 135, $SD = 5.9$, mean age = 9.2 years, $SD = 0.4$ years). The initial comparison group consisted of $n = 136$ third graders with average intelligence scores (43 % females, mean IQ = 102, $SD = 6.3$, mean age = 9.2 years, $SD = 0.4$ years). The students of the initial comparison group were matched as closely as possible to the students of the initial target group on potentially interfering variables (e.g., socio-economic status, school environment, sex proportions) to ensure that both groups differed regarding their giftedness-status, but were similar to each other regarding these potentially interfering variables (see Rost, 1993b).

Six years later, in 1994, three conceptually analogous intelligence tests were administered to the students of both groups, at that time ninth graders with an average age of 15.3 years (response rates: 100 % for the

initial target group; 97 % for the initial comparison group; Rost, 2009b): (a) a combination of number series (Amthauer, 1970; 20 items, $r_{tt} = .92$) and graphical symbols (Horn, 1983; 40 items, $r_{tt} = .82$), measuring non-verbal reasoning, (b) verbal analogies (Amthauer, 1970; 20 items, $r_{tt} = .63$), measuring verbal reasoning, and (c) ZVT (Oswald & Roth, 1987; $r_{tt} = .86$). To control for the effects of an 'IQ-gain' over time (see, e.g., Flynn, 1999; Pietschnig & Voracek, 2015), we relied on data from an independent sample of $n = 919$ grade 9 students, who worked on these intelligence tests at the same time to establish current norms. Again, we combined these intelligence tests to form an intelligence score weighted according to their g-saturation (loadings on the first non-rotated principal component: $a = .69$ to $a = .86$; Hanses, 2009).

The students of the initial target group, who achieved as ninth graders an IQ score of at least 125, were classified as gifted (G; $n = 107$, 42 % female, mean IQ = 136. $SD = 8.4$, mean age = 15.3 years, $SD = 0.3$ years; resembling 71 % of the initial target group). This corresponds to a test-retest reliability of $r_{tt} = .85$ (Hanses, 2009). Out of the students of the initial comparison group, we selected an equal sized group of non-gifted students (NG; $n = 107$, 44 % female, mean IQ = 102, $SD = 9.6$, mean age = 15.3 years, $SD = 0.5$ years), while again considering socioeconomic status, school environment, and sex-proportions. Participants were neither made aware of their intelligence test scores nor their ability status by the project team.

The questionnaire assessing political orientations was mailed to the participants in December 2022 and answered by $n = 158$ participants (46 % female) collected until July 2023. The overall response rate was 74 % (gifted: $n = 87$, 43 % female, mean IQ = 136; $SD = 8.6$; non-gifted: $n = 71$, 50 % female, mean IQ = 104; $SD = 8.9$). The participants' mean age was 43.6 years ($SD = 0.5$ years).

2.2. Instruments

We assessed the uni-dimensional political orientation with a left-right self-placement scale, commonly employed in political and social surveys such as the German General Social Survey (ALLBUS; Breyer, 2015). Individuals were expected to rate their political orientation on a 10-point scale, ranging from left (1) to right (10).

Multi-dimensional political orientations were measured with the Political Ideologies Questionnaire (POLID; Ulrich, 2021), a multi-dimensional German instrument designed to assess self-reported political orientations. The POLID captures fundamental political orientations within the Western political spectrum, namely economic libertarianism, conservatism, socialism, and liberalism, with four items each. Participants answered on a 5-point scale, ranging from 1 (= strongly disagree) to 5 (= strongly agree).

Individuals who score high on economic libertarianism value individual and market freedom. They regard merit-based inequalities as congruent with the meritocratic principle, and tend to reject welfare state benefits as incongruent with this principle (e.g., "Fairness means that I do not have to pay for people who do not achieve as much as I do"; Cronbach's $\alpha = .61$, as reported by Ulrich, 2021).

Individuals with high conservatism scores believe that societal cohesion relies primarily on a shared culture, cautioning against the disappearance of a shared culture to prevent societal fragmentation. High-scoring individuals are skeptical about rapid social change and emphasize individuals' security, positing that freedom is viable only within a framework of precise societal rules (e.g., "The state should focus primarily on preserving our common culture and traditions"; $\alpha = .70$, Ulrich, 2021).

Individuals who score high on socialism divide society into the advantaged and the disadvantaged. The disadvantaged are often subject to exploitation pertaining to both economic and socio-cultural realms. These individuals are committed to equality of outcome, emphasize inclusion, and advocate radical social change to eradicate exploitation (e.g., "Most income differences are unfair because everyone is equal"; $\alpha = .62$, Ulrich, 2021).

Individuals who achieve high scores in liberalism place a strong value on individual freedom and autonomy. Liberals reject rigid social rules and argue that the only permissible constraint on individual freedom is the consideration of the well-being and freedom of others (e. g., "The most important thing for me is that I can live my life the way I want to – as long as I don't harm anyone else"; $\alpha = .68$, Ulrich, 2021).

2.3. Statistical analysis

Concerning the first research question, we ran a 2×2 between-subjects ANOVA with the independent variables giftedness (gifted vs. non-gifted) and the control variable sex (male vs. female) and the left-right self-placement scale as dependent variable. Additionally, we calculated the effect size partial η^2 and Cohen's d (using the pooled standard deviation; Cohen, 1988). As the main effect of sex was not part of our research question, we analyzed univariate sex differences only complementarily while inspecting the corresponding giftedness $\times$ sex interaction effect.

Addressing the second research question, we started with preliminary analyses of the questionnaire assessing multi-dimensional political orientations (principal component analysis with oblique PROMAX rotation, reliability analysis). Then, we conducted a 2×2 between-subjects MANOVA, using the four POLID-scales as dependent variables and giftedness and sex (the control variable) as independent variables. In the case of statistically significant multivariate results ($p < .05$), we subsequently performed univariate analyses. Due to the problem of inflating the type 1 error by multiple significance tests, we applied Holm's (1979) strategy of sequential α-adjustment. We calculated the effect sizes partial η^2 and d. All analyses were performed using the statistical software R (R Core Team, 2024).

Calculated with G*Power (Version 3.1.9.7; see Faul et al., 2009), the power to detect effect sizes of $d = 0.3/d = 0.5$ for giftedness effects in an ANOVA with $n = 154$, two groups, and α = .05 was approximately .37/ .79. For the MANOVA ($n = 158$, equal sized groups, α = .05, four dependent variables), power to detect effect sizes of $\eta^2_{multi} = .06/\eta^2_{multi} = .08$ effects was approximately .62/.78 for main and interaction effects.

To supplement the mentioned statistical analyses in order to strengthen our interpretations with the evidence brought by the data especially in case of small or zero effects, we conducted a-posteriori Bayesian model comparisons using the BayesFactor package (Morey & Rouder, 2024). For each outcome, we compared (a) a model including the giftedness term and the sex term against (b) a model without the giftedness term but including the sex term to test the giftedness effect and (a) a model including the giftedness term, the sex term, and the giftedness $\times$ sex interaction term against (b) a model without the interaction term to test the interaction effect. This approach quantifies the relative evidence for models with and without giftedness (and interaction) effects.

3. Results

Scale means and standard deviations are reported in Table 1. Regarding the first research question, addressing the left-right self-placement scale, the ANOVA did reveal neither statistically significant main effects of giftedness ($F[1, 150] = 2.94$, $p = .098$; $\eta^2 = .02$) or sex (F [1, 150] = 0.48; $p = .492$; $\eta^2 < .01$) nor a statistically significant interaction effect ($F[1, 150] < .01$; $p = .964$; $\eta^2 < .01$).

Regarding the preliminary analyses related to the dimensional structure of the multi-dimensional POLID, the principal component analysis of the POLID items suggested the extraction of four components (eigenvalues: 3.69, 2.91, 2.34, 1.11, 0.85, 0.73 …). The results of the oblique PROMAX rotation (κ = 4) corresponded with those reported by Ulrich (2021). Specifically, the item loadings on their respective component were high (mean loading: $a = .78$; range: $.49 \leq a \leq .96$) and the side loadings were lower ($a \leq .40$). Concerning corresponding scales, Cronbach's α (supplemented by McDonald's ω) indicated sufficient

Table 1

Descriptive statistics of the scales (upper part), ANOVA results and effect sizes (d, η^2; middle part), and results of the Bayesian analyses including Bayes factors (BF; lower part).

		EL	C	S	L	L-R
	n	M/SD	M/SD	M/SD	M/SD	M/SD
Gifted Male	49–50	2.65/ 0.83	2.45/ 0.69	3.14/ 0.75	3.88/ 0.71	4.47/ 1.70
Gifted Female	37	2.62/ 0.85	2.67/ 0.68	3.42/ 0.78	3.76/ 0.77	4.30/ 1.53
Non-gifted Male	33–36	2.63/ 0.92	2.93/ 0.79	3.42/ 0.84	3.75/ 0.73	4.94/ 1.82
Non-gifted Female	35	2.64/ 0.89	2.48/ 0.63	3.42/ 0.78	3.96/ 0.78	4.74/ 1.48
Gifted	86–87	2.64/ 0.83	2.55/ 0.69	3.26/ 0.77	3.83/ 0.73	4.40/ 1.62
Non-gifted	68–71	2.64/ 0.90	2.71/ 0.75	3.42/ 0.81	3.85/ 0.75	4.84/ 1.64
Male	82–86	2.64/ 0.86	2.65/ 0.77	3.26/ 0.80	3.83/ 0.72	4.66/ 1.75
Female	72	2.63/ 0.87	2.58/ 0.66	3.42/ 0.77	3.86/ 0.77	4.51/ 1.51
ANOVA results						
Giftedness	p	.998	.198	.264	.791	.089
	d	0.00	−0.22	−0.20	−0.03	−0.27
Sex	p	.952	.321	.280	.705	.491
	d	0.01	0.10	−0.20	−0.04	0.09
Giftedness × Sex	p	.890	.003	.273	.178	.964
	η^2	<.01	.05	<.01	.01	<.01
Bayesian results						
Giftedness	BF_{10}	0.17	0.48	0.34	0.17	0.67
	BF_{01}	6.00	2.09	2.96	5.90	1.49
Giftedness × Sex	BF_{10}	0.26	11.54	0.41	0.55	0.24
	BF_{01}	3.87	0.09	2.46	1.81	4.15

Notes. EL = Economic Libertarianism; C = Conservatism; S = Socialism; L = Liberalism; L-R = Left-Right-Scale. BF_{10} = evidence for the model including giftedness (or the interaction) with $BF_{10} > 1$ indicating support for the model including giftedness (or the interaction). BF_{01} = evidence for the model without giftedness (or the interaction) with $BF_{01} > 1$ indicating support for the model without giftedness (or the interaction).

reliability estimates: economic libertarianism – α = .79 (ω = .82), conservatism – α = .79 (ω = .83), socialism – α = .74 (ω = .78), liberalism – α = .83 (ω = .85). The correlations of the POLID scales among each other and with the left-right self-placement scale are depicted in Table 2.

Concerning the second research question, the MANOVA with the four POLID scales as dependent variables did not reveal statistically significant main effects of giftedness (F [4, 151] = 0.96, p = .430; η^2_{multi} = .02) and sex (F[4, 151] = 0.65; p = .626; η^2_{multi} = .02), but a statistically significant interaction effect (F[4, 151] = 33.02, p = .013; η^2_{multi} = .08). Regarding univariate ANOVAs, the interaction effect was statistically significant for conservatism (F[1, 154] = 8.92; p = .003; η^2 = .05; see Table 1), but not for the remaining three scales. Supplementary univariate analyses revealed no statistically significant main effects. Non-gifted males showed higher conservatism scores than gifted males

Table 2

Pearson correlations between political orientations.

	1	2	3	4
1. Economic Libertarianism				
2. Conservatism	.38			
3. Socialism	−.41	.01		
4. Liberalism	.09	−.01	.18	
5. Left-Right-Scale	.63	.41	−.45	.03

Notes. N = 154–158. Correlation coefficients above $|r|$ = .18 differ statistically significantly from zero (p < .05).

(α' (Holm) = .008, p < .001, d = 0.66), an effect of medium size (adhering to Cohen, 1988). Descriptively, non-gifted males scored higher on conservatism than non-gifted females (α'' (Holm) = .010, p = .010, d = 0.62).

The a-posteriori Bayesian model comparisons for the left–right self-placement scale showed for the main effect giftedness, that the model including the giftedness term was not preferred over the model containing only the sex term (BF_{10} = 0.67). Correspondingly, support was indicated for the model without giftedness (BF_{01} = 1.49). Regarding the interaction, the model including the interaction effect was not supported (BF_{10} = 0.24; BF_{01} = 4.15). To conclude, these results indicated no evidence for differences between gifted and non-gifted adults on the left–right self-placement scale. Regarding the POLID-scales economic libertarianism, socialism, and liberalism, neither the models with the main effect including giftedness (BF_{10} = 0.17–0.34), nor the models with the interaction effect (BF_{10} = 0.26–0.55) were supported. Concerning conservatism, the main-effect model was not supported (BF_{10} = 0.48), but the model with the interaction term received support (BF_{10} = 11.54). The results of these Bayesian analyses are summarized in Table 1. Notably, the interpretations of the results of these Bayesian analyses were in accordance with the aforementioned ANOVA results.

4. Discussion

In this study, we explored the political orientations of gifted adults, offering new insights into how giftedness is related to political orientations. The results are based on gifted and non-gifted adults, who were identified from a non-preselected sample in elementary school and re-identified in adolescence. Several novel findings are remarkable: Neither a significant difference between gifted and non-gifted adults nor a significant interaction effect with sex were observed in the single-dimensional political orientation. Furthermore, neither gifted nor non-gifted adults showed significant differences in their multi-dimensional political orientations. Nevertheless, a notable interaction effect emerged for conservatism, indicating that non-gifted men showed higher conservatism scores than gifted men. These interpretations were corroborated by the Bayesian analyses.

4.1. Giftedness and political orientations

Concerning the single-dimensional political orientation reflected by a left-right self-placement scale, gifted adults did not differ significantly from their non-gifted counterparts in the ANOVA. Accordingly, Bayesian analyses provided no support for differences between gifted and non-gifted adults. Notably, mostly small positive correlation coefficients between intelligence and left-leaning orientations or, in other words, small negative correlations with right-leaning orientations were reported in previous studies (e.g., Deary et al., 2008a; Onraet et al., 2015; Van Hiel et al., 2010). Interestingly, the effect size of the nonsignificant descriptive difference between gifted and non-gifted adults in our study (d = −0.27 corresponding to r = .13) is well in line with correlations between intelligence and single-dimensional political orientations reported in the introduction (e.g., Bell et al., 2020). In future studies with larger samples, such a small giftedness effect might reach statistical significance. According to the Cognitive Complexity-Openness Hypothesis (Van Hiel et al., 2010), highly intelligent and gifted individuals are characterized by high cognitive flexibility and openness to complex ideas. Accordingly, high intelligence and giftedness might go hand in hand with more nuanced, centrist political orientations. Correspondingly, differences between gifted and non-gifted individuals are expected to diminish, resulting in comparable political orientations within a context of balanced societal norms. The lack of significant differences between gifted and non-gifted adults concerning their mean scores as well as the results of our Bayesian analysis without evidence favoring the model with giftedness did not contradict a comparable localization of both groups on the left-right scale. Additionally, we descriptively

compared the results of our sample with those reported in the German General Social Survey 2014 dataset (ALLBUS; see Breyer, 2015), a large and representative study (e.g., $n = 3236$). These comparisons revealed very similar standard deviations (gifted/non-gifted/ALLBUS: $SD = 1.62/1.64/1.61$). Furthermore, the mean values of our groups were located close to the center of the scale (ranging from 1 to 10) as well as close to the mean of the ALLBUS sample ($M = 4.40/4.84/5.04$). These similarities suggest that both our gifted and non-gifted adults have relatively centered mean political orientations. This pattern may reflect societal influences characteristic of the times in Germany, where, for example, a balanced social market economy may homogenize political views across intelligence levels, consistent with a weaker form of the Cultural Mediation Hypothesis (Woodley, 2010; Woodley of Menie & Dunkel, 2015). Importantly, our result pattern seems not to result from severe measurement limitations (e.g., insufficient reliability), but rather comparable left-right placements of gifted and non-gifted adults. However, the single-dimensional assessment of political orientations may not have revealed a more fine-grained, comprehensive picture. Therefore, we assessed multi-dimensional political orientations as well.

Regarding the multi-dimensional conception of political orientations, no significant differences were observed between gifted and non-gifted adults concerning their economic libertarianism, socialism, and liberalism in the ANOVAs. Correspondingly, the results of the Bayesian analyses did not provide evidence for giftedness effects. Concerning conservatism, no significant main effect of giftedness but a significant interaction effect was shown (also in accordance with the Bayesian results), indicating more conservative orientations of non-gifted compared to gifted males. Notably, the design, sample size, and statistical power of our study should be considered. According to the previously mentioned Cognitive Complexity-Openness Hypothesis (Van Hiel et al., 2010), gifted individuals may not diverge markedly from non-gifted peers. The aforementioned Cultural Mediation Hypothesis complements this by suggesting that societal norms, in a culturally homogeneous context such as Germany's social market economy, may align economic and sociocultural orientations across groups, reducing possible differences (Woodley, 2010; Woodley of Menie & Dunkel, 2015). Notably, our results do not align with findings that intelligence is generally positively associated with sociocultural liberalism and negatively associated with sociocultural conservatism (e.g., Carl, 2014, 2015).

Besides mostly non-significant interaction effects, we observed only for conservatism a significant interaction effect (mirrored in the Bayesian analyses). Specifically, non-gifted men exhibited higher levels of conservatism than their gifted counterparts with a medium effect size ($d = 0.66$), while no significant difference was observed for women ($d = 0.29$). Notably, non-gifted men displayed the numerically highest conservatism scores ($M = 2.93$) across all four groups of gifted and non-gifted males and females. Non-gifted males may rely stronger on heuristic-driven and traditional perspectives, resulting in less engagement with complex sociopolitical issues (Heaven et al., 2011; Stankov, 2009) and higher conservatism scores. In contrast and in accordance with the Cognitive Complexity-Openness Hypothesis (Van Hiel et al., 2010), gifted males with greater cognitive flexibility may process diverse perspectives and reject rigid traditional norms, leading to lower conservatism scores. As gifted males reported higher political interest than gifted females in a former study (Lubinski et al., 1996), the potential moderator sex needs to be considered. The non-significant difference in females could reflect lower salience of conservatism among women or different socialization patterns between males and females, warranting further exploration in future studies. In conclusion, our findings underscore the need to consider sex-moderated patterns of sociocultural political orientations and the role of conservatism among non-gifted men.

4.2. Strengths, limitations, and further directions

Our study contributes to the increasing understanding of the relationship between giftedness and political orientations. Notably and in contrast to many former studies inspecting giftedness, the investigated sample of gifted adults was recruited from a large and non-preselected sample in elementary school. Furthermore, the gifted individuals of the target group were matched to non-gifted individuals of the control group on key variables (e.g., sex ratio, school class and school, socioeconomic status), thereby minimizing the potential impact of confounding variables and ensuring that observed group differences are more likely attributable to giftedness. Although group formation was based on data collected during childhood and adolescence (i.e., grade three and nine), the present analyses focus on outcomes in adulthood—specifically, political orientations. Thus, the current findings do not reflect longitudinal changes per se, but rather differences in political orientations in adulthood as a function of giftedness (assessed earlier in life). Importantly, very high long-term stability coefficients of general intelligence across decades (e.g., Rost, 2010; Breit et al., 2024; Deary et al., 2000; Schalke et al., 2013) underline the validity of giftedness classifications in elementary school and adolescence for adulthood. By inspecting adults rather than children or adolescents, our results elucidated our understanding of the political orientations of gifted individuals at a mature stage where, for example, participating in elections is possible. Additionally, the response rate in our sample was remarkably high (74 %), given the study's duration of more than 35 years. For the assessment, we measured political orientations using both single-dimensional and multi-dimensional instruments, ensuring a broader representation as well as greater precision of political orientations. Furthermore, the psychometrical characteristics of the instrument to assess multi-dimensional political orientations were even more promising (for factor structure, and reliability for example) than those described in the original publication (Ulrich, 2021).

Despite these strengths, some limitations should be acknowledged. First, the sample and the sample size were inherently fixed, given the longitudinal nature of the study with group formation in childhood and adolescence. Complimentary to our extreme-group design, studies investigating intelligence differences on a broader spectrum might detect linear or non-linear intelligence-relations. Notably, we assessed political orientations in adulthood which involved a substantial temporal distance from the earlier assessments of intelligence. Nevertheless, our findings demonstrated meaningful differences and similarities between gifted and non-gifted adults. Based on the aforementioned and remarkably high stability of intelligence and giftedness, we consider these group differences as valid estimates of political orientations in gifted adults. Besides, a cross-sectional assessment of giftedness and political orientations in adulthood, more fine-grained inspections of subgroups of gifted individuals, or analyses across a broader intelligence range should be done in future studies to supplement our results. Second, and somehow related to the first aspect, the longitudinal nature of our study constrained the sample size. Despite the remarkable high response rate mentioned before, the issue of statistical power needs to be mentioned. Although power can be considered sufficient to detect large and medium effects, the issue of power might explain some of our null findings. Nevertheless, the interpretation of the Bayesian analyses supported the ANOVA results. Correspondingly, the sample size should be increased in future studies to detect small effects more reliably. Nonetheless, the reported effect sizes might serve as estimates of the expected effect sizes in future studies. Importantly, we reported all effect sizes (Table 1) irrespective of statistical significance in order to draw a comprehensive picture regarding political orientations of gifted adults. Third, we focused exclusively on German adults. Given that political orientations and their associations with intelligence vary across cultural contexts (Rindermann et al., 2012), future research should investigate these relations in politically more diverse settings to clarify the generalizability of our results. Furthermore, replicating our results and in particular the interaction effect for conservatism would be important to further validate the proposed role of giftedness and sex differences in shaping political orientations.

To expand our findings, future research should examine party preferences and the voting behavior of gifted adults to gain a deeper understanding of their political engagement that can be interpreted as a manifestation of political orientations. As shown in previous studies, individuals with higher intelligence are more likely to favor certain political parties (e.g., Bell et al., 2020; Deary et al., 2008b) and exhibit higher voter turnout rates (e.g., Deary et al., 2008b). Investigating these aspects further could provide valuable insights concerning the relations between giftedness and broader patterns of political participation.

In conclusion, we inspected the political orientations of gifted adults and found no support for differences between gifted and non-gifted adults in either single-dimensional or multidimensional orientations. Interestingly, one exception to this more general result pattern appeared, with effects that were mostly not sex-moderated. Specifically, non-gifted males exhibited significantly higher levels of conservatism compared to their gifted counterparts (mirrored by Bayesian results). In total, these findings supplemented our understanding of the political orientations of gifted adults as an important element in clarifying the political engagement of this relevant group.

CRediT authorship contribution statement

Maximilian Krolo: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Jörn R. Sparfeldt:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Detlef H. Rost:** Writing – review & editing, Project administration, Funding acquisition, Conceptualization.

Declaration of competing interest

None.

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Data availability

The data that has been used is confidential.

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