

Designing the Ideal Political Identity Questionnaire Using Machine Learning and Ideology Scales

Ana Nikolić¹, Uroš Sergaš¹ and dr. Marko Tkalčič¹

¹University of Primorska, FAMNIT, Glagoljaška 8, SI-6000 Koper, Slovenia

Abstract

Political ideology shapes beliefs, behavior and attitudes toward society. Many existing questionnaires for measuring ideology are lengthy, repetitive, and misaligned with self-perception. This paper investigates whether a shorter, reliable, two-dimensional political identity questionnaire can be created using machine learning and psychometric methods. Sixty participants completed four ideological instruments (MFQ, SDO, RWA and 8values). Lasso regression and Random Forest with nested cross-validation identified predictive items, while psychometric evaluation included CFA and Cronbach's alpha. Random Forest outperformed Lasso. Internal reliability was excellent and factor loadings supported a two-factor structure despite moderate model fit. Findings show that ideology can be measured efficiently with reduced items, supporting applications in research, digital platforms and political psychology.

Keywords

political ideology, questionnaire design, machine learning, psychometrics

1. Introduction

Political ideology shapes how individuals think, act and relate to society. It plays a key role in explaining attitudes toward morality, authority and state control. To measure ideology, psychology and political science rely on questionnaires such as the Moral Foundations Questionnaire (MFQ)[2], the Social Dominance Orientation scale (SDO)[3] and the Right-Wing Authoritarianism scale (RWA)[1]. Each of these focuses on different aspects: morality, authority or social hierarchies. Many people are also familiar with popular online quizzes, such as the 8values test or Political Compass, which aim to place users on a political map in a simplified and engaging way. In practice, however, these instruments are often long, redundant and not always aligned with how people perceive their own political orientation.

Recent work in computational social science suggests that machine learning can be used to shorten and refine such questionnaires, while psychometric methods ensure their reliability and validity. This approach has been successfully applied to instruments like the SOAPP-R (The Screener and Opioid Assessment for Patients with Pain-Revised) [7], where machine learning-based pruning was followed by traditional psychometric validation, confirmatory factor analysis (CFA), internal consistency measures and item-total correlations. Yet few studies have attempted to combine multiple ideological instruments and reduce them into a concise tool that still captures the two widely accepted dimensions of ideology: the liberal-conservative axis and the libertarian-authoritarian axis.

This paper addresses this gap by testing whether four ideological instruments (MFQ, SDO, RWA and a subset of 8values) can be reduced into a shorter, valid and reliable two-dimensional political identity questionnaire. We integrate machine learning and psychometric analysis to explore more effective methods for measuring political ideology. The goal is to create a more concise and practical tool that can be used in surveys, academic research or online platforms. The result is not just a shorter questionnaire, but also a better understanding of which questions matter most and why.

The analysis is guided by the following research questions (RQ):

RQ1 To what extent do political identity questionnaires align with participants' self-identified political ideology?

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✉ 89211089@student.upr.si (A. Nikolić); uros.sergas@upr.si (U. Sergaš); marko.tkalcic@famnit.upr.si (dr. M. Tkalčič)



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- RQ2** How strongly are the liberal-conservative and libertarian-authoritarian dimensions captured by each questionnaire?
- RQ3** Do demographic factors influence participants' ideological scores or questionnaire preferences?
- RQ4** Can a concise, valid, and reliable two-dimensional political ideology questionnaire be constructed by combining the most predictive and non-redundant items from our questionnaires?
- RQ5** Which specific items are most predictive of self-identified ideology as determined through machine learning?

These questions are designed to move step by step from understanding how current questionnaires perform to exploring how they can be improved. The first two ask whether the instruments actually reflect how people see themselves and how strongly they capture the two main ideological dimensions. The third looks at whether factors like gender play a role in shaping results. Finally, the last two questions focus on building something new: a shorter, more practical questionnaire that still works well, and identifying which items really carry the most weight.

2. Methods

In this section, we describe the methodology employed in this paper, focusing on data collection, the use of machine learning techniques to refine existing political ideology questionnaires and the subsequent psychometric evaluation of the reduced item sets.

2.1. Participants and Instruments

To investigate how well different ideological questionnaires capture political self-identification, we designed a custom online survey. Sixty adult participants completed an online survey that began with a short demographic section and then included four ideological instruments: the 30-item Moral Foundations Questionnaire (MFQ), the 16-item Social Dominance Orientation scale (SDO), the 20-item Right-Wing Authoritarianism scale (RWA) and 37 items from the government axis of the 8values test, a widely used online questionnaire. Together, these produced 103 predictors. Participants also self-placed on two seven-point scales: one for liberal-conservative orientation and another for libertarian-authoritarian orientation. This allowed us to later compare participants' self-placement with their score-based ideological profiles. When choosing which questionnaires to include, the aim was to combine trusted scientific tools with at least one widely recognised online questionnaire.

2.2. Predictive Modelling

We modelled political self-identification as a continuous outcome and applied two algorithms: Lasso regression and Random Forest regression. Lasso was selected for its ability to perform feature selection by shrinking irrelevant coefficients to zero, while Random Forest was chosen for its capacity to capture non-linear relationships and provide robust variable importance rankings. Before modelling, all responses were converted to numeric values. Reverse-coded items were corrected and scales were aligned so that higher scores consistently represented stronger endorsement of the relevant ideological stance. Items were then standardised within each training fold since models were evaluated using nested cross-validation and replicated across twenty random seeds to ensure reliable and consistent results. To preserve interpretability, we avoided dimensionality-reduction techniques such as principal component analysis and refrained from aggressive imputation. This approach made the most of our limited data and helped avoid overly positive performance results by clearly separating model training from testing. Model performance was evaluated with explained variance (R^2), mean absolute error (MAE), mean squared error (MSE) and root mean squared error (RMSE). MFQ and SDO were used as predictors for the liberal-conservative axis, while RWA and 8values were used for the libertarian-authoritarian axis.

2.3. Psychometric Evaluation

The reduced item sets obtained from modelling were evaluated using Confirmatory Factor Analysis (CFA) and internal consistency testing. CFA assessed whether the items fit the expected two-factor ideological structure, while Cronbach's alpha measured the internal consistency of the reduced scales within each dimension. Items with negative loadings or strong cross-loadings were candidates for exclusion.

3. Results

This section presents the results, structured around the five research questions. Each subsection addresses one question, with the final subsection combining RQ4 and RQ5 due to their conceptual overlap. The results include statistical analyses, predictive modelling, psychometric validation and group comparisons, with key findings highlighted for each research question.

3.1. RQ1: Alignment with self-identified ideology

The first research question asked how well the four questionnaires aligned with participants' self-identified political orientation. To assess this alignment, Spearman's rank correlation coefficients were calculated between each questionnaire's total score and the corresponding self-placement scale. Before testing correlations, we examined the distribution of self-placement on the two axes. As shown in Figure 1, most participants identified as *Liberal* and *Libertarian* and it is important to mention that no participants selected the *Strongly Conservative* or *Strongly Authoritarian* options, indicating a lack of representation at the extreme ends of the ideological spectrum.

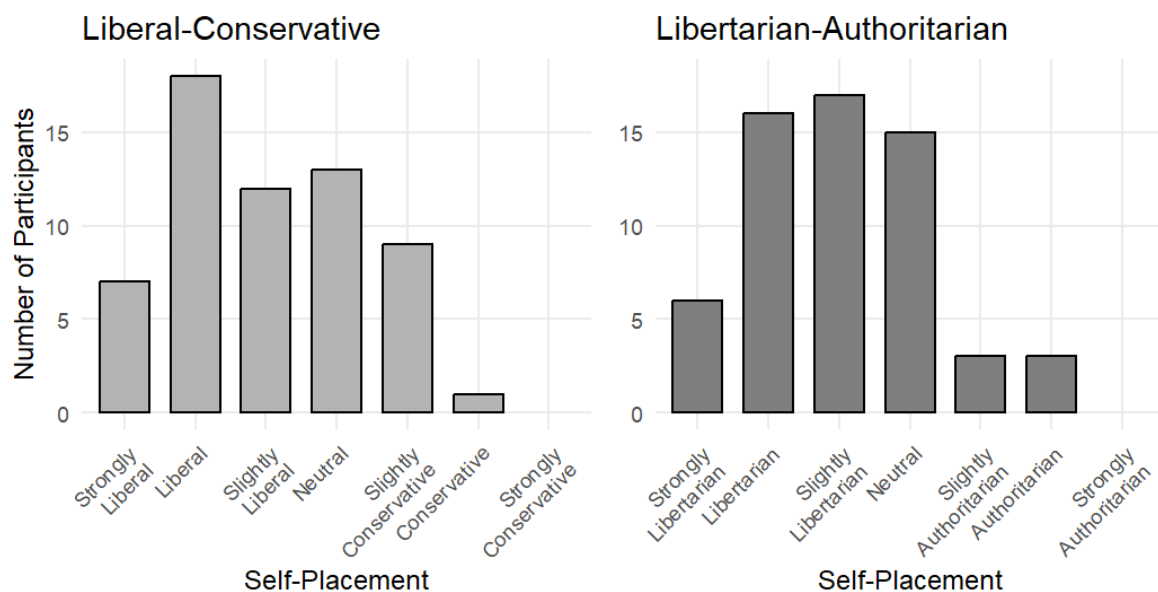


Figure 1: Distribution of self-identified ideological positions along the liberal-conservative and libertarian-authoritarian axes.

For the liberal-conservative axis, the MFQ ideology score (binding minus individualising foundations) showed a strong positive correlation with self-placement ($\rho = 0.73, p < .001$). SDO also correlated positively with liberal-conservative self-placement ($\rho = 0.56, p < .001$), indicating that individuals who preferred hierarchy and inequality were more likely to identify as conservative. MFQ and SDO were themselves correlated ($\rho = 0.70$), which suggests that although the two scales measure different concepts, they move together.

For the libertarian-authoritarian axis, RWA scores strongly correlated with authoritarian self-placement ($\rho = 0.68, p < .001$). The 8values government scale showed the expected negative correlation ($\rho = -0.72, p < .001$), with higher scores linked to lower authoritarian identification. RWA and 8values were strongly negatively correlated ($\rho = -0.87$), confirming that they represent opposite ends of the same underlying dimension of authority and state power.

3.2. RQ2: Capturing the ideological axes

The second research question examined how strongly each questionnaire predicted participants' self-identified position on the two dimensions. We trained Random Forest regression models separately for each instrument and for the theoretically grounded combinations (MFQ + SDO on the liberal-conservative axis, RWA + 8values on the libertarian-authoritarian axis). To get more reliable results, we ran each model using multiple random seeds and then averaged the results.

3.2.1. Liberal-Conservative axis

For each model, the dataset was repeatedly split into training (75%) and testing (25%) sets using a stratified split based on participants' self-identified liberal-conservative placement. Stratified splits preserved the original ideological distribution, reducing bias and improving generalizability. Stratification helped maintain diversity and avoid biased or unbalanced models. The MFQ-based model achieved an average R^2 value of 0.43, indicating that moral foundation scores explained approximately 43% of the variance in participants' self-identified political orientation, along the liberal-conservative axis. The SDO-only model performed slightly lower, with an average test R^2 of 0.32, suggesting that preferences for group-based hierarchy and inequality also contribute meaningfully, though somewhat less strongly, to ideological self-placement. When both instruments were combined, the predictive performance improved to an average R^2 value of 0.47, indicating that the two scales capture complementary aspects of the liberal-conservative spectrum. Additional model performance metrics are summarised in Table 1.

Table 1

Predictive performance of models for liberal-conservative axis

Model	Test R^2	MAE	MSE	RMSE
MFQ	0.43	0.74	0.83	0.90
SDO	0.32	0.81	0.98	0.98
MFQ + SDO	0.47	0.70	0.77	0.87

3.2.2. Libertarian-Authoritarian axis

The RWA-only model achieved an average R^2 value of 0.36, indicating that attitudes related to submission, norm adherence and perceived threat serve as moderate predictors of authoritarian self-placement. The 8values model, which measured participants' agreement with government control and state power, resulted in an average R^2 of 0.42. When the two instruments were combined, predictive performance improved further to an average R^2 value of 0.43. This small improvement suggests that although RWA and 8values approach authoritarianism from different perspectives, they largely measure overlapping aspects of the libertarian-authoritarian dimension. Additional model performance metrics are summarised in Table 2.

Table 2

Predictive performance of models for libertarian-authoritarian axis

Model	Test R^2	MAE	MSE	RMSE
RWA	0.36	0.76	0.93	0.95
8values	0.42	0.74	0.85	0.91
RWA + 8values	0.43	0.74	0.83	0.90

The combination of RWA and 8values produced the highest predictive performance for the libertarian-authoritarian axis, though the gain over using 8values alone was minimal. This suggests that while psychological and value-based dimensions offer slightly complementary insights, much of the explanatory power is already captured by 8values.

3.3. RQ3: Demographic effects

The third research question examined whether demographic factors influenced participants' ideology scores, self-identification or questionnaire preferences. Most participants came from Serbia, with a small number from Bosnia and Herzegovina. The sample consisted of individuals in their university years, with most of them being current students or recent graduates. Participants were recruited using a convenience sampling method that targeted university students through peer networks. Because the sample was relatively homogeneous in nationality, age and education, only gender differences were analysed (45 women, 15 men).

3.3.1. Ideological scores

To assess whether men and women differed in their responses to the ideological questionnaires, we performed independent-samples t-tests on the total scores for MFQ, SDO, RWA and 8values. The results revealed statistically significant gender differences on three out of the four instruments, as shown in Table 3. Women scored more liberal on MFQ, less authoritarian on RWA and more libertarian on the 8values government axis. No significant gender difference was found for SDO.

Table 3
Gender differences in political ideology scores across measures

Measure	$t(df)$	p -value	Mean (Women)	Mean (Men)	Interpretation
MFQ	-3.75 (32.04)	0.0007	-1.37	-0.58	Women scored significantly more liberal
SDO	-1.57 (29.16)	0.128	2.58	3.07	No significant difference
RWA	-2.13 (23.17)	0.034	70.49	89.40	Women scored significantly lower (less authoritarian)
8values (gov. axis)	3.69 (26.60)	0.001	56.52	46.20	Women scored significantly higher (more libertarian)

3.3.2. Political self-identification

To assess whether gender was associated with differences in political self-identification, we conducted Fisher's Exact Tests separately for each ideological axis. Women were more likely to place themselves as *Liberal* and *Strongly Liberal* on the liberal-conservative axis, while men were more likely to select *Conservative*. This pattern is also evident in Figure 2, which shows the distribution of self-placements by gender across the liberal-conservative dimension. On the libertarian-authoritarian axis, women predominantly identified as *Libertarian* or *Strongly Libertarian*, whereas three men identified as *Authoritarian*. This distribution is shown in Figure 3. Both effects were statistically significant (lib-con: $p = .0009$; lib-auth: $p = .011$). Overall, women in this sample were more likely to identify as *Liberal* and *Libertarian* compared to men. As with the questionnaire scores, the uneven gender distribution limits the generalizability of these findings and future studies with larger and more balanced samples are needed to validate these patterns in political self-identification.

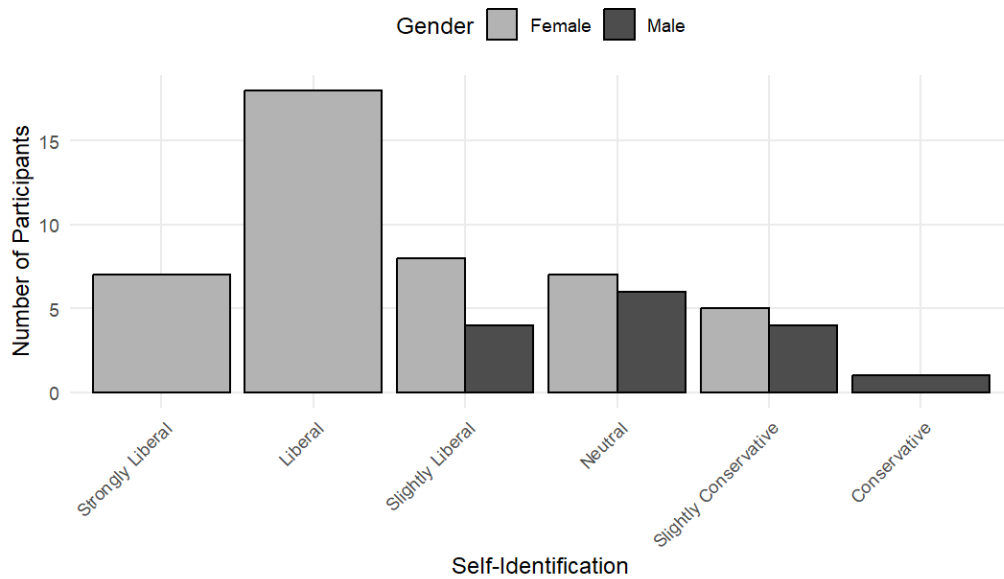


Figure 2: Distribution of self-identified liberal-conservative ideology by gender.

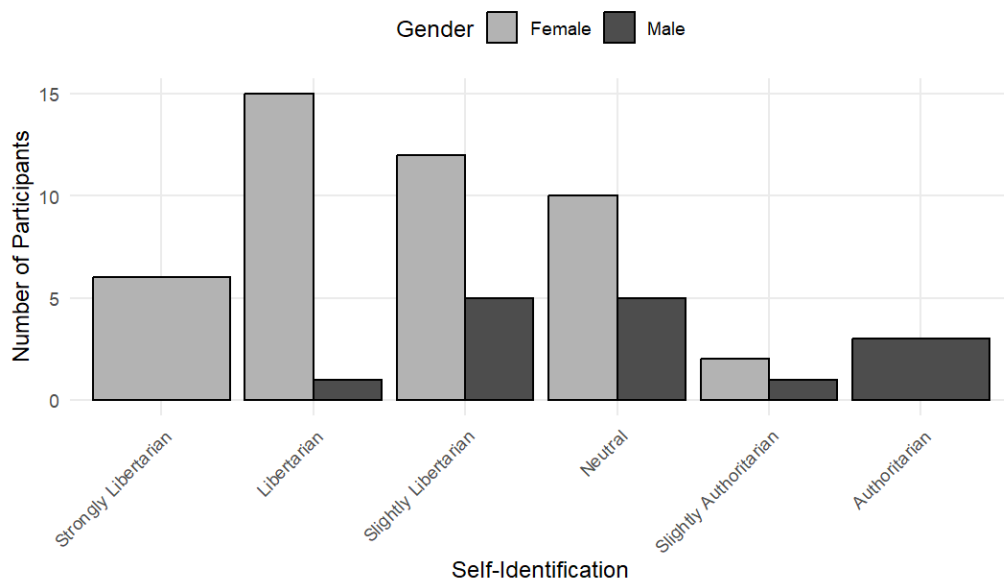


Figure 3: Distribution of self-identified libertarian-authoritarian ideology by gender.

3.3.3. Questionnaire preferences

To examine whether participants' preferences for the ideological questionnaires differed by gender, we conducted Fisher's Exact Tests separately for each political dimension. No significant gender differences were found in preferences between MFQ and SDO ($p = .340$). However, preferences between RWA and 8values differed significantly by gender ($p = .035$). However, to understand exactly how men and women differed in their preferences, a more detailed breakdown is needed. Because the sample was small and uneven (45 women and 15 men), these results should be interpreted with caution.

3.4. RQ4 & RQ5: Constructing a concise two-dimensional questionnaire

The fourth and fifth research questions asked whether a shorter two-dimensional questionnaire could be created and which specific items were most predictive of self-identification. We applied Lasso and

Random Forest models to select items and then validated the reduced scales psychometrically.

3.4.1. Item selection and predictive performance

Lasso regression selected 21 items for the liberal-conservative axis (14 MFQ, 7 SDO) and 25 items for the libertarian-authoritarian axis (9 RWA, 16 8values). Predictive performance was moderate. Summary of selected item counts and performance metrics for each axis is presented in Table 4.

Table 4

Model performance metrics across ideological axes

Axis	Questionnaires Used	No. of Items	R^2	MAE	MSE	RMSE
Liberal-Conservative	MFQ + SDO	21	0.321	0.866	1.130	1.050
Libertarian-Authoritarian	RWA + 8values	25	0.384	0.740	0.915	0.940

Random Forest achieved stronger results with similar item counts: 20 items (8 MFQ, 12 SDO) for the liberal-conservative axis and 24 items (14 RWA, 10 8values) for the libertarian-authoritarian axis. These models explained 45% and 47% of the variance respectively, outperforming Lasso and reducing error metrics. A summary of selected item counts and performance metrics from both Random Forest models is provided in the Table 5.

Table 5

Random Forest model performance across ideological axes

Axis	Questionnaires Used	No. of Items	R^2	MAE	MSE	RMSE
Liberal-Conservative	MFQ + SDO	20	0.454	0.740	0.936	0.946
Libertarian-Authoritarian	RWA + 8values	24	0.473	0.503	0.450	0.663

Random Forest got better results than Lasso across all performance metrics for both ideological dimensions. It achieved higher R^2 values, indicating stronger explanatory power. Additionally, Random Forest produced lower error rates (MAE, MSE and RMSE), suggesting more accurate and stable predictions. Because political self-placement is shaped by many overlapping factors, predictive fits in this area are typically modest; R^2 values around 0.10-0.50 are commonly considered reasonable for human-behaviour data[5]. These results suggest that Random Forest outperformed Lasso because it can better capture complex, non-linear patterns in participants' ideological responses. While Lasso regression is more appropriate for identifying a sparse set of linear predictors, its linear assumptions may have limited its effectiveness in this context, where non-linear relationships and interactions between questionnaire items likely play an important role.

3.4.2. Most predictive items

Using Random Forest feature importance (averaged across folds and 20 seeds, rescaled so that the top item equals 100), the strongest predictors reflected the theoretical focus of each instrument. For clarity and consistency, we refer to each question by its item code (e.g., MFQ15, SDO7, RWA12, VAL26). These codes correspond to the variable names used in the statistical analysis, while the full wording of each item is provided in the Appendix.

On the liberal-conservative axis, Random Forest selected 20 items in total:

- MFQ items: MFQ9, MFQ15, MFQ20, MFQ23, MFQ24, MFQ25, MFQ27, MFQ30
- SDO items: SDO1, SDO3, SDO4, SDO5, SDO6, SDO7, SDO8, SDO9, SDO10, SDO12, SDO13, SDO16

On the libertarian-authoritarian axis, 24 items were selected:

- RWA items: RWA1, RWA2, RWA3, RWA4, RWA8, RWA10, RWA11, RWA12, RWA13, RWA14, RWA15, RWA17, RWA19, RWA20
- 8values items: VAL3, VAL11, VAL23, VAL25, VAL26, VAL28, VAL29, VAL32, VAL36, VAL37

3.4.3. Psychometric validation

Following the machine learning item selection procedures, we used Confirmatory Factor Analysis (CFA) to test whether the reduced item set aligned with the hypothesised two-dimensional ideological structure.

The initial set of 44 items was derived from Random Forest feature selection on MFQ + SDO (liberal-conservative axis) and RWA + 8values (libertarian-authoritarian axis). Preliminary correlations had already indicated that some items were highly redundant (e.g., SDO9/SDO10, VAL29/VAL36) and this was later confirmed during CFA. After inspecting loadings and modification indices, one problematic item (MFQ15) was removed, leaving 43 items (19 and 24 per factor). To improve model fit, a few residual correlations were allowed between highly similar items, reducing misfit caused by shared variance not explained by the main factors. The final CFA model, estimated with maximum likelihood, showed moderate fit (CFI = 0.707, TLI = 0.688, RMSEA = 0.115, SRMR = 0.102), which is expected given the small sample size ($n = 60$) and high item count. Fixed cutoff values for fit indices like RMSEA and SRMR may be misleading when applied universally[6]. Importantly, factor loadings were generally strong and aligned with theory, with most exceeding 0.5 and some particularly high (RWA14 = 0.875, VAL26 = 0.903). The two latent factors were moderately correlated ($r = 0.57$), indicating that individuals with more conservative moral and social beliefs also tended to support stronger authority, while still supporting a two-dimensional structure of political ideology.

To evaluate the internal consistency of the shortened scales, we computed Cronbach's alpha for the final item subsets obtained from Random Forest selection. The liberal-conservative subset (19 items from MFQ and SDO) achieved $\alpha = 0.91$, with average inter-item correlations of 0.36 and item-total correlations ranging from 0.36 to 0.73, showing that all items contributed positively. The libertarian-authoritarian subset (24 items from RWA and 8values) achieved $\alpha = 0.92$, with average inter-item correlations of 0.44 and item-total correlations from 0.43 to 0.81, again indicating strong coherence. Both coefficients exceed the 0.80[4] threshold for high-stakes instruments, confirming that the reduced item sets remained reliable and internally consistent. Together with the CFA results, these findings suggest that the shortened scales form valid and dependable measures of ideological orientation on both dimensions.

Overall, the machine-learning approach successfully reduced the original 103 items to about 20-24 per axis without compromising validity or reliability, providing a concise two-dimensional questionnaire.

4. Discussion

This paper explored how political identity can be predicted and efficiently measured using a combination of scientific ideological questionnaires (MFQ, SDO, RWA) and the non-academic 8values test. Five research questions guided the study, ranging from predictive alignment to psychometric reduction.

4.1. RQ1: Alignment with self-identified ideology

The four questionnaires showed moderate to strong alignment with participants' political self-identification. MFQ and SDO were both correlated with the liberal-conservative axis, while RWA and 8values strongly captured the libertarian-authoritarian dimension. These findings confirm that traditional psychometric tools and even a popular online quiz can reflect how individuals perceive their own ideology.

4.2. RQ2: Capturing the two dimensions

Random Forest models demonstrated that MFQ and SDO together explained nearly half of the variance in liberal-conservative placement, while RWA and 8values provided similarly strong predictions for the libertarian-authoritarian axis. The results suggest that combining instruments adds complementary

information, but most explanatory power was already captured by the strongest single scale in each pair.

4.3. RQ3: Demographic influences

Gender differences emerged consistently. Women in the sample were more likely to identify as *Liberal* and *Libertarian* and their scores on MFQ, RWA and 8values reflected this orientation. Men leaned relatively more toward *Conservatism* and *Authoritarianism*. These effects should be interpreted cautiously, given the small and unbalanced sample, but they point to meaningful demographic influences.

4.4. RQ4: Constructing a concise questionnaire

Machine learning successfully reduced the original 103 items to 20-25 per axis without major losses in predictive power. Random Forest in particular outperformed Lasso, highlighting its advantage in modelling complex, non-linear patterns. The shortened scales captured most of the variance explained by the full instruments while significantly reducing item burden.

4.5. RQ5: Most predictive items

The strongest predictors mapped neatly onto theoretical expectations. On the liberal-conservative axis, moral foundations related to harm and fairness and SDO hierarchy items were most important. On the libertarian-authoritarian axis, RWA authority items and 8values statements about government control stood out. These results show that a small number of well-chosen items can represent the core of ideological measurement.

4.6. Overall interpretation

Taken together, the findings demonstrate that it is possible to build a shorter and reliable two-dimensional questionnaire for political identity. The proposed two-dimensional political identity questionnaire consists of 43 items: 19 capturing the liberal-conservative dimension (from MFQ and SDO) and 24 capturing the libertarian-authoritarian dimension (from RWA and 8values). Each item preserves its original phrasing, but the full set can be completed in about 7-10 minutes, compared to over 25 minutes for the original instruments. For example, liberal-conservative items focus on moral and social hierarchy statements such as "People should not do things that are disgusting, even if no one is harmed" or "It's probably a good thing that certain groups are at the top and other groups at the bottom," while libertarian-authoritarian items address attitudes toward governance and tradition, such as "Religion should play a role in government" or "Same-sex marriage should be legal."

The reduced item set provides a solid basis for a short-form political identity questionnaire. Such a tool would be useful in time-limited surveys, quick online quizzes or research contexts requiring efficient measurement. By focusing on the most predictive and non-redundant items, the final version preserves accuracy while improving user experience and data quality, turning lengthy instruments into practical tools.

5. Limitations and Future Work

Several limitations should be acknowledged. This study was limited by a small and relatively homogeneous sample ($n=60$), which restricts generalisability and statistical power. Most participants were young and politically engaged, leading to similar responses across some demographic categories. Predictive performance was moderate (R^2 up to 0.47), suggesting that while the models captured meaningful variance, they could not fully account for the complexity of ideological self-identification. The selected items were optimised on this dataset and may not generalise to other populations and potential biases such as socially desirable responding or anchoring effects cannot be ruled out. It is also worth mentioning that the original full-length questionnaires, when put together in our survey,

included a total of 103 items. This was time-consuming and may have contributed to participant fatigue, highlighting the value of creating shorter yet reliable scales. Future research should replicate the approach with larger and more diverse samples, test the stability of the reduced scales over time (e.g. test-retest reliability) and assess external validity in relation to real-world political behaviours. Exploring alternative feature-selection methods and additional psychometric checks could further strengthen the instrument.

6. Conclusion

This paper demonstrates that a concise, psychometrically valid political identity questionnaire can be constructed by combining existing instruments and applying machine learning alongside psychometric evaluation. A reduced set of around 20 items per axis was sufficient to capture self-identified positions on both the liberal-conservative and libertarian-authoritarian dimensions while maintaining strong reliability. By shortening lengthy scales without sacrificing validity, the proposed approach highlights a practical way to improve participant experience and research efficiency, paving the way for more accessible and data-driven tools for measuring political ideology.

References

- [1] B. Altemeyer, *The Authoritarians*, Department of Psychology, University of Manitoba, Winnipeg, Canada, 2006.
- [2] J. Graham, J. Haidt, B. A. Nosek, Liberals and conservatives rely on different sets of moral foundations, *J. Pers. Soc. Psychol.* 96 (2009) 1029–1046. doi:10.1037/a0015141
- [3] F. Pratto, J. Sidanius, L. M. Stallworth, B. F. Malle, Social dominance orientation: A personality variable predicting social and political attitudes, *J. Pers. Soc. Psychol.* 67 (1994) 741–763. doi:10.1037//0022-3514.67.4.741
- [4] D. George, P. Mallery, *IBM SPSS Statistics 26 Step by Step: A Simple Guide and Reference*, 16th ed., Routledge, New York, NY, 2019. doi:10.4324/9780429056765.
- [5] P. K. Ozili, The Acceptable R-Square in Empirical Modelling for Social Science Research, Munich Personal RePEc Archive, Paper No. 115769 (2023), pp. 1–22. URL: <https://mpira.ub.uni-muenchen.de/115769/>
- [6] K. Groskurth, M. Bluemke, C. M. Lechner, Why we need to abandon fixed cutoffs for goodness-of-fit indices: An extensive simulation and possible solutions, *Behav. Res. Methods* 56 (2024) 3891–3914. doi:10.3758/s13428-023-02193-3
- [7] M. D. Finkelman, N. Smits, R. J. Kulich, K. L. Zacharoff, B. E. Magnuson, H. Chang, J. Dong, and S. F. Butler, Development of short-form versions of the Screener and Opioid Assessment for Patients with Pain–Revised (SOAPP-R): A proof-of-principle study, *Pain Medicine* 18 (2017) 1292–1302. doi:10.1093/pm/pnw210

A. Full Item List of Ideological Questionnaires

Moral Foundations Questionnaire (MFQ):

- MFQ1 Whether or not someone suffered emotionally.
- MFQ2 Whether or not some people were treated differently than others.
- MFQ3 Whether or not someone's action showed love for his or her country.
- MFQ4 Whether or not someone showed a lack of respect for authority.
- MFQ5 Whether or not someone violated standards of purity and decency.
- MFQ6 Whether or not someone cared for someone weak or vulnerable.
- MFQ7 Whether or not someone acted unfairly.
- MFQ8 Whether or not someone did something to betray his or her group.
- MFQ9 Whether or not someone conformed to the traditions of society.
- MFQ10 Whether or not someone did something disgusting.
- MFQ11 Whether or not someone was cruel.
- MFQ12 Whether or not someone was denied his or her rights.
- MFQ13 Whether or not someone showed a lack of loyalty.
- MFQ14 Whether or not an action caused chaos or disorder.
- MFQ15 Whether or not someone acted in a way that God would approve of.
- MFQ16 Compassion for those who are suffering is the most crucial virtue.
- MFQ17 When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
- MFQ18 I am proud of my country's history.
- MFQ19 Respect for authority is something all children need to learn.
- MFQ20 People should not do things that are disgusting, even if no one is harmed.
- MFQ21 One of the worst things a person could do is hurt a defenseless animal.
- MFQ22 Justice is the most important requirement for a society.
- MFQ23 People should be loyal to their family members, even when they have done something wrong.
- MFQ24 Men and women each have different roles to play in society.
- MFQ25 I would call some acts wrong on the grounds that they are unnatural.
- MFQ26 It can never be right to kill a human being.
- MFQ27 I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
- MFQ28 It is more important to be a team player than to express oneself.
- MFQ29 If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
- MFQ30 Chastity is an important and valuable virtue.

Social Dominance Orientation (SDO):

- SDO1 Some groups of people are just more worthy than others.
- SDO2 In getting what you want, it is sometimes necessary to use force against other groups.
- SDO3 It's OK if some groups have more of a chance in life than others.
- SDO4 To get ahead in life, it is sometimes necessary to step on other groups.
- SDO5 If certain groups stayed in their place, we would have fewer problems.
- SDO6 It's probably a good thing that certain groups are at the top and other groups are at the bottom.
- SDO7 Inferior groups should stay in their place.
- SDO8 Sometimes other groups must be kept in their place.
- SDO9 It would be good if groups could be equal.

- SDO10 Group equality should be our ideal.
- SDO11 All groups should be given an equal chance in life.
- SDO12 We should do what we can to equalize conditions for different groups.
- SDO13 Increased social equality is beneficial to society.
- SDO14 We would have fewer problems if we treated people more equally.
- SDO15 We should strive to make incomes as equal as possible.
- SDO16 No group should dominate in society.

Right-Wing Authoritarianism (RWA):

- RWA1 Our country desperately needs a mighty leader who will do what has to be done to destroy the radical new ways and sinfulness that are ruining us.
- RWA2 Gays and lesbians are just as healthy and moral as anybody else.
- RWA3 It is always better to trust the judgement of the proper authorities in government and religion than to listen to the noisy rabble-rousers in our society who are trying to create doubt in people's minds.
- RWA4 Atheists and others who have rebelled against the established religions are no doubt every bit as good and virtuous as those who attend church regularly.
- RWA5 The only way our country can get through the crisis ahead is to get back to our traditional values, put some tough leaders in power and silence the troublemakers spreading bad ideas.
- RWA6 There is absolutely nothing wrong with nudist camps.
- RWA7 Our country needs free thinkers who have the courage to defy traditional ways, even if this upsets many people.
- RWA8 Our country will be destroyed someday if we do not smash the perversions eating away at our moral fiber and traditional beliefs.
- RWA9 Everyone should have their own lifestyle, religious beliefs, and sexual preferences, even if it makes them different from everyone else.
- RWA10 The "old-fashioned ways" and the "old-fashioned values" still show the best way to live.
- RWA11 You have to admire those who challenged the law and the majority's view by protesting for women's abortion rights, for animal rights, or to abolish school prayer.
- RWA12 What our country really needs is a strong, determined leader who will crush evil, and take us back to our true path.
- RWA13 Some of the best people in our country are those who are challenging our government, criticizing religion, and ignoring the "normal way things are supposed to be done."
- RWA14 God's laws about abortion, pornography and marriage must be strictly followed before it is too late, and those who break them must be strongly punished.
- RWA15 There are many radical, immoral people in our country today, who are trying to ruin it for their own godless purposes, whom the authorities should put out of action.
- RWA16 A "woman's place" should be wherever she wants to be. The days when women are submissive to their husbands and social conventions belong strictly in the past.
- RWA17 Our country will be great if we honor the ways of our forefathers, do what the authorities tell us to do, and get rid of the "rotten apples" who are ruining everything.
- RWA18 There is no "one right way" to live life; everybody has to create their own way.
- RWA19 Homosexuals and feminists should be praised for being brave enough to defy "traditional family values."
- RWA20 This country would work a lot better if certain groups of troublemakers would just shut up and accept their group's traditional place in society.

8values - Government Axis Items:

- VAL1 Oppression by corporations is more of a concern than oppression by governments.

- VAL2 Tariffs on international trade are important to encourage local production.
- VAL3 The United Nations should be abolished.
- VAL4 Military action by our nation is often necessary to protect it.
- VAL5 I support regional unions, such as the European Union.
- VAL6 It is important to maintain our national sovereignty.
- VAL7 Wars do not need to be justified to other countries.
- VAL8 Military spending is a waste of money.
- VAL9 Governments should be accountable to the international community.
- VAL10 Even when protesting an authoritarian government, violence is not acceptable.
- VAL11 My religious values should be spread as much as possible.
- VAL12 Our nation's values should be spread as much as possible.
- VAL13 It is very important to maintain law and order.
- VAL14 The general populace makes poor decisions.
- VAL15 Physician-assisted suicide should be legal.
- VAL16 The sacrifice of some civil liberties is necessary to protect us from acts of terrorism.
- VAL17 Government surveillance is necessary in the modern world.
- VAL18 The very existence of the state is a threat to our liberty.
- VAL19 Regardless of political opinions, it is important to side with your country.
- VAL20 All authority should be questioned.
- VAL21 A hierarchical state is best.
- VAL22 It is important that the government follows the majority opinion, even if it is wrong.
- VAL23 The stronger the leadership, the better.
- VAL24 Democracy is more than a decision-making process.
- VAL25 Children should be educated in religious or traditional values.
- VAL26 Religion should play a role in government.
- VAL27 Drug use should be legalized or decriminalized.
- VAL28 Same-sex marriage should be legal.
- VAL29 No cultures are superior to others.
- VAL30 Sex outside marriage is immoral.
- VAL31 If we accept migrants at all, it is important that they assimilate into our culture.
- VAL32 Abortion should be prohibited in most or all cases.
- VAL33 Gun ownership should be prohibited for those without a valid reason.
- VAL34 Prostitution should be illegal.
- VAL35 We should open our borders to immigration.
- VAL36 All people - regardless of factors like culture or sexuality - should be treated equally.
- VAL37 It is important that we further my group's goals above all others.