

Is Political Trust Multidimensional? A Principal Component Analysis of EU Countries

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Introduction

Trust in political institutions is widely recognized as a fundamental component of democratic governance, shaping citizens' perceptions of institutional legitimacy and influencing their engagement with political processes (Smets, Hooghe & Quintelie, 2013). Much of the existing literature aims to explore the underlying structure of political trust, questioning whether it is fundamentally unidimensional or composed of multiple related dimensions (Smets, Hooghe & Quintelie, 2013). Some authors argue that political trust is a singular, unified construct, assuming that trust in different political institutions – such as politicians, political parties, parliaments, law enforcement, and legal systems – reflects a common underlying dimension (Smets, Hooghe & Quintelie, 2013). Conversely, others contend that political trust may be better understood as a multidimensional concept, encompassing distinct dimensions such as trust in domestic versus international institutions (Arnold, Sapir & Zapryanova, 2012).

This paper critically examines the dimensionality of political trust using empirical data from the European Social Survey (ESS). By employing Principal Component Analysis (PCA) and regression modelling, the study seeks to determine whether trust in political institutions can be meaningfully represented as a single latent construct or whether multiple distinct dimensions better reflect the structure of citizens' attitudes. In addition to testing this at the overall European level, the analysis compares Scandinavian and Mediterranean countries to assess how regional contexts influence the latent structure of trust.

The results of this study indicate that political trust across the EU does not align neatly with a unidimensional construct. Instead, trust appears to reflect at least two distinct dimensions – one associated with domestic institutions and another with international bodies. Furthermore, regression analysis shows that left-right ideological orientation is a significant predictor of variation in trust, with right-leaning individuals generally exhibiting lower levels of trust in international institutions.

This paper contributes to the growing literature challenging the assumption of political trust as a unidimensional construct. It also highlights regional variation in political trust, showing that the structure of trust may differ between high-trust and low-trust societies within the EU. Together, these findings have important implications for how political trust is measured, interpreted, and compared across countries.

Literature Review

Political trust is widely recognised as the cornerstone of democratic legitimacy and is an essential component of well-functioning political systems. However, the nature of trust in political institutions, and whether this should be viewed as a single- or multi-dimensional concept, is a continuously debated topic in the literature. This section outlines the key arguments supporting both perspectives.

Institutional Trust as a Unidimensional Concept

The prevailing argument for treating institutional trust as a one-dimensional concept arises from the belief that institutions do not function in isolation; rather, they exist within the broader context of a country's political system and culture (Marin, 2011). Consequently, citizens are believed to form a generalised attitude toward trust in political institutions that applies broadly across institutional types (Marien, 2011).

Empirical support for this position is found in studies such as Smets, Hooghe & Quintelie (2013) who perform PCA on multiple rounds of ESS, Likert-scale, data in Belgium. Their findings indicate that trust in a variety of institutions – including the legal system, the police, the United Nations, and the European Parliament – all load significantly onto a single latent dimension. This is interpreted as evidence that these indicators reflect a shared underlying attitude: generalised institutional trust.

While this analysis provides a useful contribution to the conceptualisation of political trust in a single-country context, it begs the question whether this pattern holds across a range of countries with diverse political histories and trust cultures. My analysis seeks to expand on this gap by examining the dimensionality of political trust across all EU countries using ESS data.

Institutional Trust as a Multidimensional Concept

Contrasting with the unidimensional approach, another body of literature argues that trust in institutions should be understood as inherently multidimensional. According to this view, citizens don't assess institutions through a single lens, rather their opinions are shaped by their personal experiences, political knowledge, and exposure to institutional performance (Fisher, Van Heerde, & Tucker, 2010). As a result, trust in domestic political bodies (e.g., parliament, politicians, police) may diverge significantly from trust in supranational or international institutions (e.g., the EU, UN).

To this end, Fisher et al. (2010) argue that the operationalisation of trust as a unidimensional concept in the political sciences "fails to tap into the full range of meanings of the concept." As such, they argue that any attempts to model individual variations of trust will lead to misleading conclusions if the underlying political trust measure is assumed to be unidimensional. Their empirical findings demonstrate that trust levels differ significantly based on the political institution in question, lending strong support to a multidimensional approach.

Given the lack of consensus in the literature, this paper seeks to contribute by providing a robust assessment of the dimensionality of political trust using data from the European Social Survey. In particular, it compares trust patterns across a broad set of EU countries, and further examines variation by contrasting high-trust (Scandinavian) and low-trust (Mediterranean) regions (Marozzi, 2014). To the best of my knowledge, this form of cross-national, regionally disaggregated analysis has not been conducted in the Political Sciences literature to date.

Hypotheses

Building on the literature, this paper adopts the view that institutional trust is shaped by personal experiences and exposure to institutional performance. Specifically, individuals may form contrasting judgments toward domestic institutions, which are directly tied to local politics, versus international institutions, which are shaped by supranational governance. In high-trust countries, where institutional performance is generally perceived as effective, this separation may be more clearly defined. Conversely, in low-trust regions, trust judgments may be less differentiated, reflecting more generalized political disillusionment.

This theoretical framework gives rise to the following testable hypotheses:

H1: Trust in political institutions in the EU is best represented as a multidimensional construct, rather than a single latent dimension.

H2: The separation between domestic and international trust dimensions is more distinct in Scandinavian countries (high-trust) than in Mediterranean countries (low-trust).

Data

Data for PCA

This study uses individual-level response data from round nine of the ESS dataset, collected across 29 EU countries by means of face-to-face interviews. The ESS dataset consists of cross-sectional data that are representative of all persons aged 15 and over resident within private households in each country, making it suitable for cross-country analysis (European Social Survey, n.d.).

Trust in political institutions is operationalised in the ESS dataset through a series of Likert-scale type questions assessing respondents’ trust levels in various institutions. Specifically, respondents rated their trust in the national parliament, legal system, police, politicians, the European Parliament, and the United Nations on a scale from 0 (no trust at all) to 10 (complete trust).

The overall dataset included 49519 respondents. Missing data were indicated using specific codes for respondents who refused to answer (77), responded “don’t know” (88), or gave no response (99). These non-responses totalled 6,391 observations and were removed prior to analysis. The highest missingness was observed for trust in the United Nations (4,389 cases). Nonetheless, the overall representativeness of the ESS sample suggests these missing values are unlikely to be systematically biased or non-random. Furthermore, even after removing all non-responses from the dataset, the total observations still exceeded 43 000 – sufficient for statistical analysis. Given the size and nature of the dataset, listwise deletion was therefore considered appropriate.

Data for Regression Analysis

Wave 9 of the ESS dataset also includes multiple individual-level variables that were appropriate for regression analysis. Variable selection was informed by prior research on political trust determinants (e.g., Mingo & Faggiano, 2020; Kaasa & Andriani, 2021). These variables included demographic characteristics such as respondent age and gender, ideological orientation measured by left-right self-placement and indicators of respondents’ overall satisfaction with life and democracy.

Methodology

Principal Component Analysis (PCA) is used in this paper to measure whether trust in institutions (political trust) is a unidimensional or multidimensional construct. PCA is a dimensionality reduction technique, performed on continuous data, that reduces the dimensionality of large datasets by creating uncorrelated components that maximize variance while minimizing information loss (Jolliffe & Cadima, 2016).

The use of PCA in the context of this paper follows established precedent in political science research, where it has been applied to uncover latent structures underlying institutional trust measured via Likert-scale items (for example, Zmerli & Newton, 2008; Smets, Hooghe & Quintelie, 2013).

PCA is typically based on Pearson correlation matrices. However, given that Pearson correlations assume interval-level data, polychoric correlations were used to more appropriately model the ordinal nature of the Likert-scale ESS data on political trust (Holgado-Tello et al., 2010). A comparison between the polychoric and Pearson correlation matrices in the appendix (Tables 5 and 6) suggests that the polychoric matrix slightly improves the strength of correlations, supporting its use in the analysis.

Initially, PCA was performed on all 29 EU countries in the ESS dataset. To explore potential cross-regional variation in the dimensionality of political trust, the dataset was then subset into two regional groups: Scandinavian and Mediterranean countries¹. The choice to subset the data into these regions is informed by a previous study (Marozzi, 2014) which measured that Scandinavian countries display the highest levels of political trust of all EU countries, while Mediterranean countries typically display the lowest levels of political trust. Conducting PCA on different subsets of countries adds robustness to the findings by testing whether the dimensionality of political trust holds consistently across socio-political contexts.

PCA is an appropriate approach for this analysis as it can be used to test the extent that each political trust item loads onto principal components. If all variables load strongly onto the same principal component, this would support a unidimensional structure of trust – suggesting the items measure a single underlying construct, namely institutional trust. Conversely, if the loadings are distributed across multiple components, this would indicate a multidimensional structure of trust in institutions.

¹The Scandinavian group includes Denmark, Sweden, Norway, and Finland. The Mediterranean group includes Spain, Italy, Portugal and Greece.

Results

PCA

Principal Component Analysis using polychoric correlations was conducted separately for the full EU sample, Scandinavian countries, and Mediterranean countries to assess the dimensionality of institutional trust.

The PCA was run with two components based on analysis of the scree plots and cumulative variance explained, which indicated that the first two factors had eigenvalues greater than 1 across all three subsamples (Appendix tables 7, 8 and 9). In the full EU sample, PC1 accounts for 47.5% of the total variance and is best interpreted as a measure of trust in national institutions. National trust measures such as trust in parliament, politicians and political parties are all highly correlated with the component (0.7), indicating these items are strongly associated with a common latent dimension. Conversely, trust in the European Parliament and the United Nations show notably weaker correlations with PC1 (both below 0.6), suggesting they are not central to this national trust dimension.

The second component (PC2) accounts for 16.9% of the total variance and appears to represent trust in international institutions. The international trust variables load strongly and positively onto this component, while the national trust indicators load negatively, reinforcing the interpretation that this component captures an opposing dimension of trust that is distinct from the first. This provides strong evidence in support of the multidimensional nature of political trust, with two underlying constructs: one for domestic trust and another for international trust.

Table 1: Principal Component Analysis Results for EU Countries

	Loading PC1	Contrib PC1	Cos ² PC1	Loading PC2	Contrib PC2	Cos ² PC2
Trust in parliament	0.694	19.1	0.481	-0.219	4.0	0.048
Trust in the legal system	0.579	13.3	0.336	-0.072	0.4	0.005
Trust in the police	0.490	9.6	0.240	-0.167	2.3	0.028
Trust in politicians	0.794	25.1	0.631	-0.225	4.2	0.051
Trust in political parties	0.716	20.4	0.513	-0.161	2.2	0.026
Trust in the European Parliament	0.369	5.4	0.136	0.743	46.2	0.552
Trust in the United Nations	0.424	7.1	0.180	0.696	40.6	0.485

The results are broadly similar for both the Scandinavian and Mediterranean country subsets of the data, with some slight differences in loadings. Scandinavian countries display an even stronger separation between trust in domestic and international institutions. While international trust variables load modestly (around 0.4) on PC1, their loadings increase substantially – up to 0.7 – on PC2.

Table 2: Principal Component Analysis Results for Scandinavian Countries

	Loading PC1	Contrib PC1	Cos ² PC1	Loading PC2	Contrib PC2	Cos ² PC2
Trust in parliament	0.694	19.1	0.481	-0.219	4.0	0.048
Trust in the legal system	0.579	13.3	0.336	-0.072	0.4	0.005
Trust in the police	0.490	9.6	0.240	-0.167	2.3	0.028
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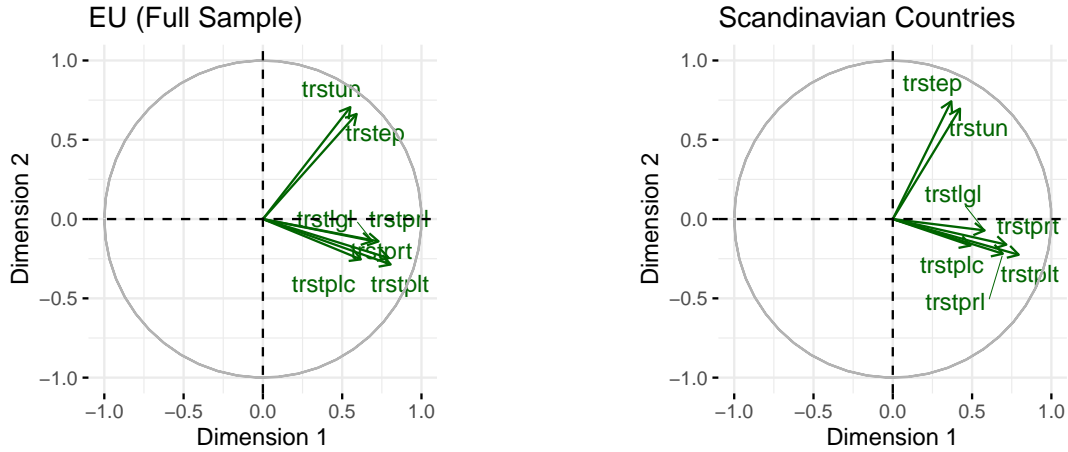
In contrast, the Mediterranean country subset reveals slightly more overlap between national and international indicators across both components. Although trust in the European Parliament and United Nations still load heavily onto PC2, their contribution to PC1 is also slightly higher than in the Scandinavian case, indicating that trust in institutions may be slightly more of a one-dimensional construct in this region. Ultimately, this suggests that while the two-dimensional structure of political trust is consistent, the degree of separation between dimensions varies across regions.

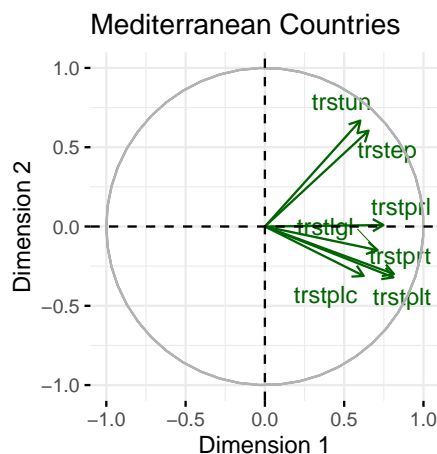
Table 3: Principal Component Analysis Results for Mediterranean Countries

	Loading PC1	Contrib PC1	Cos ² PC1	Loading PC2	Contrib PC2	Cos ² PC2
Trust in parliament	0.748	15.7	0.559	0.009	0.0	0.000
Trust in the legal system	0.711	14.2	0.505	-0.149	2.0	0.022
Trust in the police	0.623	10.9	0.388	-0.312	8.6	0.097
Trust in politicians	0.810	18.4	0.657	-0.321	9.2	0.103
Trust in political parties	0.813	18.6	0.662	-0.300	8.0	0.090
Trust in the European Parliament	0.654	12.0	0.427	0.604	32.5	0.365
Trust in the United Nations	0.602	10.2	0.362	0.668	39.7	0.446

Visual inspection through biplots strengthens these findings. In each regional subset, domestic trust variables cluster along PC1, while international trust indicators diverge along PC2. The contrast between the Scandinavian and Mediterranean plots visually reinforces the slight differences in separation between these regions.

Biplots





Regression

Table 4: Regression Results: PC1 and PC2

	<i>Dependent variable:</i>	
	PC1 (1)	PC2 (2)
Left-Right Scale	0.010*** (0.002)	-0.007*** (0.002)
Age	0.00005 (0.0001)	0.001*** (0.0001)
Education (Years)	0.001 (0.001)	-0.002*** (0.001)
Female	0.076*** (0.011)	0.070*** (0.009)
Sat. with Democracy	0.030*** (0.001)	0.007*** (0.0004)
Sat. with Life	0.018*** (0.001)	-0.008*** (0.001)
General trust in People	0.025*** (0.001)	-0.006*** (0.001)
Political Interest	0.008 (0.006)	0.082*** (0.005)
Constant	-0.752*** (0.028)	-0.215*** (0.022)
Observations	42,253	42,253
R ²	0.084	0.021
Adjusted R ²	0.084	0.021
Residual Std. Error (df = 42244)	1.151	0.923
F Statistic (df = 8; 42244)	486.121***	114.359***
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

Linear regressions were run on the full set of EU countries in the data set. The first model uses scores from PC1 as the dependent variable, while the second model uses scores from PC2. In the first model the left-right ideological scale has a significant positive coefficient, indicating that those who position themselves further to the right tend to report relatively higher levels of trust in domestic institutions than those who are further left on the ideological scale. Conversely, being further right is associated with lower scores on PC2

indicating that right-leaning individuals display less trust in international institutions relative to left-leaning individuals. This divergence highlights the importance of treating political trust as a multidimensional concept. Rather than reflecting a single unified attitude, political trust varies across institutional types - with ideological orientation shaping trust in domestic institutions differently than trust in international ones.

Other significant predictors include satisfaction with democracy and life, political interest, and interpersonal trust. While the regression analysis is not the primary focus of this paper, the results point to potential avenues for further investigation into the determinants of political trust across institutional domains.

Discussion

Ultimately, the results of this paper strongly indicate that institutional trust is best understood as a multidimensional construct. PCA revealed two distinct components across the full ESS sample: one reflecting trust in national institutions, and the other capturing trust in international or supranational bodies. Importantly, this two-dimensional structure was consistent across regional subsets, including Scandinavian countries – traditionally associated with high political trust – and Mediterranean countries, which tend to exhibit lower institutional trust. The robustness of this structure across diverse political cultures strengthens the claim that trust in institutions cannot be reduced to a single latent dimension.

The findings are a significant contribution to the ongoing debate surrounding the dimensionality of political trust, which has yet to reach consensus. While previous studies have offered mixed evidence, this paper demonstrates the value of applying latent variable techniques like PCA to a comparative European context.

While the findings are significant, the results here are limited to a single wave of ESS data. In light of this, future research should explore whether the two-dimensional structure of institutional trust holds across time by incorporating multiple ESS rounds. Furthermore, extending this analysis beyond the EU to include countries with significantly different institutional histories and political cultures would offer further insight into the generalisability of the findings.

Final Word Count: 2433

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Appendix

Table 5: Pearson Correlation Matrix

	trstprl	trstlgl	trstplc	trstpplt	trstpplt	trstep	trstun
trstprl	1.00	0.44	0.35	0.54	0.51	0.31	0.28
trstlgl	0.44	1.00	0.47	0.43	0.41	0.29	0.27
trstplc	0.35	0.47	1.00	0.41	0.37	0.21	0.19
trstpplt	0.54	0.43	0.41	1.00	0.78	0.29	0.26
trstpplt	0.51	0.41	0.37	0.78	1.00	0.31	0.27
trstep	0.31	0.29	0.21	0.29	0.31	1.00	0.60
trstun	0.28	0.27	0.19	0.26	0.27	0.60	1.00

Table 6: Polychoric Correlation Matrix

	trstprl	trstlgl	trstplc	trstpplt	trstpplt	trstep	trstun
trstprl	1.00	0.66	0.52	0.74	0.71	0.50	0.42
trstlgl	0.66	1.00	0.67	0.61	0.58	0.46	0.42
trstplc	0.52	0.67	1.00	0.50	0.47	0.37	0.37
trstpplt	0.74	0.61	0.50	1.00	0.91	0.52	0.43
trstpplt	0.71	0.58	0.47	0.91	1.00	0.54	0.44
trstep	0.50	0.46	0.37	0.52	0.54	1.00	0.71
trstun	0.42	0.42	0.37	0.43	0.44	0.71	1.00

Table 7: Principal Component Eigenvalues and Varaince (EU)

	Eigenvalue	Variance	Cumulative.Variance
PC1	3.323	47.5	47.5
PC2	1.183	16.9	64.4
PC3	0.805	11.5	75.9
PC4	0.576	8.2	84.1
PC5	0.487	7.0	91.1
PC6	0.403	5.8	96.8
PC7	0.222	3.2	100.0

Table 8: Principal Component Eigenvalues and Varaince (Scandinavia)

	Eigenvalue	Variance	Cumulative.Variance
PC1	3.323	47.5	47.5
PC2	1.183	16.9	64.4
PC3	0.805	11.5	75.9
PC4	0.576	8.2	84.1
PC5	0.487	7.0	91.1
PC6	0.403	5.8	96.8
PC7	0.222	3.2	100.0

Table 9: Principal Component Eigenvalues and Variance (Mediterranean)

	Eigenvalue	Variance	Cumulative Variance
PC1	3.559	50.8	50.8
PC2	1.124	16.1	66.9
PC3	0.764	10.9	77.8
PC4	0.569	8.1	85.9
PC5	0.452	6.5	92.4
PC6	0.365	5.2	97.6
PC7	0.166	2.4	100.0

Code Repository

All code used in this project is available here:

<https://github.com/dheneck/Dimensionality-Reduction-Code>