# The political belief systems of Italian voters

## Abstract

This article investigates the Italian political belief system, which is the structure of meaning in which political attitudes are embedded. Two kinds of correlational models are employed to scrutinize belief systems, representing beliefs as nodes in a weighted network. Their weighted edges are derived from survey data collected following the 2022 Italian general election. Consistently with the theory of social constraint, results show that the amount of organization of belief systems is positively correlated with individual levels of political interest. Notably, belief constraint is not linked to individual levels of education. Additionally, the article reveals substantial differences in the belief systems of voters aligned with the left, right, and the Five Star Movement. These electorates construe political competition in different ways and associate political parties with distinct political issues. The article enhances the understanding of the structure of Italian political attitudes and bridges the gap between two categories of network models that have been applied in separate research domains so far.

## 1. Introduction

Political scientists have long explored the *levels* of public attitudes. Many scholars have investigated the links between political attitudes and voting behaviors (e.g.: Sandri & Seddone, 2015; Schoen & Schumann, 2007). Others have isolated the determinants of attitudes toward political institutions, such as the European Union (Conti & Memoli, 2015; Tucker et al., 2002). A parallel strand of research examined attitudes towards hot socio-political issues like the environment (Benedetta & Vincenzo, 2020), conspiracy theories (Vezzoni et al., 2022), and political violence (Vegetti & Littvay, 2022). However, most of the literature has overlooked the broader *structure* in which political attitudes are embedded, which is the focus of this article. Political beliefs are not held in isolation, as individuals are at least partially motivated to assume coherent stances on the political issues gravitating in the public arena. This was first noted by Converse in his notorious study of the North American belief system (2006). Since his contribution, scholars from different disciplines have made great advancements in the field. These improvements have often been triggered by methodological innovations, such as network models in which political attitudes measured through surveys are treated as nodes of a weighted network representing the associations among these beliefs. Studies have shown that the amount of organization of a belief system is related to individual levels of political information and that political attitudes are organized around political identities (Boutyline & Vaisey, 2017), which are central to this system (Brandt et al., 2019). It can be argued that this body of work is characterized by two intertwined limitations. First, most of the research in this field analyzed North American attitudes exclusively. This entails that belief systems theory necessitates confirmation from other research settings. Second, the focus on the United States may have led to overlooking an important research question: how do belief systems vary among voters of different parties? In a bipartisan political system, huge differences are unlikely to emerge, as issue ownership is sharper and political cues clearer. However, the situation could change dramatically in more pluralized party systems.

The remainder of the article aims to address these open questions. Section 2 reviews the findings and methodological strategies adopted by scholars of the three waves of studies on political belief systems. Section 3 details the twofold analytical strategy of this contribution. First, correlational networks are estimated to evaluate whether the amount of organization of belief systems varies according to political interest and educational levels. Second, newer models coming from political psychology are fitted to the electorates of the main Italian political formations. Results show that the amount of organization of the Italian belief system is mostly determined by political interest and that voters of different parties possess markedly different belief systems. The Conclusions stress the limitations and contributions of the research while suggesting future directions for the fourth wave of studies on the topic.

## 2. Theory

### 2.1 The network approach to political attitudes in political science

In his seminal contribution, Converse (2006) examined attitudes toward a wide range of issues central to U.S. public debate to study the nature and functioning of the attitudinal structure in which political beliefs are embedded. The author named this structure as a political belief system, noting that other potential labels, first and foremost that of ideology, were already polluted by their adoption in lay political jargon, and widely contested within political philosophy. He defined a political belief system “as a configuration of ideas and attitudes in which the elements are bound together by some form of constraint or functional interdependence” (Converse, 2006; p.3). Although this work has attracted academic interest from disciplines as disparate as sociology, political psychology, and network science, subsequent work on this topic is substantially dependent on Converse's definition (Boutyline & Vaisey, 2017; Brandt et al., 2019; Jost, 2006; Keskintürk, 2022b). Central to this definition are two elements. First, belief systems are composed of attitudes, which are “general evaluation[s] that people hold regarding a particular entity”, known as the attitude objects (Lavrakas, 2008; p.38). This article focuses on political attitudes, which are evaluations of politically denoted attitudes objects. Second, political beliefs are causally connected. Indeed, Converse posited that the positions individuals adopt on political attitudes are influenced by the positions they hold on other political attitudes (static constraint) and that a change of opinion on one political belief is likely to be followed by readjustments on other related issues (dynamic constraint). Most of Converse's work has dealt with the sources of static constraint. His empirical scrutiny of North Americans’ attitudes led him to conclude these sources are “much less logical [...] than they are psychological – and less psychological than social” (Converse, 2006; p. 5). Converse found that correlations between political beliefs were very low at the aggregate level, with individuals declaring liberals (conservatives) failing to express higher preferences for liberal (conservative) policies. Correlations were higher, and political attitudes were more stable, only for the *ideologues*, who represented about 3% of the population. In addition, ideologues and the lay public differed greatly in political knowledge and, relatedly, educational levels. Converse proposed that political attitudes are tightly structured within a belief system primarily among individuals with high levels of political knowledge. These individuals are more likely to be informed about key political issues and the positions held by their preferred political party, enabling greater constraint in their belief systems. This socio-centric[[1]](#footnote-1) explanation of attitudinal constraint constitutes another important legacy of Converse’s work. Indeed, subsequent empirical evidence fits Converse’s top-down theoretical model in which public attitudes are shaped by political elites. Voters have been found to rely on partisan heuristics when assuming their stances on political attitudes (Zaller, 1992), and experimental evidence confirms that framing a policy proposal as praised by a particular party substantially increases the likelihood that supporters of that party will endorse it and that voters of different parties will ostracize it (Cohen, 2003; Malka & Lelkes, 2010).

The socio-centric theory of belief systems can be expanded in an underexplored direction, leading to a bi-dimensional conceptualization of belief constraint. According to this view, political parties serve as cognitive authorities that influence public discourse through their political messaging (Martin, 2002). Political knowledge is thus essential for a well-organized belief system, as only the most informed individuals can process and respond to political cues delivered by elites. In this top-down model, political interest plays a critical role in determining the coherence of a belief system. Individuals with higher political knowledge are expected to exhibit more interconnected belief systems, resulting in political attitudes that are more *predictive* of each other. I label this dimension of constraint as *belief tightness*. However, when voters receive conflicting party cues about how to support central political issues, the relationships between political attitudes are likely *moderated* by vote choice. I label this dimension of constraint as *consensus.* When consensus is high, voters of different parties organize their support for political parties and political issues similarly. In such a situation, voters might possess belief systems with varying degrees of tightness, most likely depending on their level of political interest. Yet, voters largely agree on the pattern of relationships between political ideas, being able to clearly distinguish between rightist or leftist parties, and between right and left-owned political issues. Conversely, when political elites disseminate divergent messages—reflecting low consensus—voters disagree on how party and issue support should be structured. In such cases, measuring belief tightness becomes problematic, as voters from different parties organize their political beliefs in fundamentally different ways.

**2.1 Modelling a belief system: from BNA to partial correlation networks**

Furthermore, the seminal study of Converse is characterized by a severe methodological limitation, which lies in the marked discrepancy between his theoretical account and his empirical investigation of political belief systems. Political belief systems are described as *networks* of *causally interacting* beliefs. However, Converse backed his theory with simple bivariate analyses of correlation coefficients between political attitudes and other qualitative data.

A more rigorous test of the constraint hypothesis was provided about fifty years later by Boutyline and Vaisey, who developed Belief Network Analysis [BNA] (Boutyline & Vaisey, 2017). BNA renders attitudes as nodes of a network whose weighted edges are estimated from survey data. In correlational networks, edge thickness corresponds to the squared value of pairwise correlations between the selected attitudinal items. Their work has shown that belief tightness varies across levels of political knowledge, as the average correlation between political attitudes is higher for more informed North American voters. More recent applications of BNA have followed two main directions. One contribution tested the tightness hypothesis comparatively, finding that political attitudes are more correlated in countries where parties are more institutionalized, and individuals are more politically active (Keskintürk, 2022b). Another contribution employed correlational networks in combination with community detection techniques to show that socio-political attitudes of the U.S. public have become more polarized in recent years (DellaPosta, 2020). BNA has advanced the field by testing Converse’s theory with network models. However, these works remain anchored to a correlational approach.

To address the tension between the causal assumptions underlying intra-attitudinal relationships and their examination using simple correlational methods, Brandt and colleagues suggested utilizing recent advancements in psychometric modeling (Brandt et al., 2019). These models are based on partial correlations and differ in two substantial aspects from BNA’s correlational networks. First, the edges of correlational networks represent the squared value of the correlation coefficient observed between a set of survey items. This entails that edges are weighted, but not signed. Thus, these models are not able to capture the heterogeneities that may occur between belief systems of different social groups[[2]](#footnote-2). Second, many of the edges modeled in BNA are likely to be spurious, as pairwise correlations do not consider the role of any possible confounding factor. Thus, the adoption of partial correlation models improves the validity of the empirical scrutiny of belief systems, as they allow researchers to focus on the portion of unique variance shared by each pair of beliefs[[3]](#footnote-3). Cross-sectional studies within this second wave of studies developed along two lines of research. Some scholars have addressed the structural features of belief systems. Scholars have found that *symbolic* beliefs are more central than *operational* ones (Brandt et al., 2019; Fishman & Davis, 2022). These concepts derive from public opinion research, wherein scholars have distinguished between attitudes that tap into abstract and affective political labels (symbolic beliefs) and opinions regarding more concrete political issues, such as policy proposals that could be implemented by political actors (Ellis & Stimson, 2012; Free & Cantril, 1968). Other studies have focused on the dimensionality of belief systems, showing that they are not reducible to a single latent factor featuring the left-right poles, but rather composed of three (Cicco et al., 2023) to five (Sindermann et al., in press) dimensions.

### 2.3 Research hypotheses

Although one contribution has analyzed belief systems comparatively (Keskintürk, 2022b), no empirical contribution has explored the Italian political belief system directly. Moreover, Italy is an interesting case study, as it is a multiparty system characterized by intense political competition among several political actors. Hence, this country offers the perfect setting to evaluate the interplays between the two dimensions of constraint: tightness and consensus. This research examines Italian political attitudes in the aftermath of the September 2022 general election, when the rightist coalition formed by Fratelli d’Italia (*Brothers of Italy* [FDI]), Lega (*League* [L]), and Forza Italia (*Go Italy* [FI]) won the relative majority of parliamentary seats (43,8%). The second biggest coalition was the leftist one, composed of Partito Democratico (*Democratic Party* [PD]), Alleanza Verdi e Sinistra Italiana (*Green and Left Alliance* [GLA]), and +Europa *(+Europe* [+E]). This coalition won 26,1% of valid votes. Finally, the Movimento 5 Stelle (*Five Stars Movement* [M5S]) ran alone winning 15,4 % of votes, and a centrist alliance gathered 7,8% of valid preferences (Giovannini et al., 2023).

This research will test three hypotheses that can be derived from the political belief systems literature. First, I examine the tightness of Italian political attitudes. The theory of social constraint posits beliefs are more interconnected, and thus more predictive of each, in the presence of high political knowledge. However, this account necessitates further examination in other countries. Thus:

*H1: Tightness hypothesis.* The belief system of people with high political knowledge is tighter than that of people with low political knowledge.

Second, I investigate an alternative hypothesis explaining the degree of organization of belief systems. Indeed, as already recognized by Converse (2006), the role of education could be similar to that of political knowledge, and the two variables are *de facto* highly correlated in Western societies (Grönlund & Milner, 2006). Consistently, prior studies based on non-network methodologies have found that attitudes of the highly educated respondents are more stable and consistent than those of the average public (Judd & Krosnick, 1982; Judd & Milburn, 1980; Peffley & Hurwitz, 1985). However, recent contributions have also examined this issue with a network approach, finding mixed results. Scholars found that the belief systems of people with diverse educational levels do not differ meaningfully in the U.S. (Boutyline & Vaisey, 2017) and that a country's mean level of education is not reliably associated with the tightness of political beliefs of its inhabitants (Keskintürk, 2022b). Still, it is important to test this path, as it might be the source of a strong alternative mechanism leading to belief constraint. Attitudes could be strongly organized not because of the reception of party cues, but rather because of individual levels of education, which determine the ability of respondents to recognize associations between the survey items they have to fill in. Thus:

*H2: Rival tightness hypothesis*. The belief system of people with high educational levels is tighter than that of people with low educational levels.

Finally, this article investigates an additional source of potential variation in political belief systems, which has always been overlooked in past research. It is common practice for researchers in this field to stratify the sample by sociodemographic characteristics, to observe variations in the belief systems of different population strata (e.g.: Boutyline & Vaisey, 2017; Franetovic & Bertero, 2023; Schlicht-Schmälzle et al., 2018). Effectively, this methodological strategy is equivalent to traditional moderation analysis, where stratificational measures are assumed to mediate the relationships between the selected attitudes (see Method section for details). In so doing, researchers have always excluded vote choice from the set of examined intervening factors. Perhaps, this exclusion is due to the North American focus of scholars in this field. While striking differences are unlikely to emerge in a bipolar party system like the U.S., where issue ownership is quite clearly divided between the red and blue parties, important differences might emerge in multiparty systems. Fitting network models on different electorates gives the possibility to understand whether different voters construe the political competition in different ways and whether they agree on which political issues go together. Thus, the paper examines the three biggest political factions in the 2023 election, to test:

*H3: Consensus hypothesis*. The belief systems of people who voted for the right-wing, left-wing coalition, and 5SM structurally differ.

**3. Method**

### 3.1 Data and variables

Analyses are based on the fifth wave of ResPOnsE data, an Italian dataset endowed with a Rolling Cross-Sectional design (Vezzoni et al., 2020)[[4]](#footnote-4). The sample is obtained with quotas by area of residence, gender, and age group. Wave five was fielded between October 20 to December 15, 2022, through a multipurpose CAWI questionnaire. The other waves of this dataset mostly focus on the pandemic. However, this wave was polled one month after the general elections of September 25, 2022, and thus included numerous variables tapping into symbolic and operational components of the Italian political belief system. ResPOnsE is composed of a core module, filled out by all respondents, and other thematic sections shown to smaller sample partitions where participants are randomly assigned. This work features survey batteries that were supplied to a total of 1850 respondents. List-wise deletion reduced the sample to 1149 respondents[[5]](#footnote-5).

Table 1 (below) reports labels and survey questions for each attitudinal variable featured in the analyses. Descriptives are provided in Table 1 of the Supplement. Variables are measured on different scales, and their polarity is aligned to have high values indicating support for all issues and attachment to parties. Attitudes were considered symbolic when they measured support or attachment to political labels and parties, and operational when they measured endorsement of policy proposals that could be implemented by political parties (Ellis & Stimson, 2012; Free & Cantril, 1968)[[6]](#footnote-6). Symbolic components were surveyed through left-right self-placement and Propensity to Vote [PTV] items and are labeled in capital letters. The first item is the most established assessment of left-right political labels. Another set of variables measures the attachment to the five major Italian parties (FDI, L, and FI; PD; M5S). The PTVs prompt respondents to report their likelihood of voting for a particular party in a generic and future election. These items capture the electoral utility respondents gain by voting for a party. Compared to vote choice, PTVs have the advantage of creating continuous data with high variance (see Table 1, Supplement) on the antecedents of vote choice (van der Eijk et al., 2006).

Consistent with previous research, most of the selected variables are operational issues (Boutyline & Vaisey, 2017; Brandt et al., 2019; Keskintürk, 2022b). Four variables tap into the ethical issues of adoptions by homosexual couples, abortion, euthanasia, and homosexual marriage, as they have all been salient in recent years in the Italian context. The recognition of same-sex couples in Italy was achieved in 2016 with the Cirinnà law, which excluded any reference to adoption by same-sex couples (Di Nicola, 2016). Abortion has been formally permitted in Italy since 1978 (Caldwell, 1981), but the conspicuous number of abstentionist doctors often impedes the practical availability of this right. Finally, the possibility of legalizing euthanasia has recently entered the Italian political arena, as the *political entrepreneur* Marco Cappato politicized the issue by assisting an Italian citizen willing to pursue it in Switzerland (Vergallo, 2019). Four other variables regard economic attitudes: income redistribution, the preferred role of the government (interventionist versus liberal), the desired policies to fight unemployment (subsidizing people versus aiding businesses), and a general evaluation of globalization. These attitudes are expected to be prominent in the political belief system, as inequality is described as the main issue informing left and right self-placement (Bobbio, 1996). I further designed a survey battery measuring attitudes towards the *flat tax*, minimum wage, citizenship income, and immigration since they were respectively the flagship proposals of the right-wing coalition, PD, and 5SM during the 2022 electoral campaign (Bertero & Scaduto, 2023). Lastly, an item examines preferences for the supply of arms to Ukraine, as the Ukrainian war has recently shaken Italian public opinion. In addition to attitudinal items, the analyses require data on individual education, self-reported vote choice, and a four-point scale of political interest. Their frequency distribution is provided in Table 2 of the Supplement.

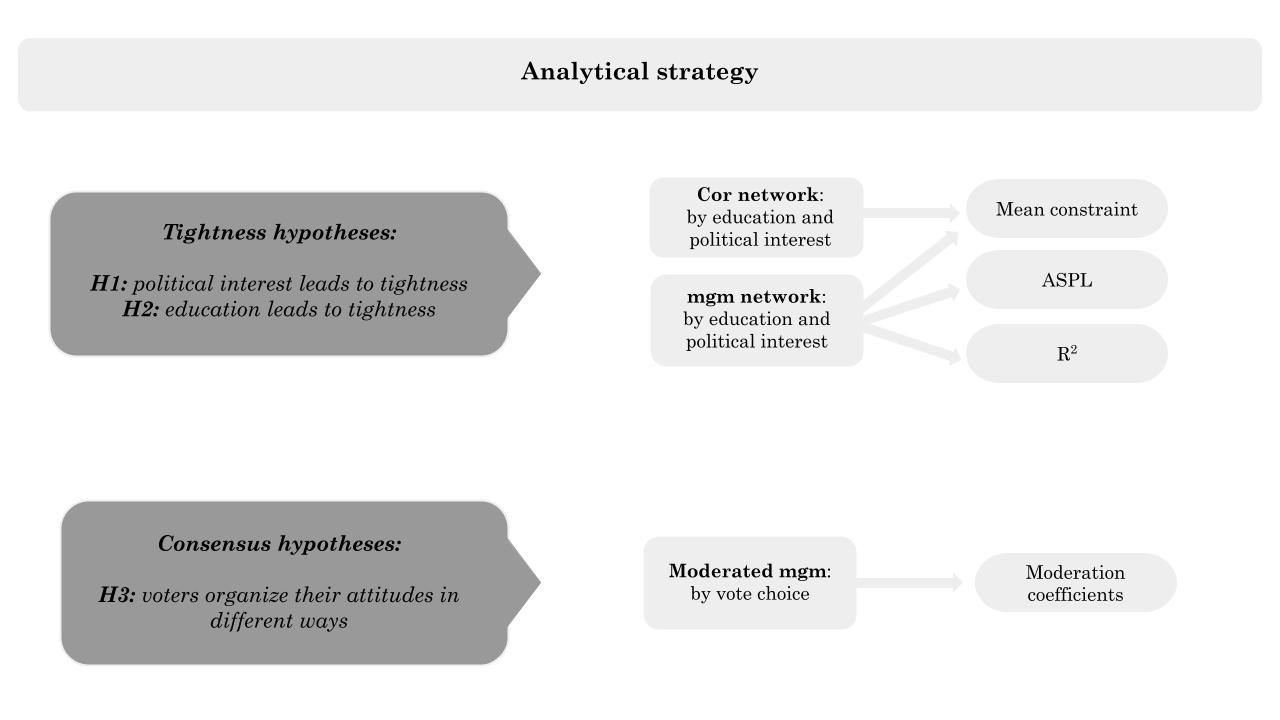
*Table 1: Label and survey questions*

|  |  |  |
| --- | --- | --- |
| **Label** | **Question** | **Scale** |
| L\_R | Many people when talking about politics use the terms "left" and "right." Thinking about your political views, where do you stand? | 0 (Left)  10 (right) |
| PTV\_PD | [Among the various parties we have in Italy, each would like to have your vote in the future. Regardless of how you plan to vote in the next election,] how likely are you to vote for the Partito Democratico in the future? | 0 (Not likely)  10 (Very likely) |
| PTV\_FI | [...] how likely are you to vote for Forza Italia in the future? | 0 (Not likely)  10 (Very likely) |
| PTV\_L | [...] how likely are you to vote for Lega in the future? | 0 (Not likely)  10 (Very likely) |
| PTV\_M5S | [...] how likely are you to vote for the 5 Stars Movement in the future? | 0 (Not likely)  10 (Very likely) |
| PTV\_FDI | [...] how likely are you to vote for Fratelli d’Italia in the future? | 0 (Not likely)  10 (Very likely) |
| adopt | [On political issues people have different opinions. What is your level of agreement with the following statements? Do you strongly agree, somewhat agree, slightly agree, or strongly disagree?] Gay and lesbian couples should have the same right to adopt a child as heterosexual couples | 1 (Disagree)  4 (Agree) |
| abort\* | [...] Abortion must be made more difficult | 1 (Disagree)  4 (Agree) |
| eutha | [...] Euthanasia should be legal | 1 (Disagree)  4 (Agree) |
| marria | [...] Legalization of same-sex marriage is a good thing | 1 (Disagree)  4 (Agree) |
| redis | [Now we would like to know your opinion on some political issues. For each of the following statements, indicate your position on a scale ranging from 1=completely disagree, to 6=completely agree. If your opinion is roughly in the middle between the two, you may choose any other point on the scale.] It is necessary to reduce income differences between those with high incomes and those with low incomes. | 1 (Disagree)  6 (Agree) |
| flat\_t | [...] It is necessary to introduce a flat tax (fixed tax rate, regardless of income). | 1 (Disagree)  6 (Agree) |
| m\_wage | [...] A minimum hourly wage must be introduced by law. | 1 (Disagree)  6 (Agree) |
| cit\_in | [...] It is necessary to maintain a guaranteed citizenship income for those below the poverty line. | 1 (Disagree)  6 (Agree) |
| globa\* | [...] It is necessary to limit economic globalization. | 1 (Disagree)  6 (Agree) |
| immig | [...] It is necessary to give citizenship more easily to the children of legal immigrants born and raised in Italy. | 1 (Disagree)  6 (Agree) |
| big\_go | Some say taxes should be reduced even at the cost of reducing public services. Others say services should be expanded even at the cost of raising taxes. Where would you place your opinion on a scale of 1 to 7? | 1 (Lower taxes)  7 (Extend ublic services) |
| pub\_pri\* | Resources to counter the negative effects of unemployment are limited. In such a situation, do you think it is more effective to give subsidies to people in economic hardship or to help businesses that hire? Please indicate where you would place your opinion on a scale of 1 to 7. | 1 (people)  7 (businesses) |
| ukrai\* | Thinking about the war in Ukraine, do you favor or oppose supplying arms to Ukraine | 1 (Favor)  4 (Oppose) |

*Caption:* Survey variables and labels. The polarity of items marked with an asterisk was inverted. High scores indicate support for an issue or attachment to a label. Squared brackets replace prompts common to multiple questions.

### 3.2 Analytical strategy

The analytical strategy is divided into network estimation (detailed in Section 3.3) and hypothesis testing (Section 3.4). Figure 1 (below) summarizes these steps. I fit three kinds of network models. First, I estimate plain correlational networks on the subsamples of individuals with low and high levels of political interest and education. Second, I fit four mixed graphical models on the same subsamples. Finally, I adopt moderated network models to investigate the impact of vote-choice using moderation analyses rather than stratificational approaches.

*Figure 1: Analytical strategy*

### 3.3 Network models

All network models adopted in this article render survey variables as nodes of a weighted network. The main difference between these models is edge estimation.

**Correlational networks.** To cumulate with past research adopting a network approach in social sciences, I begin with the estimation of correlational networks (Boutyline & Vaisey, 2017; DellaPosta, 2020; Keskintürk, 2022b, 2022a). I stratify by low (911 individuals) and high levels (238) of political interest and education, performing median splits for political interest (see Table 1, Supplement), and distinguishing between people without (706) and with university degrees (443). Next, I compute zero-order correlation coefficients[[7]](#footnote-7) for each pair of political attitudes, in each of the four subsamples. Counter to the majority of work adopting BNA (Boutyline & Vaisey, 2017; Keskintürk, 2022b, 2022a), but in line with more recent contributions adopting a network approach in political science (DellaPosta, 2020), network edges are equal to the absolute correlation coefficients. The rival approach involves squared coefficients. This artificially reduces the magnitude of originally negative edges, biasing the estimation of mean constraint (see Section 3.4).

**Mixed Graphical Model.** Next, I estimate two classes of Pairwise Markov Random Field models [PMRFs]. Similarly to correlational networks, PMRFs output weighted networks. However, these models produce signed edges and encode conditional independences as absent edges in the network plot (Lauritzen, 1996). Unlike correlational networks, PMRF produces sparse graphs. This has the advantage of closing the gap between the network theory of belief system —which posits causality between political beliefs— and their empirical examination in political science —which is currently anchored to plain correlational approaches. Testing H1 and H2 requires node-wise and aggregated estimates or R2. Hence, I adopt a mixed graphical model in which all variables are considered quasi-continuous ([mgm]; Epskamp, Waldorp, et al., 2018). This model involves a loop of node-wise regularized regressions. The resulting regression coefficients are plotted as network edges. The regularization technique of choice is a variant of the least absolute shrinkage and selection operator called graphical LASSO (Tibshirani, 1996). The appropriate level of the tuning parameter of the regularization procedure is found by minimizing the Extended Bayesian Information Criteria (Chen & Chen, 2008). By treating all variables as quasi-continuous, the mgm reduces to a Gaussian Graphical Model ([GGM] Epskamp, Waldorp, et al., 2018; Haslbeck & Waldorp, 2020), whose edges are interpretable as signed, regularized partial correlations (Burger et al., 2023). In this way, this research cumulates on the most recent work on belief systems in political psychology (Brandt et al., 2019; Brandt & Sleegers, 2021). I fit four mgm models, on the same sample partitions on which I estimate the correlational networks.

**Moderated Network Model.** Estimating mgm models on the four sample partitions equals traditional moderation analyses, where researchers observe variations of pair-wise statistical associations at varying levels of a third intervening variable. However, this modeling strategy reduces statistical power by fitting separate models on smaller sample sizes. I thus use a second variant of the mgm, which estimates a moderated network model (mnm) (Haslbeck, 2022). This consists of a GGM in which each pairwise interaction is modified to include a possible moderation effect of an external variable. Significant moderators are again isolated through the combination of the graphical Lasso and EBIC. I fit the mnm on the full sample, specifying self-reported vote choice (left-wing, right-wing coalition, and M5S) as the moderator. I adopt the mnm because it attenuates the Berkson bias (Westreich, 2012). When stratifying the sample by the sociodemographic variables, I obtain subsamples where the variance of political attitudes is preserved. Yet, the vote-choice stratification would restrict their variance, violating the assumptions of the resulting network models (De Ron et al., 2021).

### 3.4 Hypothesis testing

In this Section, I detail the hypothesis testing phase. I test H1 and H2 with correlational and mgm networks fitted on the sample partitions of political interest and education. Then, I test H3 using the moderator network model. In the remainder of the Section, I detail and motivate the strategies with which I test the main proposition of the belief system theory.

**Mean constraint.** In social sciences, mean constraint is the most widely adopted measure of the tightness of a belief system (Boutyline & Vaisey, 2017; Keskintürk, 2022a, 2022b). This measure is equal to the average value of network edges. The works adopting BNA estimate network edges by squaring zero-order correlation coefficients. However, this unfairly penalizes the negative correlations, which become smaller by design. Hence, I follow DellaPosta’s approach (2020), adopting absolute correlation coefficients as a modeling strategy. I then operationalize the mean constraint in the usual fashion by calculating the average values of edges in the networks. To perform a direct comparison between correlational networks and mgms, I further adapt the measure for the mgms. Their mean constraint is calculated by averaging the mean absolute value of non-zero edges. This allows for an unbiased test of H1 and H2 on both model types. To allow for statistical testing of H1 and H2, I perform nonparametric bootstrap (Efron, 1979). Starting from the four sample partitions, I perform ten thousand bootstrap iterations by resampling with replacement, creating forty thousand bootstrapped samples in total. Re-estimating the correlational and mgm networks on the bootstrapped samples yields four bootstrapped distributions of mean constraint. I then build 95% bootstrapped CIs by considering the central 95% of the distributions (Epskamp, Borsboom, et al., 2018). By comparing the mean constraint of correlational and mgm networks, I aim to understand whether political interest and education increase respectively the raw or unique variances shared between Italian political attitudes.

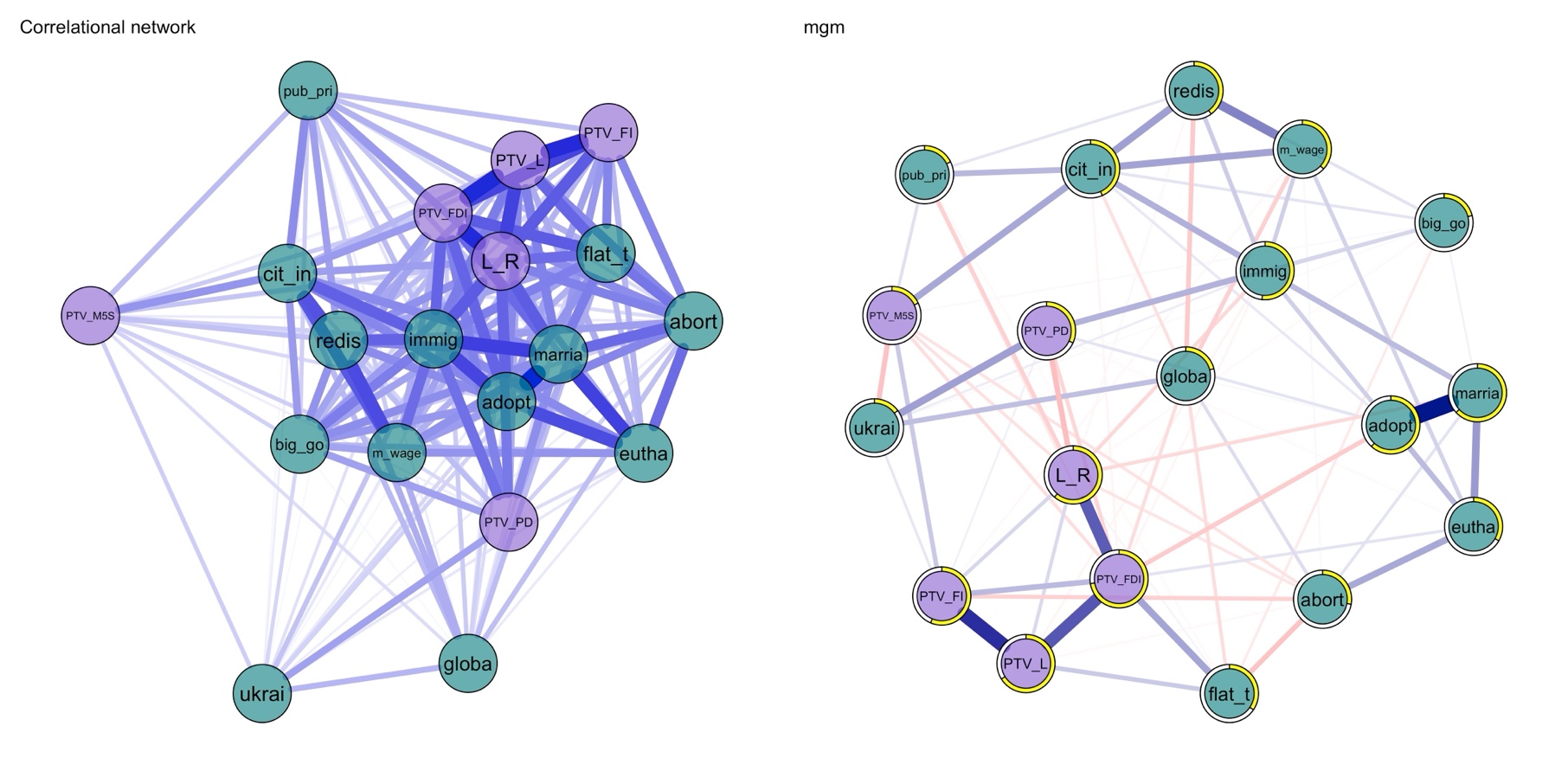
**ASPL.** The mean constraint is similar to a global measure of connectivity in that it detaches edges from their positions in the network. High values of constraint imply that the belief system has high mean values of network edges. However, two networks may have identical values of constraint, but drastically different configurations, such as when one score is due to homogeneous edge weight in the model, and the other is due to a bimodal distribution of edge weights. In extreme cases, this can lead to marked differences between their connectivities. To account for this, I perform an additional test of H1 and H2 by calculating the ASPL of the stratified mgm networks. This measure is obtained by averaging the shortest paths between all network nodes, weighted by the absolute magnitude of their connections (Opsahl et al., 2010). High ASPL values indicate a network is sparser. Just like for the mean constraint test, I evaluate H1 and H2 by comparing the bootstrapped distribution of ASPL of the high versus low groups.

**R2.** The decomposition of constraint into tightness and consensus allows for an additional test regarding the organization of the Italian political belief system. When belief systems are tighter, political attitudes should be more embedded in the network, thus more predictive of each other. To test for this, I calculate node-wise R2 on the mgm networks (Haslbeck & Waldorp, 2018). This metric is calculated and interpretable like in standard regression analysis, as the edges of an mgm result from regularized OLS. I compare two statistics. First, I investigate whether the R2 of each network node in the mgm is greater in the high subsamples than in the low ones. This allows me to appreciate node-wise differences in explained variance to verify if the eventual increase is due to a minority of nodes or if it is evenly distributed. Second, I calculate the bootstrapped distribution of the mean node-wise R2. This allows for a more rigorous statistical test of H1 and H2.

**Moderation coefficients.** Testing H3 requires a comparison of the belief systems of different electorates. The stratification of the sample is not a viable option, as it would result in partitions in which political attitudes have low variance. Hence, I adopt the moderated network model detailed in Section 3.3. Within this framework, I can directly test H3 by examining the edges of the model that are significantly moderated by self-reported vote choice.

## 4. Results

Before testing the research hypotheses, I report on the drastic differences between correlational and mgm networks. Figure 2 (below) shows the results of a full sample estimation of a correlational network (left) and a mgm (right panel). Nodes represent the political attitudes and are labeled according to Table 1. Edge interpretation varies according to the model (Burger et al., 2023). Edges of the correlational network represent squared zero-order correlation coefficients. The signed ties of the mgm represent node-wise and regularized regression coefficients on a -1 to +1 scale. However, since I modeled all attitudes as quasi-continuous, these signed edges can be interpreted as regularized partial correlation coefficients (Haslbeck & Waldorp, 2020). Red edges represent negative associations, blue positive ones. The nodes are color-coded based on their classification into symbolic and operational categories, while their spatial arrangement is determined using the Fruchterman Reingold force-directed algorithm (Fruchterman & Reingold, 1991). The two network models differ importantly. First, the 19 political beliefs can generate a maximum of 171 associations[[8]](#footnote-8). The correlational network is a fully connected graph with only 4 edges lower than 0.001; many edges are not visible in Figure 2 due to the scaling of edges. The mgm is a sparse network featuring 94 null associations. These conditional independencies are encoded as absent edges in the right panel of Figure 2. As a second point, although being on the same scale, regularization shrinks mgm’s edges to substantially smaller values. Correlation coefficients range from nearly zero (fourteen associations) to 0.841 (for the association[[9]](#footnote-9) wmarria-adopt). Regularized partial correlations range between -0.132 (wPTV\_M5S-ukrai) to 0.521 (wmarria-adopt). As a consequence, the two networks show different levels of tightness. The mean constraint of the correlational network is 0.323, and that of the mgm is only 0.101. Despite these differences, the networks show important similarities. Symbolic components are particularly embedded in both networks, as PTV items and left-right self-placement tend to correlate strongly. The only exception to this pattern is the node *PTV\_M5S,* which clusters away from the other propensity to vote. Finally, the two models converge in signaling the low centrality of the attitudes *ukrai* and *globa*. In sum, the estimation technique impacts the resulting networks, as the mgm shows a smaller number of connections and lower mean constraint.

*Figure 2: Network of political attitudes of the full sample*

*Caption:* Correlational (left) and mgm network (right) of the Italian political belief system. Nodes are colored according to variable type (symbolic or operational). The yellow borders of the nodes indicate R2 values. Edges indicate absolute correlations (left) and regularized partial correlations (right). The former are signed (red = negative associations). Node labels: *L\_R* = Left right self-placement; *PTV\_PD* = Propensity to vote for PD; *PTV\_FI* = Propensity to vote for Forza Italia; *PTV\_L* = Propensity to vote for the Lega; *PTV\_M5S* = Propensity to vote for M5S; *PTV\_FDI* = Propensity to vote for Fratelli d’Italia; *adopt* = Stepchild adoption; *abort* = Abortion; *eutha* = Euthanasia; *marria* = Homosexual marriage; *redis* = Redistribution; *flat\_t =* Flat tax; *m\_wage* = Minimum wage; *cit\_in* = Citizenship income; *globa =* Globalization; *immig* = Immigration; *big\_go* = Big government;  *pub\_pri =* Public vs private; *ukrai* = Weapons to Ukraine.

The top and bottom panels of Figure 3 (below) report the results for H1 and H2, respectively. Each panel has two series of violin plots, one for the correlational (violet) and one for the mgm networks (green shapes). Each violin is composed of ten-thousand-point estimates of mean constraint (plotted on the y-axis). These estimates are obtained after the stratification of the original sample in high versus low levels and by bootstrapping the results of network estimation. The four correlational networks (one for each category of political interest and education) and the four mgm networks are visualized in Figures 1 and 2 of the Supplement. Bootstrapped CIs encapsulate the central 95% of the distribution. In line with H1, political interest and mean constraint are positively and significantly associated. The top left panel of the figure shows that the belief system of people with high political interest is significantly tighter than those of people with lower interest (high grpup: bootstrapped μ = 0.328; bootstrapped CI: 0.295 - 0.361. Low group: μ = 0.281; bootstrapped CI: 0.263 - 0.294). The results replicate on mgm bootstrapped data (High group: bootstrapped μ = 0.105; bootstrapped CI: 0.097 - 0.115. Low group: μ = 0.088; bootstrapped CI: 0.082 - 0.094). As observed while commenting on Figure 1, the adoption of regularization shrinks the estimated values of mgm constraint to smaller values. Additional analyses show that the relationship between constraint and political interest is especially stable for correlational networks. Figure 3 of the Supplement replicates the violin plots with different operationalizations of political interest. For correlational data, the belief systems of people with low education (μ = 0.233; bootstrapped CI: 0.221 - 0.256) is significantly less tight than those of people with medium (μ = 0.302; CI: 0.282 - 0.323) and high (μ = 0.33; CI: 0.29 - 0.36) interest. Furthermore, results hold even if splitting political interest at the middle point of the scale (Low group: μ = 0.233; CI: 0.212 - 0.255. High group: μ = 0.311; CI: 0.294 - 0.328). The results of mgm networks do not overcome these additional tests. Finally, Figure 3 shows that H2 is rejected, as overlapping CIs indicate that education and mean constraint are not significantly associated. Additional analyses reveal that the impact of education is not significant even if adopting other coding strategies.

*A diagram of different colored shapes

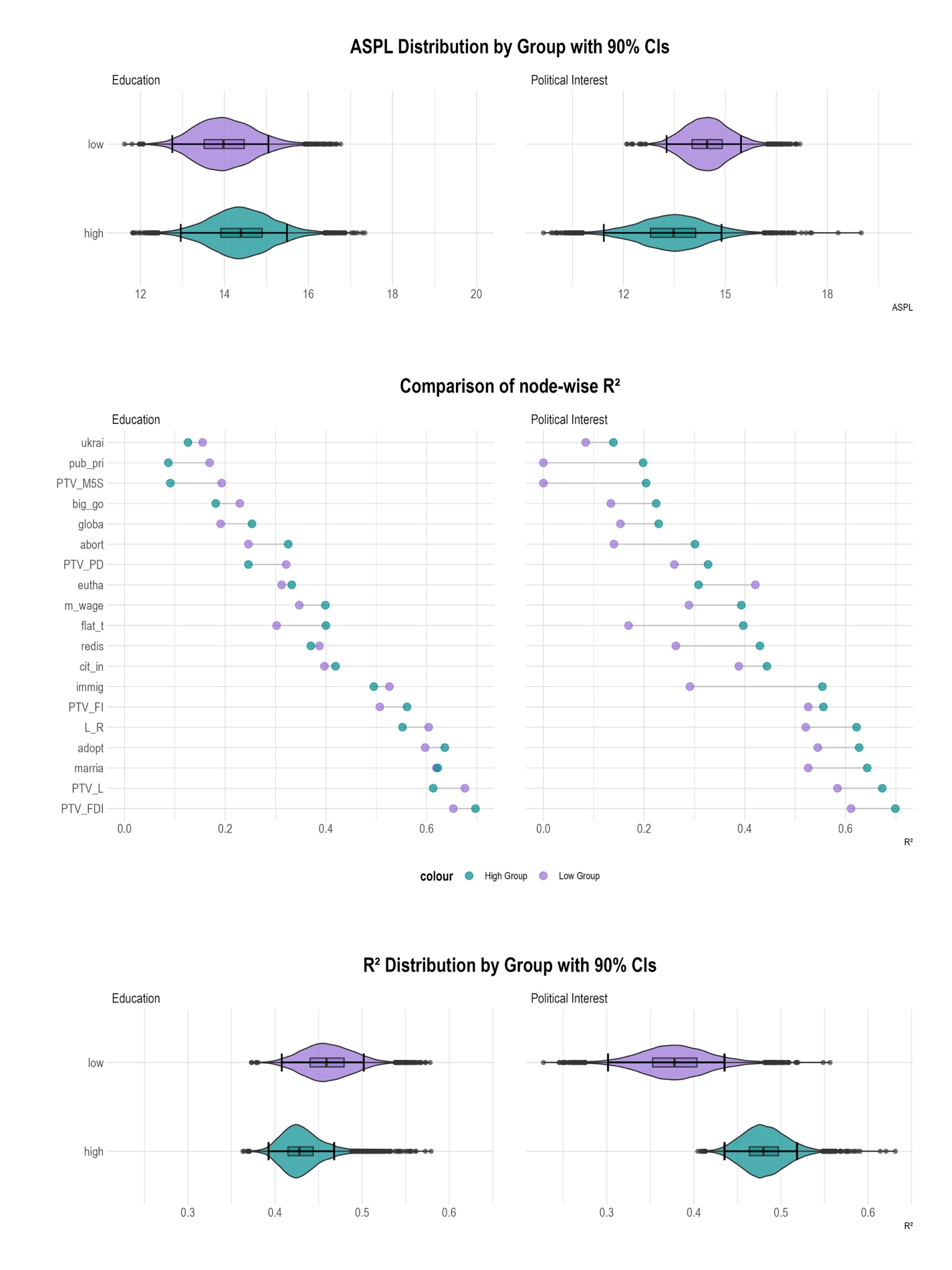
Description automatically generated with medium confidenceFigure 3: Beliefs’ constraint by levels of political interest and education*

*Caption:* Bootstrapped distributions of belief constraints across different levels of political interest (top) and education (bottom panel). Violet violins show results obtained with correlational network estimation, green refers to mgm networks. Black bars show bootstrapped confidence intervals (95%). Political interest is positively correlated with mean constraint, regardless of network estimation type. Education and mean constraint are not linearly related.

Mean constraint is one of the possible operationalizations of the tightness of a belief system. Stronger connections between political attitudes should produce differences in the connectivity of the network, in the proportion of node-wise explained variance, and in the mean predictability of network nodes in the model. I thus test for these different declinations of H1 and H2 in Figure 4 (below). The top panel of the figure shows the bootstrapped distributions of the ASPL of mgm networks (x-axis) estimated on the high (green violin) versus low (purple) education and political interest samples (y-axis). The whiskers of the box plots within each violin are adapted to display 90% bootstrapped CIs, whereas the borders of the boxplot canonically represent the first and third quartiles. H1 and H2 would predict *lower* values for the high groups, as ASPL is a measure of distance. Yet, CIs always overlap, even if calculated at the 90% level. Moreover, the means of the bootstrapped distributions of political interest are at least in line with H1 (Low political interest: μ = 14.481; CI: 13.271 – 15.852. High: μ = 13.458; CI: 11.423 – 15.419), whereas the ones of education are in the reverse direction (Low education: μ = 14.012; CI: 12.761– 15.440. High: μ = 14.407; CI: 12.962– 15. 918).

The central panel of Figure 4 offers a comparison of node-wise R2. Table 3 in the Supplement presents the precise values behind the lollipop plot. If the belief systems of the high groups are tighter than those of the low groups, the R2 values of the former should be higher. In line with H1 and against H2, this pattern systematically occurs for political interest, but not for education. Indeed, the node-wise R2 of the attitudes of the education networks are not clearly aligned with higher values for the high gropup. As a consequence, the average node-wise difference between R2 is -0.002, indicating that the attitudes of the lowly educated Italians are even *less* embedded in the belief system. The strongest gap between these values regards *flat\_t* and is equal to 0.100 (Low group: R2 = 0.300. High: R2 = 0.400). In the networks estimated on the partitions of political intrest, all node-wise R2 values of the highly interested are greater than those of the lowly interested in politics. The only exception to this pattern is the node *eutha.* As a consequence, the average node-wise gap in R2 is 0.108. This means political attitudes are on average 10% more predictive of each other in the high group compared to the low group. The biggest changes in R2 regard the nodes *immig* (Low group: R2 = 0.290. High: R2 = 0.550. Δ = 0.260) and *flat\_t* (Low group: R2 = 0.170. High: R2 = 0.400. Δ = 0.230).

The lollipop plot highlights differences in point-estimate values of node-wise R2. To complement this finding, I bootstrap the R2 of the mgm models. This results in the bottom panel of Figure 4, which investigates the distributions of the average node-wise R2 (x-axis) across variable type (education, political interest) and level (y-axis). Similar to the top panel, boxplots are modified to plot 90% bootstrapped CIs. The distributions regarding education drastically overlap (Low education: μ = 0.460; CI: 0.408– 0.517. High: μ = 0.431; CI: 0.392– 0.489). The relationship between political interest and mean node predictability is only significant at the fourth decimal, and at the 90% level (Low: μ = 0. .378; CI: 0.301– 0.435*2*. High: μ = 0.431; CI: 0.435*1*– 0.489). However, the medians of the two distributions are well differentiated and in line with H1 (Low: x͂ = 0.378; High: x͂ = 0.464). Moreover, this panel highlights an interesting finding regarding the stability of these estimates. Despite having similair —and substantially low— SD, the bootstrapped distribution of the mean R2 has outliers on both sides of the violin, whereas the high group only skews to the right (Low: SD = 0.039. High: SD = 0.025). Finally, it is important to remark on the interplays of the results of the central and bottom panels of Figure 4. The central panel plots differences in the point-estimates values of node-wise R2. Here, the unit of analysis is the node-wise gap in explained variance, and results show that there is substantial variation in the entity of these differences. The bottom panel tests the R2 operationalization of the tightness hypothesis at the aggregate level. This means that the unit of analysis is the mean R2 of all nodes. The marginal significance of the test presented in the bottom panel can thus be interpreted as (i) a signal of considerable variation of node-wise R2 gaps —in line with the node-wise test— or, (ii) as a signal of high instability of the network estimation in the lowly informed subsample.

*Figure 4: Tests of H1 and H2*

Caption: Top: bootstrapped distributions of the ASPL of mgm networks. Center: node-wise differences in the R2 of the nodes of mgm networks. Bottom: bootstrapped distributions of the mean R2 in mgm networks. Each panel is faceted by education and political interest, with green (purple) violins/dots indicating high (low) gropus.

Finally, I evaluate whether voters of different political coalitions possess heterogeneous belief systems. Figure 5 (below) shows the results of the moderated network model where self-reported vote choice (Left, M5S, or right-wing coalition) is specified as the moderating variable. Each panel of the figure is obtained by conditioning all pairwise associations by different levels of the moderator. Similarly to Figure 1, the edges of the plot represent conditional dependences, and absent edges mean two attitudes are independent if controlling for the rest of other nodes. Unlike in the previous plot, I added the yellow node *vote\_cat*, which signals vote choice was specified as the moderator. It is important to remark that the three panels represent the prediction of the same moderated network model, for different levels of vote choice. Node layout is standardized to ease the comparison of edge strength, and edges are plotted with reduced width to facilitate the detection of the moderation effect —which occurs when a given edge is estimated with a different magnitude in the three panels.

The three belief systems considerably differ. Out of 171 possible edges in the model, fourteen edges are significantly moderated by self-reported vote choice between the belief systems of the left and of the 5SM; eleven edges differ between the belief systems of the left and of the right; twenty-three pairwise associations significantly differ when comparing the network of the right-wing voters and of the M5S. Thus, left and right-wing voters show the highest similarity, the belief systems of the rightist voters and those of the supporters of the M5S differ the least, and the networks of the left and of the M5S are in the middle position. This comparison provides information on the sheer number of identical —that is, un-moderated— edges in the network models. To gain a deeper understanding of the patterns of moderation, I contrast the three belief systems specifying the edges that differ the most.

When comparing leftist and rightist belief systems, the most important differences regard the associations between symbolic components of the network. According to the leftist, high intentions to vote for the M5S are detached from favorable vote intentions for the left-wing coalition (wPTV\_M5S-PTV\_PD = 0.000). Yet, right-wing voters perceive that voting for these two political factions is likely to satisfy the same electoral utilities (wPTV\_M5S-PTV\_PD = 0.473). The same pattern occurs when considering the propensity to vote for FDI and PD. In the belief systems of the left, these two items are conditionally independent (wPTV\_FDI-PTV\_PD = 0.000); in the belief system of the right, this association is significant and negative (wPTV\_FDI-PTV\_PD = -0.120).

Also the belief systems of the supporters of M5S and the left-wing coalition differ concerning the associations between symbolic attitudes. For example, the propensity to vote for PD and FI are uncorrelated in the network of the left (wPTV\_FI-PTV\_PD = 0.000), and positively correlated for the voters of the movement (wPTV\_FI-PTV\_PD = 0.690). Moreover, these belief systems also differ in how symbolic and operational attitudes are packed together. For example, M5S supporters perceive a stronger association between a high propensity to vote for their political faction and supporting their flagship proposal, the citizenship income (wPTV\_M5S-cit\_in = 0.052 for the left; 0.150 for the M5S). Also, left-wing voters do not perceive an association between a preference for giving subsidies to people in economic hardship rather than to private companies and the propensity to vote for their party (wPTV\_PD-pub\_pri = 0.000). Instead, the supporters of the movement think that voting for the PD relates to the desire to subsidize companies over citizens (wPTV\_PD-pub\_pri = -0.174).

When comparing the belief systems of the voters of the right-wing coalition with those of M5S voters, I retrieve important differences regarding associations between symbolic components, and between symbolic and operational ones. As in the previous comparison, these voters conceptualize the space of the political competition in different ways. The most striking difference regards the associations between the propensity to vote for the movement and the PD (wPTV\_PD-PTV\_M5S = 0.000 for the supporter of the movement; 0.473 in the belief system of the right). Moreover, these electorates pack together symbolic and operational components differently. For example, the supporters of the movement, unlike those of the right-wing coalition, believe that being in favor of the flat tax implies the approval of sending weapons to Ukraine (wflat\_t-ukrai = 0.084).

ADD FEW LINES FROM DRIVE WHERE YOU COMMENT ON FIG 5 OF SUPPLEMENT

A diagram of a network

Description automatically generated with medium confidence*Figure 5: moderated network model, by self-reported vote choice*

Node labels: *L\_R* = Left right self-placement; *PTV\_PD* = Propensity to vote for PD; *PTV\_FI* = Propensity to vote for Forza Italia; *PTV\_L* = Propensity to vote for the Lega; *PTV\_M5S* = Propensity to vote for M5S; *PTV\_FDI* = Propensity to vote for Fratelli d’Italia; *adopt* = Stepchild adoption; *abort* = Abortion; *eutha* = Euthanasia; *marria* = Homosexual marriage; *redis* = Redistribution; *flat\_t =* Flat tax; *m\_wage* = Minimum wage; *cit\_in* = Citizenship income; *globa =* Globalization; *immig* = Immigration; *big\_go* = Big government;  *pub\_pri =* Public vs private; *ukrai* = Weapons to Ukraine.

## 5. Discussion and conclusions

This research focused on the relationships between Italian political beliefs adopting a network approach. First, the article investigated the attitude network of people with different levels of political interest and education. Correlational networks show that the beliefs of the most interested in politics are more constrained than those of the lay public. This provides support to H1. Conversely, H2 was rejected, as the attitude network of the most educated was not more organized than that of the low-education sample. To further understand the inner structure of the Italian political belief systems, the sample was stratified by self-reported vote choice at the general election of 2022 and regularized partial correlation networks were fitted on each partition. The GGMs excel in parsimony and examine the signs of the associations between political attitudes, being suitable to evaluate structural differences between the belief systems of the voters of the right-wing coalition, the PD, and the 5SM. H3 was confirmed, as the partial correlation networks markedly differ. The first difference regards the number of the detected associations. 85, 72, and 64 edges composed the networks of the left, M5S, and rightist supporters respectively. In a GGM, two variables are tied if conditionally dependent. Therefore, this first difference implies that the political attitudes of the voters of the PD are more predictive of each other if compared to those of the other electorates. Second, 52 edges significantly differed between the belief systems of the right and the 5SM, 42 between the left and the right, and 38 between the left and the 5SM. This means that vote choice is a strong mediator of infra-attitudinal relationships, and that the belief systems of the supporters of PD and M5S are quite similar while being very different from the rightist one. Indeed, the GGMs of the left and the Movement mostly differ in the relationships between operational components, as M5S’s voters perceive stronger associations between support for citizenship income, redistribution, and minimum wage. Right-wing and left-wing voters structure both their symbolic and operational beliefs in different ways. The leftists struggle to distinguish between FDI, L, and FI, whereas the rightists tend to think that voting for the PD is similar to voting for the 5SM; moreover, leftists believe that support for immigrants goes hand in hand with support for the minimum wage and that supporting the flat tax implies being against the ease of abortion, unlike voters of the rightist parties, who do not perceive these associations. Finally, the belief systems of the right and the M5S differ along three lines. Their symbolic beliefs are organized in opposite ways, as supporters of the Movement tend to perceive the rightist parties as similar entities, and their supporters think in turn PD and M5S are similar forces. Their operational beliefs also differ, especially regarding the associations between citizenship income, minimum wage, immigration, and support to Ukraine. Finally, these electorates pack operational and symbolic components differently. M5S’s voters think that their vote choice is highly associated with the approval of citizenship income, and that being rightist means being in favor of sending weapons to Ukraine, and against migrants. Conversely, rightist supporters think supporting the M5S is unrelated to the approval of citizenship income, and that supporting Ukraine is unrelated to the migrant issue.

Thus, voters of the left and the M5S tend to disagree on which political attitudes go together but similarly construe the political competition. Therefore, their belief systems are the most similar ones. The rightist and leftist voters conceptualize the political arena in different ways and organize their policy preferences with different logic. The belief systems of the supporters of the right-wing coalition and M5S are the ones differing the most, as their voters not only organize their symbolic and operational beliefs in different ways but also show different patterns of associations between symbolic and operational components.

Another element that is worth discussing is the apport provided by the new class of network methods employed in this paper. Already in the sixties, Converse underlined that “Belief systems have never surrendered easily to empirical study or quantification” (Converse, 2006, p. 1). Despite a growing number of scholars examining this topic, belief systems have remained challenging objects of inquiry. Converse’s works constitute the first wave of these studies and represent a theoretical milestone for this area. The second wave started with a methodological innovation, that of the Belief Network Analysis (Boutyline & Vaisey, 2017). These works tested the social constraint account more formally and reduced the mismatch between a networked theory of belief systems and their rudimental and bivariate investigation. The advent of the third wave was prompted by the advancements in network psychometrics, allowing political scientists and political psychologists to focus on the backbone of the correlational structure of political attitudes (Brandt & Sleegers, 2021). This article reconfirms that partial correlation networks can be fruitfully applied to political attitudes, as their parsimony and their capability of modeling signed edges are unmatched by plain correlational models and are essential for an examination of the heterogeneity of belief systems at the population level.

This article provided two main contributions to the literature on political belief systems. First, this research constitutes the first examination of Converse’s theory of social constraint in Italy. Political attitudes of the more politically interested are confirmed to be more constrained than those of the lay public, whereas the alternative mechanism pointing at the role of education failed to find empirical support. Second, this article bridged between plain correlational models and partial correlational ones to investigate an unjustly neglected source of belief systems’ heterogeneity. Results show that if stratificational variables -like political interest- impact the amount of organization of these networks of attitudes, behavioral ones -like vote choice- produce important differences in the way political beliefs relate to each other and determine differential conceptualization of the political arena.

This article has three important limitations. First, the analyses would have benefited from a more representative sample. Secondly, Converse’s theory was only tested through a proxy variable. Indeed, his account insisted on the organizing role of political knowledge, whereas here the sample was stratified by political interest, due to data shortage. Finally, it is necessary to reflect on the general interpretation of the network models in this article. When applied to cross-sectional data, these models represent an average of the belief system of a target population. Therefore, the analytical strategy of this paper provided limited insight into within-person belief systems (Brandt & Morgan, 2022). On the one hand, this represents a crucial drawback of these methodologies, as belief systems are conceptualized as individual attributes, but mostly measured at the aggregate level (Brandt, 2022). On the other hand, this strategy leans toward the classical research questions faced by political scientists, as these models are best interpretable as a typification of the political cleavages riddling a society, rather than a concrete structure found inside the mind of a person (Brandt & Sleegers, 2021; Martin, 2000).

Future research might work on these limitations to usher in a wished fourth phase of studies on belief systems. Be it through individual network models or experimental research designs, this field of study is called to address the prominent questions regarding the nature of the relationships between political beliefs, establishing where and when they are causal. Moreover, it would be important to investigate how vote choice produces heterogeneous belief systems comparatively, as the findings of the present research could not generalize to other party systems.

## 6. References

Benedetta, C., & Vincenzo, M. (2020). Do environmental preferences in wealthy nations persist in times of crisis? The European environmental attitudes (2008-2017). *Italian Political Science Review/Rivista Italiana Di Scienza Politica*, *50*(1), 1–16. https://doi.org/10.1017/ipo.2019.3

Bertero, A., & Scaduto, G. (2023). A midsummer’s night dream: Political communication during the Italian 2022 electoral campaign. *Italian Journal of Electoral Studies QOE-IJES*. https://doi.org/10.36253/qoe-14224

Bobbio, N. (1996). *Left and right: The significance of a political distinction*. University of Chicago Press.

Boutyline, A., & Vaisey, S. (2017). Belief Network Analysis: A Relational Approach to Understanding the Structure of Attitudes. *American Journal of Sociology*, *122*(5), 1371–1447. https://doi.org/10.1086/691274

Brandt, M. J. (2022). Measuring the Belief System of a Person. *Journal of Personality and Social Psychology*, *123*(4), 830–853. https://doi.org/10.1037/pspp0000416

Brandt, M. J., & Morgan, G. S. (2022). Between-Person Methods Provide Limited Insight About Within-Person Belief Systems. *Journal of Personality and Social Psychology*, *123*(3), 621–635. https://doi.org/10.1037/pspp0000404

Brandt, M. J., Sibley, C. G., & Osborne, D. (2019). What Is Central to Political Belief System Networks? *Personality and Social Psychology Bulletin*, *45*(9), 1352–1364. https://doi.org/10.1177/0146167218824354

Brandt, M. J., & Sleegers, W. W. A. (2021). Evaluating Belief System Networks as a Theory of Political Belief System Dynamics. *Personality and Social Psychology Review*, *25*(2), 159–185. https://doi.org/10.1177/1088868321993751

Burger, J., Isvoranu, A.-M., Lunansky, G., Haslbeck, J. M. B., Epskamp, S., Hoekstra, R. H. A., Fried, E. I., Borsboom, D., & Blanken, T. F. (2023). Reporting standards for psychological network analyses in cross-sectional data. *Psychological Methods*, *28*(4), 806–824. https://doi.org/10.1037/met0000471

Caldwell, L. (1981). Abortion in Italy. *Feminist Review*, *7*(1), 49–63. https://doi.org/10.1057/fr.1981.4

Chen, J., & Chen, Z. (2008). Extended Bayesian information criteria for model selection with large model spaces. *Biometrika*, *95*(3), 759–771. https://doi.org/10.1093/biomet/asn034

Cicco, G. D., Renzib, A., Marianib, R., Negric, A., Tranib, M. D., & Lauriola, M. (2023). Between populism and egalitarianism: Mapping attitudes toward social and political issues during the Draghi government using exploratory graph analysis. *Psychology Hub*. https://doi.org/10.13133/2724-2943/17982

Cohen, G. L. (2003). Party Over Policy: The Dominating Impact of Group Influence on Political Beliefs. *Journal of Personality and Social Psychology*, *85*(5), 808–822. https://doi.org/10.1037/0022-3514.85.5.808

Conti, N., & Memoli, V. (2015). Show the money first! Recent public attitudes towards the EU in Italy. *Italian Political Science Review/Rivista Italiana Di Scienza Politica*, *45*(2), 203–222. https://doi.org/10.1017/ipo.2015.11

Converse, P. E. (2006). The nature of belief systems in mass publics (1964). *Critical Review*, *18*(1–3), 1–74. https://doi.org/10.1080/08913810608443650

Coppock, A., & Green, D. P. (2022). Do Belief Systems Exhibit Dynamic Constraint? *The Journal of Politics*, *84*(2), 725–738. https://doi.org/10.1086/716294

De Ron, J., Fried, E. I., & Epskamp, S. (2021). Psychological networks in clinical populations: Investigating the consequences of Berkson’s bias. *Psychological Medicine*, *51*(1), 168–176. https://doi.org/10.1017/S0033291719003209

DellaPosta, D. (2020). Pluralistic Collapse: The “Oil Spill” Model of Mass Opinion Polarization. *American Sociological Review*, *85*(3), 507–536. https://doi.org/10.1177/0003122420922989

Di Nicola, P. (2016). Babies are not Born under a Cabbage Leaf. *Italian Sociological Review*, *Vol 6*, 293 Pages. https://doi.org/10.13136/ISR.V6I2.135

Efron, B. (1979). Bootstrap Methods: Another Look at the Jackknife. *The Annals of Statistics*, *7*(1). https://doi.org/10.1214/aos/1176344552

Ellis, C., & Stimson, J. A. (2012). *Ideology in America* (1st ed.). Cambridge University Press. https://doi.org/10.1017/CBO9781139094009

Epskamp, S., Borsboom, D., & Fried, E. I. (2018). Estimating psychological networks and their accuracy: A tutorial paper. *Behavior Research Methods*, *50*(1), 195–212. https://doi.org/10.3758/s13428-017-0862-1

Epskamp, S., Waldorp, L. J., Mõttus, R., & Borsboom, D. (2018). The Gaussian Graphical Model in Cross-Sectional and Time-Series Data. *Multivariate Behavioral Research*, *53*(4), 453–480. https://doi.org/10.1080/00273171.2018.1454823

Fishman, N., & Davis, N. T. (2022). Change We Can Believe In: Structural and Content Dynamics within Belief Networks. *American Journal of Political Science*, *66*(3), 648–663. https://doi.org/10.1111/ajps.12626

Franetovic, G., & Bertero, A. (2023). How do people understand inequality in Chile? A study through attitude network analysis. *AWARI*, *4*. https://doi.org/10.47909/awari.42

Free, L., & Cantril, H. (1968). The Political Beliefs of Americans: A Study of Public Opinion. By Lloyd A. Free and Hadley Cantril. (New Brunswick: Rutgers University Press, 1967. Pp. 239. $10.00.). *American Political Science Review*, *62*(4), 1345–1346.

Fruchterman, T. M. J., & Reingold, E. M. (1991). Graph drawing by force‐directed placement. *Software: Practice and Experience*, *21*(11), 1129–1164. https://doi.org/10.1002/spe.4380211102

Giovannini, A., Valbruzzi, M., & Vampa, D. (2023). Special Issue Introduction – The 2022 Italian general election: A political shock or the new normal? *Italian Journal of Electoral Studies QOE-IJES*. https://doi.org/10.36253/qoe-14809

Grönlund, K., & Milner, H. (2006). The Determinants of Political Knowledge in Comparative Perspective. *Scandinavian Political Studies*, *29*(4), 386–406. https://doi.org/10.1111/j.1467-9477.2006.00157.x

Haslbeck, J. M. B. (2022). Estimating group differences in network models using moderation analysis. *Behavior Research Methods*, *54*(1), 522–540. https://doi.org/10.3758/s13428-021-01637-y

Haslbeck, J. M. B., & Waldorp, L. J. (2018). How well do network models predict observations? On the importance of predictability in network models. *Behavior Research Methods*, *50*(2), 853–861. https://doi.org/10.3758/s13428-017-0910-x

Haslbeck, J. M. B., & Waldorp, L. J. (2020). **mgm**: Estimating Time-Varying Mixed Graphical Models in High-Dimensional Data. *Journal of Statistical Software*, *93*(8). https://doi.org/10.18637/jss.v093.i08

Jost, J. T. (2006). The end of the end of ideology. *American Psychologist*, *61*(7), 651–670. https://doi.org/10.1037/0003-066X.61.7.651

Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political Ideology: Its Structure, Functions, and Elective Affinities. *Annual Review of Psychology*, *60*(1), 307–337. https://doi.org/10.1146/annurev.psych.60.110707.163600

Judd, C. M., & Krosnick, J. A. (1982). Attitude centrality, organization, and measurement. *Journal of Personality and Social Psychology*, *42*(3), 436–447. https://doi.org/10.1037/0022-3514.42.3.436

Judd, C. M., & Milburn, M. A. (1980). The Structure of Attitude Systems in the General Public: Comparisons of a Structural Equation Model. *American Sociological Review*, *45*(4), 627. https://doi.org/10.2307/2095012

Kalmoe, N. P. (2020). Uses and Abuses of Ideology in Political Psychology. *Political Psychology*, *41*(4), 771–793. https://doi.org/10.1111/pops.12650

Keskintürk, T. (2022a). Religious belief alignment: The structure of cultural beliefs from adolescence to emerging adulthood. *Poetics*, *90*, 101591. https://doi.org/10.1016/j.poetic.2021.101591

Keskintürk, T. (2022b). The organization of political belief networks: A cross-country analysis. *Social Science Research*, *107*, 102742. https://doi.org/10.1016/j.ssresearch.2022.102742

Lauritzen, S. L. (1996). *Graphical models* (Vol. 17). Clarendon Press.

Lavrakas, P. (2008). *Encyclopedia of Survey Research Methods*. Sage Publications, Inc. https://doi.org/10.4135/9781412963947

Malka, A., & Lelkes, Y. (2010). More than Ideology: Conservative–Liberal Identity and Receptivity to Political Cues. *Social Justice Research*, *23*(2–3), 156–188. https://doi.org/10.1007/s11211-010-0114-3

Martin, J. L. (2000). The relation of aggregate statistics on beliefs to culture and cognition. *Poetics*, *28*(1), 5–20. https://doi.org/10.1016/S0304-422X(00)00010-3

Martin, J. L. (2002). Power, Authority, and the Constraint of Belief Systems. *American Journal of Sociology*, *107*(4), 861–904. https://doi.org/10.1086/343192

Opsahl, T., Agneessens, F., & Skvoretz, J. (2010). Node centrality in weighted networks: Generalizing degree and shortest paths. *Social Networks*, *32*(3), 245–251. https://doi.org/10.1016/j.socnet.2010.03.006

Peffley, M. A., & Hurwitz, J. (1985). A Hierarchical Model of Attitude Constraint. *American Journal of Political Science*, *29*(4), 871. https://doi.org/10.2307/2111185

Sandri, G., & Seddone, A. (2015). Sense or sensibility? Political attitudes and voting behaviour of party members, voters, and supporters of the Italian centre-left. *Italian Political Science Review/Rivista Italiana Di Scienza Politica*, *45*(1), 25–51. https://doi.org/10.1017/ipo.2015.2

Schlicht-Schmälzle, R., Chykina, V., & Schmälzle, R. (2018). An attitude network analysis of post-national citizenship identities. *PLoS ONE*, *13*(12), e0208241. https://doi.org/10.1371/journal.pone.0208241

Schoen, H., & Schumann, S. (2007). Personality Traits, Partisan Attitudes, and Voting Behavior. Evidence from Germany. *Political Psychology*, *28*(4), 471–498. https://doi.org/10.1111/j.1467-9221.2007.00582.x

Sindermann, Rozgonjuk, D., Kannen, C., & Montag, and Christian. (n.d.). How many Dimensions underlie Political Attitudes? An Exploratory Graph Analysis Approach. *OSF Preprints*. https://doi.org/10.31219/osf.io/98rhs

Tedin, K. L. (1987). Political ideology and the vote. *Research in Micropolitics*, *2*(1), 63–94.

Tibshirani, R. (1996). Regression Shrinkage and Selection Via the Lasso. *Journal of the Royal Statistical Society: Series B (Methodological)*, *58*(1), 267–288. https://doi.org/10.1111/j.2517-6161.1996.tb02080.x

Tucker, J. A., Pacek, A. C., & Berinsky, A. J. (2002). Transitional Winners and Losers: Attitudes toward EU Membership in Post-Communist Countries. *American Journal of Political Science*, *46*(3), 557. https://doi.org/10.2307/3088399

Turner-Zwinkels, F. M., & Brandt, M. J. (2022). Belief system networks can be used to predict where to expect dynamic constraint. *Journal of Experimental Social Psychology*, *100*, 104279. https://doi.org/10.1016/j.jesp.2021.104279

van der Eijk, C., Brug, W. van der, Kroh, M., & Franklin, M. (2006). Rethinking the dependent variable in voting behavior: On the measurement and analysis of electoral utilities. *Electoral Studies*, *25*(3), 424–447. https://doi.org/10.1016/j.electstud.2005.06.012

Vegetti, F., & Littvay, L. (2022). Belief in conspiracy theories and attitudes toward political violence. *Italian Political Science Review/Rivista Italiana Di Scienza Politica*, *52*(1), 18–32. https://doi.org/10.1017/ipo.2021.17

Vergallo, G. M. (2019). The Marco Cappato and Fabiano Antoniani (dj Fabo) Case Paves the Way for New Assisted Suicide Legislation in Italy: An Overview of Statutes from Several European Countries. *European Journal of Health Law*, *26*(3), 221–239. https://doi.org/10.1163/15718093-12261428

Vezzoni, C., Ladini, R., Molteni, F., Dotti Sani, G. M., Biolcati, F., Chiesi, A., Maraffi, M., Guglielmi, S., Pedrazzani, A., & Segatti, P. (2020). Investigating the social, economic and political consequences of Covid-19: A rolling cross-section approach. *Survey Research Methods*, 187-194 Pages. https://doi.org/10.18148/SRM/2020.V14I2.7745

Vezzoni, C., Sani, G. M. D., Chiesi, A. M., Ladini, R., Biolcati, F., Guglielmi, S., Maggini, N., Maraffi, M., Molteni, F., Pedrazzani, A., & Segatti, P. (2022). Where does the Coronavirus come from? On the mechanisms underlying the endorsement of conspiracy theories on the origin of SARS-CoV-2. *Italian Political Science Review/Rivista Italiana Di Scienza Politica*, *52*(1), 51–65. https://doi.org/10.1017/ipo.2021.19

Westreich, D. (2012). Berkson’s bias, selection bias, and missing data. *Epidemiology (Cambridge, Mass.)*, *23*(1), 159–164.

Zaller, J. R. (1992). *The Nature and Origins of Mass Opinion* (1st ed.). Cambridge University Press. https://doi.org/10.1017/CBO9780511818691

1. This theory is socio-centric in that differences in constraint are traced to stratificational (political information, education) rather than psychological variables (e.g.: personality traits). [↑](#footnote-ref-1)
2. It can be shown that correlational networks can correctly isolate differences in edge weights only if the corresponding relationships have the same sign. Indeed, suppose that two beliefs, (e.g., support for redistribution and support for increased government spending) are positively correlated at the population level. It might be the case that, partitioning the sample by levels of political knowledge, the retrieved associations differ in sign, being positive for the more knowledgeable and negative for the other subsample. In this case, the BNA approach would fail to estimate the magnitude of this difference, since the edges it estimates correspond to the squared values of each correlation coefficient. [↑](#footnote-ref-2)
3. This is not the equivalent of claiming that these models completely resolve the mismatch, since correlations -even if partial- can not lead to causal inference. Isolating causality should be the goal of the desirable third wave of belief systems studies, as argued in the Discussion. [↑](#footnote-ref-3)
4. The potential of the rolling cross-sectional design was not exploited in this work. The final sample is obtained by merging the responses of all individuals who participated in the data collection. This is methodologically feasible due to the random assignment of respondents to the day of completion, which assures time is a random variable (for a thorough discussion of this survey design see Vezzoni et al., 2020). [↑](#footnote-ref-4)
5. The sample overrepresents males (639 respondents are males, 510 are women), is skewed towards an older sociodemographic profile (mean age in the sample is 53 years, against the national mean of 46.4), and presents severe disproportions regarding self-reported vote choice (359 individuals reported voting for the rightist coalition, 450 for the leftist, 195 for the 5SM). [↑](#footnote-ref-5)
6. The distinction between operational and symbolic beliefs involves a margin of subjectivity. To mitigate this limitation, one contribution classified attitudes into symbolic, operational, and "cross-level" categories (Keskintürk, 2022b). This paper adopts the binary scheme, as it is more consistent with the theory behind this distinction, and as these labels have here a descriptive purpose only. [↑](#footnote-ref-6)
7. Variables with seven or fewer response options are treated as ordinal (Boutyline & Vaisey, 2017; Keskintürk, 2022b). I compute Polychoric correlations for ordinal variables, Pearson correlations for quasi-continuous ones, and polyserial correlations for ordinal and quasi-continuous items. [↑](#footnote-ref-7)
8. In an undirected network, the maximum number of edges is equal to n(n-1)/2, where n is the number of network nodes. [↑](#footnote-ref-8)
9. In the remainder of the article, network nodes will be referred to in italics, and “w” indicates an edge weight. [↑](#footnote-ref-9)