Foreign Policy Attitudes as Networks

Supplementary Appendix

Joshua D. Kertzer* and Kathleen Powers†.

Contents

1 Foreign policy attitude research, 1970-2017 2
   Table 1: Attitude structure models, 1970-2017 . . . . . . . . . . . . . . . . . . . . . . . 2
   Figure 1: The citation network of foreign policy attitude structure research, 1970-2017 4

2 Materials and Instrumentation 7
   2.1 Study Sample . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7
   2.2 Selecting the Network Nodes . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 8
   2.3 Text of Persuasive Messages . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9
      2.3.1 Values . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9
      2.3.2 Orientations . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10
      2.3.3 Policy Positions . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 11
   2.4 Instrumentation . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 13
      2.4.1 Values: Moral Foundations Questionnaire . . . . . . . . . . . . . . . . . . . . 13
      2.4.2 Orientations . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15
      2.4.3 Policy Positions . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 16
   2.5 Political Knowledge Questions . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 17

3 Scale Reliabilities 18

4 Thresholding and sensitivity analyses 19

5 Supplementary Subgroup Analyses 23
   5.1 Gender . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 23
   5.2 Political Ideology . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 25

6 Additional permutation tests 27
   Figure 7: Permutation tests of network density . . . . . . . . . . . . . . . . . . . . . 28

References 29

*Paul Sack Associate Professor of Political Economy, Department of Government, Harvard University. jkertzer@gov.harvard.edu. Web: http://people.fas.harvard.edu/~jkertzer
†Assistant Professor of Government, Dartmouth College. kathleen.e.powers@dartmouth.edu. Web: http://www.kepowers.com/
1 Foreign policy attitude research, 1970-2017

As noted in the chapter, we compiled a list of 112 academic publications that the structure of foreign policy attitudes. After a thorough search procedure, we categorized each piece into one of two camps (the results of which are listed in Table 1), based on the underlying assumptions about patterns of attitude constraint in the of the models they put forward. A piece is listed in the “horizontal” constraint category — to borrow terminology from Holsti 1992 — if it assumes and looks for clusters of related policy attitudes along one or several dimensions. We classify a piece as “vertical” if it assumes that underlying predispositions or values determine individual policy preferences or other more specific orientations toward foreign policy — these pieces look for evidence of top-down constraint, often with regression-based or structural equation modeling approaches.

To empirically evaluate the extent to which different parts of the foreign policy attitude literature engage one another, we generate a citation network by encoding citations between each of the 112 pieces in an adjacency matrix, analyzing clustering in the network using a 4-dimensional latent position cluster model (LPCM) (Handcock, Raftery and Tantrum, 2007). Figure 1 plots the citation network in the first two dimensions of a four-dimensional Euclidean latent space; the pie chart corresponding to each article denotes the posterior probability (calculated using MCMC sampling) that the article is located in a particular cluster. The four colors correspond to the four groups that emerge from the data and present a striking picture of both the separation between research traditions and a contemporary conversation across the horizontal-vertical divide.

Figure 1 reveals four important patterns. First, there is a clear disciplinary divide. The green cluster represents work conducted by psychologists on foreign policy issues, relatively disconnected from developments in political science. Rathbun et al. (2016) cites Mayton,
Table 1: Foreign policy attitude structure model pieces, 1970-2017

<table>
<thead>
<tr>
<th>Citation</th>
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<td></td>
<td>Wittkopf and Maggiotto (1983b)</td>
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</tbody>
</table>

Note: H and V refer to horizontal and vertical models of attitude structure, respectively. Numbers correspond to node numberings in Figure 1 in the main text.
By examining the citation patterns between the 112 foreign policy attitude network pieces, a latent position cluster model (LPCM) classifies the literature into four clusters. An arrow from node $i$ to node $j$ shows that article $j$ cites article $i$: thus, for example Mayton, Peters and Owens (1999) is cited by Vail and Motyl (2010b). The pie chart for each article represents the posterior probability (estimated using 5000 MCMC samples) that each article falls into a particular cluster; here, the red represents work on trade attitudes, the green represents a cluster of psychological work on foreign policy attitudes, dark blue shows an older horizontal tradition, and dark blue represents a newer wave that combines both vertical and horizontal models. The x and y axes represent the first two principal components in a four-dimensional Euclidean latent space as measured by the Minimum Kullback-Leibler (MKL) estimates. The LPCM is estimated using the latentnet package in R (Krivitsky and Handcock, 2008).
Peters and Owens (1999) — providing the sole edge that connects this green cluster to the political science literature. This disciplinary divide works both ways: work on attitudes towards war and peace in psychology has largely ignored what political scientists have had to say on the question, and vice versa. Second, the red cluster reveals a substantive divide between security and economics that has gone largely unacknowledged by foreign policy attitude scholars: 15 of 16 pieces on trade attitudes are classified in the red group. While this substantive segregation is not as stark as the disciplinary gulf shown by the green cluster, it provides a clear indication that work on the structure of trade attitudes has proceeded somewhat independently of the study of other foreign policy attitudes. This division also suggests a reason for the vertical dominance in trade attitudes research disconnected from debates about horizontal structure, scholars have proceeded from a similar starting point. They analyze the relative influence of nationalism (e.g., Mayda and Rodrik, 2005) or social trust (e.g., Kaltenthaler and Miller, 2013), but tend not to explore these structural assumptions in further detail.

Third, the dark blue clusters confirm our observation that the first wave of foreign policy attitude research comprises primarily horizontal models. The dark blue cluster contains 28 of 57 horizontal pieces, all published in 1998 or earlier, and only two vertical articles. Fourth, the group depicted in light blue shows a newer tradition that contains both contemporary horizontal pieces (e.g., Gravelle, Reifler and Scotto, 2017) and 80% of the non-trade articles categorized as vertical (e.g., Hurwitz and Peffley, 1987b; Goren et al., 2016). This suggests that when vertical models began to dominate foreign policy attitude research, they were more likely to be acknowledged by the opposing camp.

The citation network and LPCM results demonstrate disciplinary, substantive, temporal, and theoretical divides in the literature. While the separation between psychology and political science is perhaps unsurprising given academic balkanization, it suggests that scholars from both fields could work to more deeply engage one another’s work. Similarly, we hope that future political science scholarship will enhance our understanding of how trade attitudes fit into a person’s broader foreign policy belief system rather than treating them as functionally separate attitudes. Is support for free trade the product of universalist values that promote cooperation (Rathbun et al., 2016)? Do trade attitudes form a distinct posture to supplement the familiar cooperative and militant internationalism, or do they correlate with another accepted latent dimension like isolationism? Such questions offer a promising agenda for future work on foreign policy attitudes. Finally, although horizontal and vertical models of the study of foreign policy attitudes were developed largely in isolation with one
another, the gap between the two has gradually narrowed over time. Yet ties in a citation network do not necessarily indicate theoretical integration. In the next section, we suggest what such a synthesis might look like.
Materials and Instrumentation

2.1 Study Sample

As per Berinsky, Huber and Lenz (2012), participants were paid $1.00 for participation. Participants were required to be at least 18, US citizens, and have a high approval rating on previous work. Samples from Mechanical Turk are increasingly used in the social sciences and published in top journals (e.g., Arceneaux, 2012; Grimmer, Messing and Westwood, 2012) because of the extent to which they replicate classic experiments on more diverse samples than traditionally employed in political psychology (Berinsky, Huber and Lenz, 2012).

This sample is valuable for our purposes both because the length of instrument and complexity of our experimental design would render the study infeasible if embedded in a national survey, but also because of the nature of the theories being tested. First, since most studies presume that attitudes are structured similarly across individuals, we should not require a nationally representative sample to find evidence in favor of existing models (Druckman and Kam, 2011, 46). Second, since conceptualizing attitudes as networks assumes that attitude structure varies with individual characteristics, we do not expect there to be a single model of attitude structure that applies to the whole population.
2.2 Selecting the Network Nodes

Before presenting the instrumentation, we first briefly discuss the motivation for our theoretically-informed 11-node network. We chose the four core values of authority/respect, harm/care, ingroup/loyalty, and fairness/reciprocity for three reasons. First, they are central in contemporary psychological literature on moral values (Haidt and Graham, 2007). Whereas fairness/reciprocity and harm/care — reflecting concerns about equality and compassion, respectively — are “individualizing foundations” important for both liberals and conservatives, authority/respect and ingroup/loyalty — the former emphasizing deference to authority figures and the latter focusing on protecting group members — are “binding foundations” fundamental only to conservatives (Graham, Haidt and Nosek, 2009). Second, two of the foundations (authority/respect and fairness/reciprocity) relate closely to what Rathbun (2007b) terms hierarchy and community, values targeted in his model of elite foreign policy beliefs. Third, recent research corroborates our expectations that moral values matter for foreign policy (Kertzer et al., 2014).

We select militant internationalism (MI) and cooperative internationalism (CI) — respectively, an individual’s belief that the U.S. military should play an active role in international affairs, or that the U.S. should work with other countries to solve global problems — as two mid-level foreign policy orientations. These are selected because of Wittkopf’s (1990b) pervasive framework, which remains the standard in contemporary work (Gravelle, Reifler and Scotto, 2017). We include the third orientation, isolationism, to assess general preferences for disengagement independent of MI and CI (Holsti, 1979b; Rathbun et al., 2016).

Finally, we include four specific policy attitudes: positions on the Iraq War and the intervention in Libya, alongside support for potential U.S. military involvement in Syria and whether to establish a post-Kyoto climate change agreement. These policy items vary in two key respects. First, attitudes toward the Iraq war are likely to be widely connected due to their long-term salience, allowing us to determine the extent to which individuals extrapolate from one battleground to another when forming their views. Second, they represent a range of policies that are positively associated with MI (Iraq, Syria), CI (Kyoto), or both (Libya), to test whether stimulating one follows the logical patterns of constraint proposed in previous research (Kertzer et al., 2014).
2.3 Text of Persuasive Messages

2.3.1 Values

Authority/respect/hierarchy
Philosophers throughout history have stressed that people should show respect for authority figures in a society. Authority figures represent the wisdom of their position and can help people have better lives by protecting them. They also act as exemplars, such that people can learn from them about how to achieve success in their own lives. Prominent psychologists state that many cultures value “virtues related to good leadership, which involve[s] magnanimity, fatherliness, and wisdom.” This emphasis has been echoed by research in anthropology and sociology, which demonstrates the importance of hierarchies and traditions to most cultures. Respecting legitimate authority figures is considered virtuous and fosters a happy and healthy environment for all members of a community. For these reasons, respecting persons in positions of authority is widely regarded as good for both individuals and society.

Fairness/reciprocity/community
Philosophers throughout history have stressed that people should treat all other people just as they wish to be treated themselves. More contemporary evidence suggests that using this ‘golden rule’ as a guide will produce increasing levels of success in business practices and relationships because it helps to build trust. Prominent psychologists state that “all cultures have developed virtues related to fairness.” This emphasis has been echoed by research in anthropology and sociology, which demonstrates the importance of reciprocity and justice to the cores of societies all over the world. Adherence to such virtues helps to foster happy and healthy environments for all members of a community. For these reasons, equal and just treatment of other humans is widely regarded as good for both individuals and society.

Harm/care
Philosophers throughout history have stressed that people should avoid doing harm to others, and seek to alleviate suffering where possible. This principle is enshrined in contemporary medical practice, where doctors vow to “first, do no harm.” Prominent psychologists further state that people in most cultures “feel approval to toward those who prevent or relieve harm.” This emphasis has been echoed by research in anthropology and sociology, which demonstrates the importance of kindness as a virtue in societies throughout the world. Adherence to such virtues helps to foster happy and healthy environments for all members of a community.
community. For these reasons, kind and compassionate, rather than harmful, treatment of other humans is widely regarded as good for both individuals and society.

Ingroup/loyalty
Philosophers throughout history have stressed that people should stay loyal to members of groups to which they belong. Other members of the same group can be trusted and are easy to cooperate with. Thus, it is considered virtuous to stay loyal to one’s group and to make sacrifices to protect and improve the group as a whole. Prominent psychologists state that “most cultures have constructed virtues such as loyalty, patriotism, and heroism.” This emphasis has been echoed by research in anthropology and sociology, which demonstrates the importance of group solidarity to strong societies. Adherence to such virtues fosters a happy and healthy environment for all members of a community. For these reasons, being a loyal member of one’s group is widely regarded as good for both individuals and society.

2.3.2 Orientations

Militant Internationalism
Many countries and international leaders construct policy in order to have a positive impact on the world. Often, this requires military force on the part of one or both states. For example, countries sometimes need to use their military to stop another country from starting a war, or to intervene when there is no other way to solve a dispute. Scholars and diplomats alike recognize the benefits of using military force under certain conditions, with one prominent leader recently stating that “to say that force may sometimes be necessary... is recognition of history,” and is often essential for maintaining order in the world. Countries should use force when they are threatened or when it will produce a positive outcome, and military interventions in history have been successful ways for countries to resolve their differences. Thus, many agree that the use of military force abroad is a good foreign policy tool.

Cooperative Internationalism
Many countries and international leaders construct policy in order to have a positive impact on the world. Often, this involves working diplomatically with other nations and international organizations to provide aid or produce an acceptable solution to a pressing global problem. For example, states can come together to establish guidelines for the protection of human rights or to aid the economic development of other nations. Scholars and diplomats
alike recognize the benefits of such cooperation. Regarding the provision of aid for the building of new police stations abroad to cut down on international crime, one prominent leader recently remarked that “the solution of the most important problems require international cooperation, and this project is a testimony of what international cooperation for development can do.” Many others agree that it is good when countries have positive diplomatic relations with other countries and work with them and through international institutions to solve global problems.

**Isolationism**

Many countries and international leaders construct policy in order to have the most positive impact. Often, this involves focusing primarily on domestic issues, so that the country can primarily establish their own national prosperity. For example, a state might focus on improving its own economy rather than becoming entangled in agreements with or the affairs of other countries. Scholars and diplomats alike recognize the benefits of such an emphasis on domestic affairs. One prominent leader, for example, recently stressed that the United States should focus first on “our energy, economic, and domestic policies,” as they all advance the national interest. Many others agree that it is good when countries put their domestic priorities first and avoid entanglements abroad.

### 2.3.3 Policy Positions

**The Iraq War**

In 2003, the United States led a coalition in an invasion of Iraq due to fears that the government possessed weapons of mass destruction. In the time that has passed since the beginning of the war, many American citizens have come to see it as a positive intervention. The occupation of Iraq and activities by the U.S. has helped to bring prosperity to an otherwise faltering nation. The country has also become increasingly more stable over time. One prominent US leader noted this recently, stating that he “agrees with the invasion of Iraq” because it “was the right thing to do” and that all Americans should “desire to see signs of hope across Iraq flourish.” With time, then, we have come to know that this intervention was crucial in stopping the potential military threat from Iraq and the various human rights abuses under Saddam Hussein. There would have been substantially more violence and instability in the state without the intervention of the United States and other coalition forces.

**NATO Air strikes on Libya**
In early 2011, armed conflict emerged in Libya between supporters of the current leader Muammar Gaddafi and rebels who sought to remove his government from power. In response, several countries, including the United States, engaged in military action in support of the rebels. One prominent US leader recently stated that this involvement was necessary, because “you had a potentially significantly destabilizing event taking place in Libya.” With time, we have come to know that this intervention was crucial in putting an end to the massacre of many Libyans by oppressive government forces. It helped to bring a swifter end to the violence, and many agree that it was a good decision. There would have been many more deaths and dangerous regional instability without the involvement of other states.

*Intervention in Syria*

In early 2011, armed conflict emerged in Syria between supporters of the current government led by President Bashar al-Assad and protesters who sought to remove his government from power. The government crackdown against the protestors and ongoing civil war has resulted in some 60,000 deaths. As a consequence, many prominent analysts and world leaders have called for the US to intervene in the conflict, by directly arming rebel soldiers or even sending their own troops, despite the disapproval voiced by fellow United Nations Security Council members China and Russia. One prominent leader and analyst, stresses this when he states that “we must certainly consider direct military action” by “[using] force ourselves, or see the Assad regime murder its way to victory.” With time, it has become evident to many that an intervention will be the only way to put an end to the violence. An intervention could prevent more deaths and dangerous regional instability.

*Kyoto Protocol*

In 1997, delegates from 194 countries met in Kyoto, Japan and crafted an agreement to reduce the amount of greenhouse gas emissions throughout the world. This agreement, the Kyoto Protocol, expired at the end of 2012, and countries have not yet established a new treaty to replace it. Many analysts and leaders argue that the United States should become heavily involved in negotiating a new treaty designed to curb greenhouse gas emissions and protect the global environment. One prominent leader in the United States stresses this point when he states that “we are ready, willing, and able” to have a discussion about establishing a new climate agreement. US support for and promotion of a new treaty will be crucial to its future success.
Control: Online Retail

Internet retail has emerged in recent years as a prominent mode of commerce. One of the most important ways that sellers increase the number of people interested in purchasing their product is by earning positive customer reviews. These are easily accessible by individuals while they are shopping via the internet, and many people report using them to determine their ultimate purchase. As a result, the importance of online retail is only expected to increase. Time Magazine recently announced that online shopping was the holiday season’s top shopping trend, and $1.25 billion was spent online on Cyber Monday alone.

2.4 Instrumentation

2.4.1 Values: Moral Foundations Questionnaire

We measure participants’ moral values using four of the moral values from the Moral Foundations Questionnaire (Graham et al., 2011). As is standard with the MFQ, each moral foundation is measured with six items, the first three of which are responses to the question “When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking?” These items have 6 point Likert responses ranging from “not at all relevant” to “extremely relevant.” The second three items for each foundation are 6 point Likert responses from “Strongly disagree” to “Strongly agree.” Items are presented to participant in two blocks – one with the first 3 items from each scale and one with the latter 3 items from each scale – with the order of items randomized within blocks.

Authority/Respect ($\alpha = 0.719$)

1. Whether or not someone showed a lack of respect for authority
2. Whether or not someone conformed to the traditions of society
3. Whether or not an action caused chaos or disorder
4. Respect for authority is something all children need to learn.
5. Men and women each have different roles to play in society.
6. If I were a soldier and disagreed with my commanding officer’s orders, I would obey anyway because that is my duty.

Fairness/Reciprocity ($\alpha = 0.666$)
1. Whether or not some people were treated differently than others

2. Whether or not someone acted unfairly

3. Whether or not someone was denied his or her rights

4. When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.

5. Justice is the most important requirement for a society.

6. I think it’s morally wrong that rich children inherit a lot of money while poor children inherit nothing.

\textit{Harm/Care (α = 0.710)}

1. Whether or not someone suffered emotionally

2. Whether or not someone cared for someone weak or vulnerable

3. Whether or not someone was cruel

4. Compassion for those who are suffering is the most crucial virtue.

5. One of the worst things a person could do is hurt a defenseless animal.

6. It can never be right to kill a human being.

\textit{Ingroup/Loyalty (α = 0.727)}

1. Whether or not someone’s action showed love for his or her country

2. Whether or not someone did something to betray his or her group

3. Whether or not someone showed a lack of loyalty

4. I am proud of my country’s history.

5. People should be loyal to their family members, even when they have done something wrong.

6. It is more important to be a team player than to express oneself.
2.4.2 Orientations

Each item has a seven-point Likert response scale ranging from “Strongly disagree” to "Strongly agree”. Items for each orientation are presented together in a block, with block order randomized.

*Militant internationalism* ($\alpha = 0.783$)

1. The United States should take all steps including the use of force to prevent aggression by any expansionist power

2. Rather than simply countering our opponents’ thrusts, it is necessary to strike at the heart of an opponent’s power.

3. Going to war is unfortunate but sometimes the only solution to international problems.

4. In dealing with other nations our government should be strong and tough.

*Cooperative internationalism* ($\alpha = 0.789$)

1. The United States needs to cooperate more with the United Nations.

2. It is essential for the United States to work with other nations to solve problems such as overpopulation, hunger, and pollution.

3. In dealing with other nations our government should be understanding and flexible.

4. The best way to ensure peace is to sit down with other countries and work out our disagreements.

*Isolationism* ($\alpha = 0.814$)

1. The U.S. should mind its own business internationally and let other countries get along the best they can on their own.

2. We should not think so much in international terms but concentrate more on our own national problems.

3. The U.S. needs to play an active role in solving conflicts around the world. *(Reverse-coded)*

4. America’s conception of its leadership role in the world must be scaled down.
2.4.3 Policy Positions

The Iraq War ($\alpha = 0.788$)

1. All things considered, do you approve or disapprove of the U.S. decision to intervene in Iraq? (7-point scale from “Strongly disapprove” to “Strongly approve”)

2. Considering the costs to the United States versus the benefits to the United States, do you think the war in Iraq was worth fighting, or not? (5-point scale from “Not worth it” to “Worth it”)

NATO Air Strikes on Libya ($\alpha = 0.764$)

1. All things considered, do you approve or disapprove of the decision of the U.S. and its allies to conduct military air strikes in Libya? (7-point scale from “Strongly disapprove” to “Strongly approve”)

2. Do you think the U.S. did the right thing by using military force in Libya now, or should the US not have been involved in Libya? (4-point scale from “Definitely the wrong thing” to “Definitely the right thing”)

Intervention in Syria ($\alpha = 0.742$)

1. Would you favor or oppose the U.S. and its allies sending arms and military supplies to anti-government groups in Syria? (7-point scale from “Strongly oppose” to “Strongly favor”)

2. Would you approve or disapprove of the use of U.S. forces to protect the anti-government protesters in Syria? (7-point scale from “Strongly disapprove” to “Strongly approve”)

Kyoto Protocol ($\alpha = 0.827$)

1. The Kyoto Protocol, the global treaty designed to curb greenhouse gas emissions, expired in 2012. Do you approve or disapprove of the United States working closely with other nations to create a new international treaty to fight global warming? (7-point scale from “Strongly disapprove” to “Strongly approve”)

2. How much do you think the U.S. government should do about global warming? (5-point scale from “Nothing” to “A great deal”)
2.5 Political Knowledge Questions

1. Who is the current vice-president of the United States?

2. How much of a majority is required for the U. S. Senate and House to override a presidential veto?

3. Which political party currently holds the majority (has the most members) in the U. S. House of Representatives?

4. Which political party, Republican or Democratic, is more conservative?

5. Who is the Speaker of the U.S. House of Representatives?

6. Who is the current majority leader of the U.S. Senate?

7. Who is the Prime Minister of the United Kingdom?

8. What country is led by Hamid Karzai?

9. Which five countries are permanent members of the U.N. Security Council?
3 Scale Reliabilities

Table 2: Scale reliabilities

<table>
<thead>
<tr>
<th>Scale</th>
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<td>Authority</td>
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<td>Political knowledge</td>
<td>α = 0.684</td>
</tr>
</tbody>
</table>
4 Thresholding and sensitivity analyses

A central question in network analysis is how to define the network’s edges, particularly when some types of relations are less easily dichotomized than others, and thus have more ambiguous criteria as to what constitutes an edge. Typically network analysts make two choices: either include all potential edges and simply weight them by their strength (Thomas and Blitzstein, 2011), or threshold based a particular cut point. As illustrated in Figure 2 below, in the main analyses in the text, we employ a cut point of 10%, taking the top decile of treatment effects in our experimental results (shaded in the darker grey) and using them to generate our networks. We represent our treatment effects with t-statistics, since they capture both the difference in means between the treatment and control groups and also their sample sizes and standard deviations, but a variety of other statistics could be used — the choice of which depends on the nature of the analyses. In order to ensure that the patterns of results we present above are not simply artifacts of this 10% cut point, we conduct a series of sensitivity analyses below probing the robustness of our two main findings (the prevalence of bottom-up constraint, and the network density’s curvilinear relationship with political knowledge and interest) to our thresholding criteria.

In the sensitivity analyses, we generated six different versions of the network, defining the edging threshold as the top 1%, 5%, 10%, 15%, 20%, and top 25% of the treatment effects, respectively. As one would expect, the more restrictive the threshold, the fewer edges are included in the adjacency matrix, and the less dense the networks, while the less restrictive the threshold, the more edges are included in the adjacency matrix, and the more dense the networks. Figure 3 plots the total degree centrality, indegree centrality, and outdegree centrality scores for core values (depicted as circles) and policy attitudes (depicted as triangles) across all of the attitude networks generated at each effect threshold. If our networks are characterized by bottom-up constraint, we should see that policy attitudes consistently play a larger role in our networks than core values — that is, the triangles should be higher than the circles. If, however, our networks are characterized by top-down constraint, we should see that core values consistently play a larger role in our networks than

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4W statistics from nonparametric rank sum tests, for example, are a function of sample size, so simply thresholding the network based on the effects with the largest W statistics would be inappropriate when the effects are drawn from samples of different sizes. Similarly, if analysts were interested in employing local fdr or FDR to control the false discovery rate, the statistics in the distribution should be z statistics and p values from t-tests, respectively.

5The analyses add across all of the different networks we generate in the piece (the network for the full sample, the liberal and conservative networks, the low, medium and high knowledge networks, etc.), but the results also hold when the subsample networks are dropped and only the full network is considered.
The histogram plots the distribution of effect sizes, represented here using t-statistics. The largest 10% of the treatment effects are shaded, indicating those effects for which edges are drawn in the attitude networks. Other thresholds can also be applied, but the key point is that significance is inferred not in reference to particular parametric assumptions or assumed populations, but rather in relation to the observed data itself.

core values — that is, the circles should be higher than the triangles. As the three panels of Figure 3 make clear, although the overall centrality scores for both core values and policy attitudes increase as less restrictive effect thresholds are employed, the centrality scores for policy attitudes are always higher than for core values — and in this sense, we find strong support for bottom-up constraint regardless of the effect threshold used in the analyses.

Figure 4 probes the robustness of the other main finding from the piece: the curvilinear relationship that knowledge and political interest have with attitude network density. In the main analyses in the text that use a 10% effect threshold, we find that medium knowledge respondents displayed the densest attitude networks compared to their low- and high-knowledge peers, while medium-interest respondents displayed less dense attitude networks compared to their low- and high-interest counterparts. As in the analyses reported in Figure 3, we generated six different versions of each network (using a 1%, 5%, 10%, 15%, 20% and 25% effect threshold), this time focusing on the low, medium, and high political
knowledge networks and the low, medium and high political interest networks. As Figure 4(a) shows, as long as the effect threshold is greater than 1% (whereupon all three knowledge networks have an equally low density), we replicate the same findings detected with a 10% threshold, with the medium knowledge network displaying a greater number of edge than either the low or the high knowledge networks. Similarly, Figure 4(b) shows that as long as the effect threshold is greater than 1%, we see an inverse-U shaped relationship between foreign policy interest and network density. Together, Figures 3 and 4 show that even as the individual edges included in these networks change as the edge threshold is tightened or relaxed, the network-level properties (the prevalence of bottom-up constraint, and the curvilinear relationships between network density and political knowledge and interest) persist, mitigating concern about the effect of measurement error.

Figure 3: Sensitivity analyses: relative centrality of core values versus policy orientations

The sensitivity analyses show robust evidence for bottom-up constraint: core values (depicted by circles) consistently have lower centrality scores than specific policy attitudes (depicted by triangles).
The sensitivity analyses show consistent evidence for quadratic effects of political knowledge (panel a) and interest (panel b) on network density once the effect threshold is above 1%; effect thresholds are labeled on the right-hand side of each panel.
5 Supplementary Subgroup Analyses

5.1 Gender

The main text presents an analysis of the full network along with networks separated by political ideology and sophistication. However, these are not the only dimensions of individual difference upon which we expect structural variance. An individual’s gender, too, might impact the type and direction of foreign policy attitude constraint. Some previous scholarship has shown that the foreign policy attitudes of men and women occasionally diverge in limited ways (such as with regard to defense spending) but can be captured by the same dimensions (Holsti and Rosenau, 1981) or are determined by the same hierarchically constraining elements (Fite, Genest and Wilcox, 1990). Other work in psychology, however, suggests that women and men develop and rely on different sets of values to make judgments (Gilligan and Attanucci, 1988; Jaffee and Shibley Hyde, 2009).

Thus, Figure 5 disaggregates the foreign policy networks for women and men, respectively. We find that the Female network is driven largely by attitudes about the airstrikes in Libya, and more generally that policy positions serve as the most important sources of constraint. Attitudes toward Libya influence two core values as well as positions on Syria, and the nodes representing attitudes toward the war in Iraq, Syria, and the Kyoto Protocol each have outgoing connections. The permuted analyses confirm the importance of specific policy positions to the female network, demonstrating that there are more outgoing edges than we would otherwise expect ($p = 0.014$). The Male network, in contrast, has more evenly distributed connections — values, policies, and orientations are about equally central, suggesting that specific policy events may be more important sources of constraint for women than for men. These distinctions may help to explain why the gender gap in foreign policy attitudes seems to fluctuate based on the issue and time, with men and women coming to their states attitudes via different pathways (Holsti, 2004). Additionally, we see patterns that are only evident from a systemic perspective, and that challenge the assumptions implicit in previous work: attitudes at the same level of analysis influence each other (as with harm and authority for men, or the reciprocal connection between Libya and Syria for women), and we have already noted that constraint in the female network works primarily from the bottom up.
Figure 5: Foreign policy attitude network by gender

(a) Female

(b) Male

Note: Arrows represent the patterns of attitude constraint; nodes are scaled by their degree centrality, so larger nodes are connected to a higher number of other attitudes. Core values are represented as circles, foreign policy orientations as diamonds, and policy attitudes as triangles. Neither network conforms with patterns expected by either the horizontal or the vertical models: attitudes at the same level of abstraction influence one another (e.g. harm and authority, for men), and we see signs of bottom-up constraint (e.g. Libya and ingroup, for women).
5.2 Political Ideology

The psychological literature on political ideology tells us that liberals and conservatives believe in fundamentally different things (e.g. they rely on different moral foundations — Graham, Haidt and Nosek 2009) for fundamentally different reasons (e.g. they maintain their belief systems in response to strikingly different social-cognitive motivations — Jost et al. 2003). In contrast to “one-size fits all” models of attitude structure, we thus expect that liberals and conservatives would organize their attitudes differently. As shown by Figure 6, liberals and conservatives maintain distinct foreign policy attitude networks, with CI central to the conservative network, and isolationism situated most centrally in the liberal network. Whereas attitudes toward the airstrikes in Libya, renewing the Kyoto Protocol, and intervening in Syria constrain CI for conservatives, they influence isolationism for liberals.

One thing that the liberal and conservative networks share, then, is the prominence of bottom-up patterns of constraint going from policy positions to general orientations: for conservatives, for example, values shape fewer attitudes ($p = 0.097$) and policies shape more ($p = 0.062$) than expected by chance. The directions of the observed links, along with the existence of links between orientations such as CI and isolationism for liberals, are inconsistent with the directional assumptions from past work. Interestingly, while the structural patterns of constraint clearly differ in these networks, their overall topology is relatively similar, and Hamming distance scores suggest that these networks are the least distinct from one another of all of the subgroup networks presented here — indicating perhaps that other individual level characteristics, such as political sophistication, are more important for understanding the underlying variation in foreign policy attitude networks.
Figure 6: Foreign policy attitude network by political ideology

(a) Liberals
(b) Conservatives

Note: Arrows depict the thresholded treatment effects, and thus, patterns of attitude constraint; nodes are scaled by their degree centrality. Core values are represented as circles, foreign policy orientations as diamonds, and policy attitudes as triangles. Thus, we see that liberals and conservatives display different patterns of attitude constraint — for example, CI shapes isolationism for liberals, but isolationism shapes CI for conservatives — but once again, both attitude networks show considerable bottom-up patterns of constraint, as specific policy attitudes shape foreign policy orientations and core values.
6 Additional permutation tests

The main analyses employ permutation tests that examine the probability of particular node-level attributes by randomly generating 10000 networks of an identical size and density as our observed network, thereby observing the probability that, for example, core values would display a particular level of constraint due to chance alone.\(^6\) While conditioning the permutation test on observed network densities allows us to determine the probability of given node-level statistics, it does not let us make inferences about the probability of observing given densities themselves. Thus, Figure 7 displays the results from a permutation test to evaluate the density of each network, randomly generating 99000 networks of an identical size of each observed network, in which the probability of each edge forming is varied from 0.01 to 0.99 every 1000 permutations. This technique is used to test two different null hypotheses: a random null hypothesis in which each edge has an identical probability of forming, and an informative null hypothesis in which the edge probabilities are constrained to 0 according to the assumptions of the hierarchical model – that is, all constraint is top-down rather than bottom-up or within-levels. Thus, Panel (a) of Figure 7 shows that against a random null hypothesis, we are unlikely to see the observed density for our full network if the probability of any given edge forming is greater than 0.1. Similarly, Panel (b) shows that against a hierarchical null hypothesis, we are unlikely to see the observed density for our full network if the probability of any given edge forming is less than 0.1 or greater than 0.3.

\(^6\)As Butts (2008, fn. 5) notes, this type of permutation test is popular amongst network analysts, although the terminology used to describe the test often varies: Butts refers to them as Conditional Uniform Graph Tests.
The figures plot the results of permutation tests that compare each observed network density with 99000 randomly generated networks of identical size, in which the probability of each edge forming varies from 0.01 to 0.99 every 1000 permutations. The top panel shows the results from a random null hypothesis in which each potential edge is drawn with the probability denoted on the x-axis, while the bottom panel shows the results from an informative null hypothesis corresponding to the predictions from a hierarchical model, in which each potential edge is drawn with the probability denoted on the x-axis only if the edge is also commensurate with top-down patterns of constraint (e.g., all edges from policy attitudes to core values, for example, are constrained at 0). These heatmaps thus plot the expected probability that we would see networks of the observed density for each edge probability.
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