Organized Culture and Organizational Cultures: The Dynamic Constraint of Religious Belief Systems Over Time[*]

Kevin Kiley, Duke University[†]

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Abstract

To what extent does social life constrain a person's attitudes over time, and what facilitates this stability? Existing sociological research varies in the degree to which it suggests that attitudes are constrained, while simultaneously arguing in favor of three principal sources of constraint: organizations, social networks, and cultural schema. This paper makes three contributions to these debates. First, I argue that rather than think of constraint as evident in pairwise relationships between attitudes at a single point in time, as many existing measures do, constraint should be thought of as restrictions on which attitudes people feel like they can give over time. Second, I use Latent Class Analysis to derive five belief systems that differently constrain religious, family, and moral beliefs in the National Study of Youth and Religion and show that the variance in responses within groups at the survey's second wave strongly predict how much people change their responses over time, as well as which responses they give. Third, I adjudicate between cultural-schematic, organizational, and social network sources of attitude structuring, showing that as people change their organizational and social contexts, their beliefs remain more stable than these changes would imply, suggesting that belief structures are organized early in life and shape people's beliefs and behaviors over time.

1 Introduction

A key way the social world is assumed to shape individual behavior is by constraining people's understanding of which attitudes, beliefs, and behaviors are compatible (**???**). In is through this process that society is assumed to get "into the heads" of people and reproduce itself (**???**), create patterns of attitude association in the population (Rawlings 2020; DellaPosta 2020; Goldberg and Stein 2018), and shape behaviors and affiliation over time (Vaisey 2009).

However, actual evidence of this cognitive structuring of belief systems in the public is mixed, raising questions about whether the general public's beliefs are as constrained as sociological theories often suggest (Converse 1964; Zaller 1992). In sociology, measures of attitude structuring and constraint have tended to focus, in one form or another, on the pairwise relationship between variables in cross-sectional data (Baldassarri and Gelman 2008; Baldassarri and Goldberg 2014; Boutyline

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[†]Ph.D. Candidate, Department of Sociology, Duke University, kevin.kiley@duke.edu.

and Vaisey 2017; Goldberg 2011; Hunzaker and Valentino 2019; Martin 2002). This work has led to numerous insights into the structuring of political and cultural thought in different groups, heterogeneity in belief patterns, and the social factors that give rise to constrained thinking.

But there are two central problems with this approach. First, decades of research in cultural sociology find that people do not have *an* attitude on a topic, but rather a range of considerations shaped by past experiences (Converse 1964; Swidler 1986, 2001 @zaller1992). Because they often hold contradictory considerations, and because which considerations influence cognition at any time can be shaped by local circumstances such as features of the interview setting or event outside of the interview, their attitudes appear to change substantially over time. This means that responses at a single point in time can be a bad measure of the bredth (or narrowness) of a person's range of considerations. On one hand, this frequent movement suggests that attitudes are not constrained in the population, as people seem free to change one attitude without changing attitudes that researchers expect to be linked. However, work in psychology suggests that the people who understand attitudes as related are the least likely to change (Howe and Krosnick 2017), and some members of the population are quite stable in their dispositions over time (Freeder, Lenz, and Turney 2019; Zaller 1992). This means that people might understand attitudes as related – the exact definition of this cognitive form of constraint – and as a result *not* change their attitudes.

The second major challenge of this approach is apparent in the central metaphor these researchers use to explain constraint: movement. Across these works, constraint is consistently described as limitations on the movement of attitudes over time, but it is rarely tested using within-person, over-time data (for an exception, see Rawlings 2020). In using static measures of constraint, researchers tend to assume that because people hold two ideas at the same time or because beliefs co-vary in the population, people understand these ideas as related and constraining. But co-occurrence and co-variance in static data does not prove the cognitive linkages or the presence of constraint that these researchers tend to assume (J. L. Martin 2000). The clustering of people in social groups with divergent attitudes could be driven by a number of processes besides cognitive linkage, such as socialization or selection (Lewis and Kaufman 2018; Vaisey and Lizardo 2010).

Because measuring the structure of beliefs has proven so difficult, theories that posit that attitudes are principally shaped by orgnaizational and social influences have tended to dominate explanations for the social structuring of attitudes, even though attitudes appear to be much more stable over time than would be predicted (**???**).

In this paper, I attempt to reconcile these conceptual and methodological issues by rethinking the empirical signature of a belief system. I make three principal contributions. First, drawing on insights from sociology of culture and cognition, the social psychology of attitude development, and political psychology, I argue that the cultural/cognitive variant of constraint is not well demonstrated by attitude clustering at a single time, measures of relationships between attitudes at a single time, or even pairwise change over time. Instead, a belief system should be conceptualized as a set considerations that results in a restriction (or lack of restriction) on which responses a person feels they can give over time. Rather than assume belief systems constrain similar beliefs, I argue that belief systems vary in how extensive they are – the number of beliefs they constrain – as well as how intensive they are – the degree to which they constrian different beliefs.

Second, given this framework of constraint, I argue that Latent Class Analysis – a method of data reduction that groups people into classes that have similar probabilities of giving different responses – reflects the theoretical tenets of this kind of attitude constraint better than many existing measures designed to tap attitude structuring, such as pairwise correlation, relational class analysis,

and correlational class analysis (Converse 1964; **???**; **???**). I argue that the constriants evident in the classes at a single point in time should predict how people change their attitudes over time. I test this propostion using data on religious, moral, and family-structure beliefs from the National Study of Youth and Religion. Latent class analysis identifies five belief systems. These systems vary in the number of beliefs they constrain and the degree to which they constrain beliefs. I show that the constraints evident in cross-sectional data at Wave 2 predict which attitudes people change between waves and how they change them better than competing models of attitude formation.

Third, I adjudicate the influence of these belief systems, organizational participation, and social network influence on the pattern of changes in attitudes over time. I show that belief systems observed at wave 2 better predict the pattern of attitude changes over time than models accounting for changing social circumstances.

The results have several implications. First, they suggest that beliefs are more structured than many theories posit, but not in the way that typical measures of constraint suggest. Second, they show that modeling beliefs as a multinomial draw from a belief space provides a good fit to the observed pattern of attitude behavior over time. Finally, these results show that social circumstances appear to be less influential in individuals' attitudes over time than the early imprinting they receive. It is not that organizations and social networks lack importance; it is that these influences matter strongly early in life and less later in life.

2   What Are Attitudes?

Understanding the empirical signature of a belief system must start with a model of the behavior of attitudes. A key finding from decades of work in cultural sociology and public opinion is that people consume diverse and contradictory bits of culture, often storing this heterogeneous mixture without taking time to reconcile its contraditions (Martin 2010; Swidler 1986; Zaller 1992). Without strong motivation to reconcile conflicts, people have a hard time keeping conflicting considerations out of their heads (Martin 2010; Zaller 1992). As a result, "our heads are full of images, opinions, and information, untagged as to truth value, to which we are inclined to attribute accuracy and plausibility" (DiMaggio 1997: p. 267). In their day-to-day lives, people have no trouble believing that "love is (1) a clear, all-or-nothing choice; (2) of a unique other; (3) made in defiance of social forces; and (4) permanently resolving the individual's destiny" while simultaneously believing that "(1) Real love is not sudden or certain … (2) There is no 'one true love' … (3) The kind of love that leads to marriage should not depend on irrational feeling in defiance of social convention … [and] (4) Love does not necessarily last forever" (Swidler 2001: pp. 113-114), despite the inherent contradictions in these sentiments.

This heterogeneity of considerations has consequences for opinion behavior over time. When asked to give an opinion on an issue, people seem to sample from the range of considerations stored in their heads, shaped by local influences such as question structure and wording, as well as recent stimuli such as discussions with peers or the news, and generate an opinion on the basis of these stored considerations and short-term influences (Swidler 2001; Zaller 1992). People with conflicting considerations do not simply pick scale midpoints (though they do this frequently), but they can range widely in their responses over time. This behavior is evident in interviews, where people tend to draw on diverse considerations to explain or justify behavior, often contradicting themselves (Swidler 1986, 2001). It is also evident in people's responses to the same survey question

over time, where they vascillate between ends of scales much more frequently than we would expect if they were stable opinion holders (Zaller 1992; Converse 1964).

At the same time, not all people display this level of ambivalence. On any particular question, some proportion of the population does clearly articulate the same opinions over time, with people varying on which issues they are stable (Converse 1964; Hill and Kriesi 2001). And social behaviors appear to affect attitude stability. In politics, people who pay more attention to political debates tend to be much more stable on their attitudes over time than people who do not (Converse 1964; Freeder, Lenz, and Turney 2019; Zaller 1992). Other work shows that the presence of cognitive authorities facilitates the structuring of attitudes over time as well (Martin 2002; Rawlings 2020). And work in cultural sociology suggests that attitudes can predict behaviors and patterns of affiliation over time (Vaisey 2009; Vaisey and Lizardo 2010), which we would not expect if attitudes were temporary constructs shaped by local circumstances. An intepretation of this over-time stability is that stable people have somehow constrained their consideration sets.

In general then, it is wrong to say that people have *an* attitude about something. What they have is a set of considerations that might point toward a single attitude or a set of considerations that might cause them to shift around in response to local changes. Any single response will be a draw from this consideration set with more or less random error shaped by personal circumstances. For example, consider a person who has the heterogeneous and conflicting models of love that Swidler (2001) recounts. When asked if unhappy couples should get divorced, this person could give either answer depending on which considerations are foremost in their mind. If something has triggered the prosaic model of love, the person might say that people should git divorced if they are unhappy. If something has recently triggered the romantic model of love, the person might oppose divorce. But we can also imagine a person whose cultural influces constrain them to oppose divorce, perhaps by making it a religious taboo. This person might be more likely to oppose divorce each time you ask them.

3   Sources Atttiude Structuring

If people encounter a heterogeneous mixture of culture and store most of it uncritically, how do we account for the fact that some people – exposed to the same heterogeneous mixture of culture – demonstrate remarkable consistency in their attitudes over time and the fact that that attitudes often predict behavior (Miles 2015; Vaisey 2014)? There are two principal explanations in sociology: one cultural, and one stuctural (DiMaggio 1997: p. 267).

The cultural explanation for attitude stability posits that people's attitudes are shaped by cognative stuctures called schema, "knowledge structures that represent objects or events and provide default assumptions about their characteristics, relationships, and entailments under conditions of incomplete information" [DiMaggio (1997); p. 269]. In cultural sociology, schema are conceptualized as connections of concepts, generated through repeated exposure, that shape how people process information. These relationships between concepts are often the principal goal of methods designed to measure (**???**; **???**; **???**).

Schema facilitate the interpretation and recall of information, shaping the belief patterns people exhibit over time (DiMaggio 1997; **???**; Hunzaker 2016).

While schema can be ideosyncratic, many are cultural, shaped by early socialization experiences. Under this framework, socializing institutions – churches, families, schools, etc. – are highly

important in shaping people's cognition early in life, but less influential in shaping thier cognition later in life.

In this framework, people demonstrate stable attitudes because their cultural-cognitive schema prevent the internalization of schema-inconsistent information and facilitate the recall of schema-consistent information (Hunzaker 2016; Hunzaker and Valentino 2019). A person who believes that God exists and has deemed divorce antithetical to eternal salvation is going to have an easier time answering a question about whether divorce is acceptable than someone who has internalized conflicting information about heterogeneous models of love. People become inconsistent in their responses when cognition is weakly schematized, preventing the rejection of heterogeneous information, and therefore leaving a concept connected to conflicting bits of culture (Martin 2010).

The principal alternative explanation for attitue stability argues that social structures – organizations and social networks – facilitate attitude stability throughout the life course. Under this framework, people's attitudes and beliefs are principally shaped by the dual process of social influence and homophily (DellaPosta, Shi, and Macy 2015) and by the scaffolding provided by organizational structures (Martin 2002; **???**).

In this framework, people maintain consistency because they consistently hear a single line of cultural reasoning and rarely hear heterogeneous infromation. Cognative leaders provide clear guidelines for what attitudes go together and organizational hierarchies make certain … (Martin 2002). Social interactions make some pairs of attitudes uncomfortable. People would be … if their institutional participation changed or if their social networks suddenly started introducing heterogeneous considerations.

To some extent, both these processes likely shape attitudes over time. Stability likely reflects a dynamic interplay between cognitive and social structures (Lizardo, n.d.; Martin 2010). And adjudicating the relative influence of these processes is difficult because people's cultural beliefs appear to shape thier social networks (Lizardo, n.d.; Lewis, n.d.; **???**) and their organizational participation.

But research in the social sciences has tended to favor the latter explanation, that social networks and organizations are the principal causes of stability over time. A key reason for this is because measuring cultural belief structures has proven difficult.

4 Measures of Attitude Structures

The most common approach to measuring belief structures in the social sciences focuses on the pairwise relationships between survey items in cross-sectional data, typically using covariance or correlation (Baldassarri and Gelman 2008; Boutyline and Vaisey 2017; Converse 1964; DellaPosta, Shi, and Macy 2015). Related measures designed to address measurement error in individual responses (Ansolabehere, Rodden, and Snyder 2008) still tend to look at the pairwise relationship between latent beliefs.

These correlational models rest on what I call the "diametric assumption" that beliefs are constrained when they covary across people, that people who are high on the first attitude are high on the second, while people who are low on the first attitude are low on the second. While this is good evidence for a static variation of constraint – that two issues tend to cluster in the population – it is not necessarily indicative of a cognitive connection in people's heads. Under this logic, if liberals and conservatives have opposite positions, then they are assumed to understand a link between them, even if they, in their own heads, do not. Similarly, if they do not have opposite positions, neither is

assumed to be constrained in their thinking, even if members of both groups subjectively understand their belief system to imply that position (the theoretical definition of the cognitive version of constraint). But there are often times when different belief systems constrain people to the same position in belief space. For example, all varities of American popular nationalism uncovered by Bonikowski and DiMaggio (2016) restrict people to some level of agreement that it is important for Americans to have American citizenship and some level of pride in the Armed Forces. No form of popular nationalism rejects these, saying that Americans should not have U.S. citizenship, but that does not make these unconstrained forms of thought.

A more recent development in schema measurement are relational and correlational class analysis methods, which attempt to partition people into groups that have similar patterns of relationships among beliefs, allowing for heterogeneous and non-oppositional belief systems in the same population (Goldberg 2011; Boutyline 2017). However, the diametric assumption still underlies interpretation of these methods. If people are located in opposite positions, researchers employing these methods assume that people see the same "logic" of a space, which might not be warranted. For example, Baladassarri and Goldberg assume that "a high-earning and secular Manhattan lawyer, squeezed by her progressive leanings on moral issues and her support for fiscal austerity" and "a working-class devout churchgoer torn between his moral conservatism and redistributive economic interests" see politics through the same logic, though this might not be true (**???** p. 46). In fact it is hard to imagine that these people see political conflict as an opposition between "libertarian" thought on one hand and "populist" thought on the other, when the main political parties align orthogonal to this axis. What is more plausible is that these peoples views are simply unconstrained by the liberal-conservative paradigm, not a separate belief structure.

There are three other major challenges with these approaches. First, as discussed above, if we think of attitudes expressed in surveys and interviews as manifestations of the bredth of considerations people have available to them in their heads, rather than stable dispositions that they carry with them over time, belief systems as networks of connections between survey responses becomes hard to justify. In any survey wave, people might be presenting one of several answers that does not truly reflect the bredth of their considerations, which is a key component of people's cognition. A feature of a belief system might be that it does not constrain an attitude.

Second, these approaches all fail to connect the methodological implication of belief structuring with the core theoretical implication that they highly. These authors all repeatedly invoke the imagery of movement to explain what constraint is (emphasis added in all):

- "However, these beliefs are still tightly connected, in that *movement* in one implies *movement* in the other" (Martin 2002: p. 868). "Tightness, as defined above, can be interpreted as the imposition of *rules of movement* within the belief space (think of the difference between the constrained motion of driving on surface streets and the unconstrained motion of four-wheeling on the beach). Consensus, on the other hand, can be interpreted as a gross *inability to move away from* some privileged areas of the belief space toward others (without channeling in particular directions whatever degree of *motion* is allowed)" (Martin 2002: p. 874).

- "we might best see the distribution of people in this space as giving us clues about the *rules of motion* in the belief space. If one were to take a picture of some well populated area from a low-orbiting satellite, and marked a spot wherever there was a car, one would be able to figure out rather well where the roads were, and where cars were allowed to go. It is these analogous *rules of movement* that will give us clues as to the nature of social cognition" (J. L. Martin 2000: p. 11).

- "Culture, in this context, can be understood as the unspoken set of rules that tie beliefs together by restricting *movement* in this space along certain axes, which demarcate different social worlds" (Goldberg 2011: p. 1403).
- "We therefore interpret different *axes of movement in a belief space* … as the empirical signature of ideological constraint" (Baldassarri and Goldberg 2014: 59).
- "attitudes toward science and religion *move* in tandem" (DiMaggio et al. 2018: p. 40).

These researchers understand constraint to be a dynamic phenomenon, but in these studies dynamics are inferred from a snapshot and, importantly, not tested over time. Because people are arrayed along a diagonal in belief space, they are assumed to only travel along this diagonal (Martin 2002; Baldassarri and Goldberg 2014). Because people are clustered in portions of the belief space, they are assumed not to move from one cluster to another. These are not unreasonable assumptions, but they are assumptions.

Finally, because these measures of belief systems do not make clear predictions for the behavior of attitudes over time, it is hard to assess their validity. While they identify structuring of the population over time, they do not truly make predictions for how attitudes will change over time, especially in the absence of knowledge about people's *other* beliefs at time 2. If a person changes between two time points, it is unclear if that change is compatible with belief system.

5   Rethinking Belief Structures

Taking as a starting point the idea that observed attitudes are reflections of a range of considerations that people internalize, observed with error, then deducting belief systems from single obscerations.

Instead, cultural belief systems should be thought of as sets of influences that shape the range of considerations that people internalize and draw from over time. A system might shape people's considerations by directly providing considerations ("marriage is good"); by linking certain considerations together ("god exists says that marriage is important for eternal salvation"); or by linking beliefs to social groups ("getting married is an important part of being a member of this community"). In doing these things, belief systems shape the range of messages people receive; the degree to which they reject messages they receive; and their ability to recall considerations over time.

Belief systems should reflect "some process whereby the arbitrary movement of individuals in this space has been reined in; more exactly, it may be thought of as the most general introduction of form to an otherwise formless distribution" (J. K. Martin, Pescosolido, and Tuch 2000: p. 865).

Figure XXX presents two hypothetical belief systems on two questions. The first is a highly constrained belief system that constrains people to believing in God and rejecting divorce, either because a person cognatively links these concepts or because they hear both messages frequently from organizations (such as a church) . The second belief system is less constrained. People in this group internalize heterogeneous messages on both dimensions and, as a result, should vacillate on both questions over time.

```r
data.frame(q = c(rep("God exists?", 4), rep("Divorce OK?", 4)),
          group = c(1,1,2,2,1,1,2,2),
          resp = rep(c("Yes", "No"), 4),
          prob = c(.9, .1, .5, .5, .1, .9, .5, .5)) %>%
  ggplot(aes(x = q, y = prob, fill = resp)) +
```

```
geom_bar(stat = "identity", position = "stack", color = "black") +
facet_wrap(~group) +
theme_minimal() +
labs(x = "", y = "", fill = "Response")
```
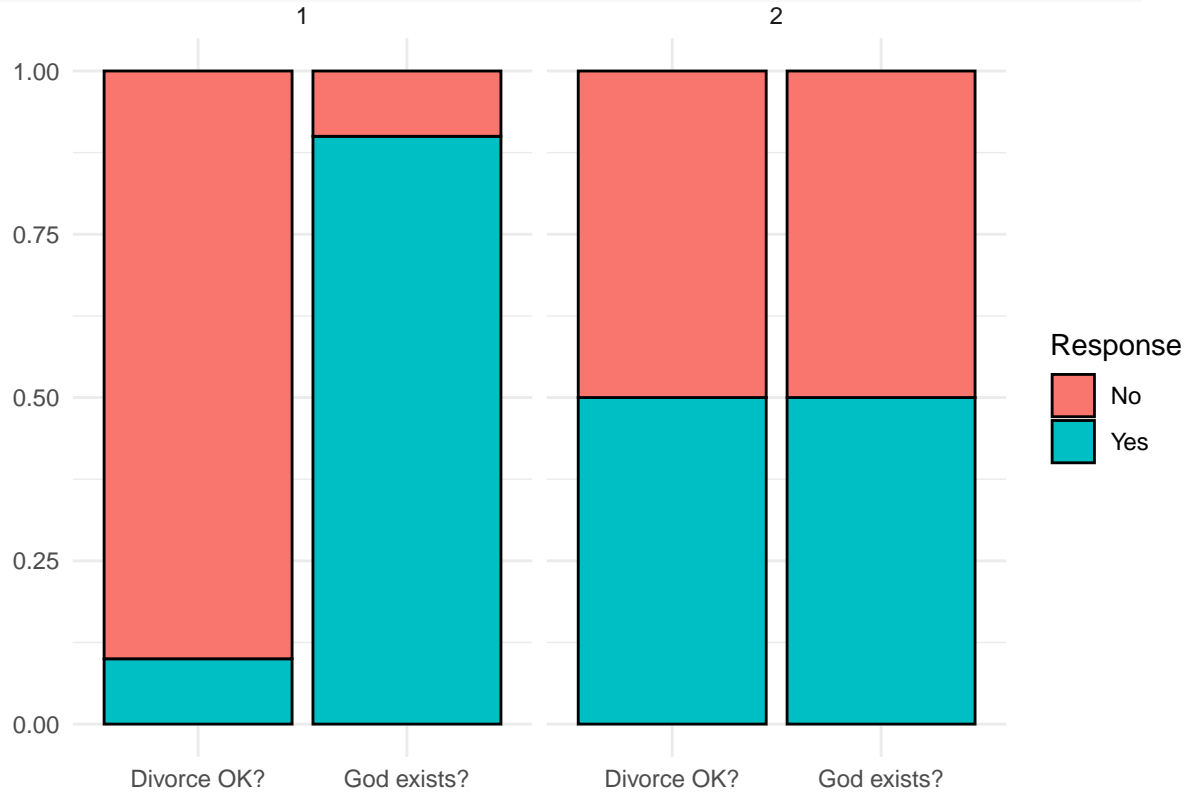

This example show the challenges of using the pairwise relationship between questions at a single point in time to deduce belief systems. While most members of the first might be readily identified, members of the second could result in four equally likely response patterns in a single wave.

Under this framework, even taking a person's average response to a question over time seems insufficient, since it sacrifices varianace. A person who consistently selects a scale midpoint is likely very different from a person who selects from the full range over time, even if both demonstrate the same average over time.

The obvious challenge of this approach is that we do not frequently observe people's responses to the same question repeatedly over time, with many panels of attitudes stopping at three waves.

In this framework, the presence of a cultural belief system will observable if we observe groups of people who have the same probability of answering a question in a particular way. Such a method exists and has been used in sociological studies of attitude sturcturing before (Bonikowski and DiMaggio 2016; DiMaggio et al. 2018).

6 Latent Class Analysis and Belief Systems

Latent Class Analysis is a data-reduction methods that seeks to group people who, once grouped, are ass. The fundamental assumption of latent class analysis, the conditional independence assumption, assumes that once the latent class is identified, each person's response on a particular question is an independent draw from the probabilites of the different responses observed within that group. This …

6.1 Hypotheses

6.1.1 Latent Class as a Measure of Belief System

Understanding belief structures as cultural structures that constrain (or do not constrian) people's consideration sets gives us clear expectations for relationship between belief systems and change over time. The preceeding discussion suggests an empirical signature of the cognitive variant of constraint should be a structure to the movement of beliefs over time, or a constraint of ideas to certain portions of the belief space. When people view attitudes as linked, holding one of them stable limits the degree to which another can be changed. It does not control how a person moves; it controls when he does not move. The preceeding discussion gives us a set of expectations for how we should expect constrained beliefs to behave.

Hypothesis 1: Within belief systems, beliefs that are more constrained will demonstrate less change over time than less constrained beliefs.

Hypothesis 2: Across belief systems, the same belief will show less movement over time if it is in a more constrained belief system.

The model outlined above suggests that the belief system at wave 2 should only predict the degree to which attitudes in any particular system will change, but also *how* people in these belief systems will change over time. The central assertion is that responses at a particular wave should be conceptualized as independent draws from the deduced multinomial distribution. This distribution is shaped by broad culture forces, but which specific response a person gives at any wave will be shaped by (random) local influences. This means that while it will be very hard to predict what any particular person will say in each wave, assuming these draws are independent can give us strong predictions for the overall count of observed patterns over time.

Hypothesis 3:

6.1.2 Adjudicating Culture and Structure

Assuming that the latent class , and that the preceeding hypotheses are proven correct, identification of the belief system through latent class analysis allows for adjudication of the competing influences of belief systems, organizational structures, and social networks.

Hypothesis 4: Belief systems will better predict people's observed changes better than models using changing social circumstances over time.

7 Data and Measures

7.1 The National Study of Youth and Religion

Data for this analysis comes principally from waves two through four of the National Study of Youth and Religion, a four-wave panel data set of adolescents that began when respondents were between the ages of 13 and 17 and surveyed them every three or four years for four waves. In wave 2, respondents were between 16 and 20, and in wave 3 respondents were between 17 and 24.

7.2 Measures

7.2.1 Beliefs

In waves 2 through four, NSYR respondents were asked a series of questions about their religious, moral, and family-structure beliefs. These variables are outlined in Table . They include seven questions asking about specific religious beliefs, four questions asking about morality and the role of religion in daily life, and six questions about gender relations and family structures.[1] These questions are asked on either three-point scales of "yes," "maybe," and "no," or five-point scales of "strongly agree," "agree," "undecided/don't know,"[^dk] "disagree," "strongly disagree."

  To make the variance of responses to each question comparable, I scale all atttiude measures to five-point scales between 1 and 5 by converting questions on three point scales: "yes" to 1, "maybe" to 3, and "no" to 5.

7.2.2 Covariates

I examine three principal sources of attitude structuring: sociodemographics, organizational participation, and social networks. These covariates are used … and

  A second set of covariates is designed to tap organizational participation. I focus on two types of organizations: religious organizations and formal education. Given the role of religious organizations in shaping the attitudes under examination here, I include a set of dummies for the respondents' religious tradition and a measure of church attendance. I also include a variable measuring the number of years of education a person has received above ninth grade.

  Finally, to measure social network influence, I include the proportion of a respondents' friends that share that person's religious orientation, including no relious orientation for people who do not express one.[2]

7.3 Belief Systems

I use Latent Class Analysis to deduce belief systems using the 19 attitude items asked at wave 2. Latent Class Analysis partitions

$$P(Y = y) = \sum_j P(K = j)P(Y = y|K = j)$$

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[1] While I would have liked to include the question Vaisey (2009) uses to predict adolescent behavior over time, because of a coding error, responses to that question were lost for most respondents at Wave 3.

[2] Almost all respondents at wave 2 said they had five close friends.

The LCA model estimates the relative class proportions, $P(K)$

7.4 Testing Hypotheses

7.4.1 Change Over Time

The first two hypotheses make predictions about how much attitudes should change over time as a function of the constraint within a belief system at a single point in time.

I measure constriant of a particular attitude by looking at the within-group standard deviation of responses to that attitude.

$$\sigma_{jk} = \sqrt{\frac{\sum (x_{ijk} - \mu_{jk})^2}{N_k - 1}}$$

I capture a person's change over time by simply taking that absolute differences of their responses at wave 3 minus their responses at time 2.

$$\delta_{ij} = |J_{i,t=3} - J_{i,t=2}|$$

I test the first and second hypothesis using a single linear regression of absolute within-person change between waves on the within-class standard deviation at wave 2, with fixed effects for question and for person. This amounts to simultaneously testing whether people exhibit more change in their less constrained beliefs than their more-constrained beliefs and whether a belief demonstrates more over-time change when it is in a less constrained belief system than when it is in a more constrained belief system.

$$\delta_{ij} = \sigma_{jk} + \mu_i + \mu_j + \epsilon_{ij}$$

7.5 Pattern Prediction

Hypotheses 3 and 4 focus on the observed counts of change patterns over time. For example, assume two belief systems that differently constrain people's views on the following question: "Do you think that, in general, a couple without children should end their marriage if it is empty and unfulfilling, or should they stick with it even if they are not happy?" In one belief system, people are constrained to oppose divorce quite strongly ($Pr(yes) = .9$). These people have many considerations against marriage, but there's a chance that a local event could tip their disposition either way at any particular wave. In the second belief system, people have roughly equal considerations in favor of and opposed to divorce ($Pr(yes) = .5$). They have considerations telling them that people should stay together, and considerations telling them that people should divorce. And which response they give at a particular wave will be affected by the balance of considerations on their mind at any time.

If a person's response at wave is an independent draw from these their consideration set, then people in the first group should say "yes" in both waves about 81 percent of the time ($.9 * .9 = .81$). People in the second group should say "yes" in both waves about 25 percent of the time ($.5 * .5 = .25$). We can calculate the probability of each of the four possible two-wave response patterns, presented below:

Pattern	$Pr(yes) = .9$	$Pr(yes) = .5$
Yes -> Yes	.81	.25
Yes -> No	.09	.25
No -> Yes	.09	.25
No -> No	.01	.25

We could use the distribution of these two belief systems in the population, as well as the distribution of responses observed at wave 2, to generate a range of plausible predictions for the number of each pattern we observe in the data set. We could then compare whether this theoretical process does a better job predicting the count of observed changes over time than other theoretical models, such as a model that predicts that people give the exact same response in wave 3 that they gave in wave 2 or one that predicts that people sample randomly from the full belief system with equal probability. These are implausible models, but we can outline more theoretically grounded alternatives.

The clearest theoretically grounded alternative explanation would suggest that people have more or less ideosyncratic belief systems (or sets of considerations) as a function of their social experiences. Under this framework, there should be no systematic relationship between beliefs. Instead, people would receive separate influences on each belief from their social environemnts – churches, schools, families, friends, etc. – and these would shape their responses at each wave.

7.6   Changing Circumstances

To this point, hypothesis testing has been oriented toward establishing that latent class analysis provides a good methodological fit for the theoretical concept of a belief system and the predictions it makes over time.

An extension would be to compare the predictions of the belief system derived at the first wave to predictions that accounts for changing social circumstances, specifically changes in organizational participation and changes in social networks.

I do this in two ways.

Giuven …. changes between waves – changes in Church attendance, educational attainment, social networks, family relationships, etc. – should produce changes in attitudes.

I test the influence of changing social circumstances … In the first, I use the …

In the second, I use …

All four models use all people with full beliefs at wave 2 and observed covarates at waves 2 and 3.

7.7   Testing Hypotheses

While the… that …., they do not show that belief systems confine people to particular responses. If my theory of belief systems is …, then it should be the case that people's responses at wave 3 reflect a multinomal draw from the posterior distribution generated from the data at wave 2.

A final … is whether it is belief structures or organizational participation that faciltiates the stability of attitudes over time. One model suggests that once people have internalized a belief system, it govens their behavior, including their movement into contexts []. In this context, a person's belief system not only constrains his movement in belief space, but it also shapes their movement

across organizational contexts. A second model argues that changing orgnaizational settings can have profound effects.

To test this, I test a variety of … … to predict people's responses at wave 3 as a function of .

The first model assumes that people's responses at time … are.. … The second model assumes that people's responses at wave 3 are a multinomial draw from the probability of each response at time 2. I do not …, but they provide a …

The third model predicts people's responses at time 3 as a function of their within-group probabilities at time 2.

The final model uses data on organizational participation to estimate both which belief system people enact and their response patterns.

All three models assume that belief systems do not change fundamentally over time.

7.7.1 LCA

Belief systems … vary in two principal dimensions: which attitudes they constrain and how strongly they constrain these views. We can imagine a … that attempts to constrain beliefs across a wide range of attitudes, including religion, morality, and … A second belief system, perhaps associated with mainline protestant organizations, might principally constrain views on religion, while providing few constraints on views about morality or the family.

8 Results

The results proceed in three parts. First, I deduce and exlain the belief systems identified through latent class analysis. Second, I test the proposition that … is a good predictor of over-time change. Third, I adjudicate the competing influences … in predicting wave 3 responses.

8.1 Belief Systems

Based on goodness of fit measures and substantive interpretability, I selected and present a five-class model to summarize the belief systems across the three domains outlined above. Figure ### presents the expected probability of each response option for all 19 questions for all of the classes.

I briefly summarize each belief system, giving a substantive interpretation based on response probabilities and covariates.

Ardents: This group demonstrates the most strongly constrained religious beliefs. Almost everybody in this class expresses a belief in the major tenets of Christian theology, and they uniformly reject non-Christian beliefs (reincarnation and astrology). They strongly contrast with other classes in disagreeing and strongly disagreeing with moral relativism and the notion that religion is a private matter. Identification as an Evangelical Christian is a strong predictor of being in this class, as is frequent attendance at religious services. This group comprises about 13 percent of respondents.

0.1262 0.3066 0.1388 0.1871 0.2414

A key feature of this class is that they are less constrained in their beliefs about family and gender than many of the other classes. They are less constrained because the belief space is broader than most other classes; their belief system is presenting them considerations that are at odds with the prevailing culture. While most other groups are constrained to the "disagree" side of the scale

on whether "Most of the important decisions in the life of the family should be made by the man of the house," members of this group occasionally agree or strongly agree. They are also the group most likely to say that divorce and sex before marriage are not acceptable.

Agnostics: The second class i group … They either reject or question the principal components of Christian theology. At the same time, they also reject astrology and reincarnation. In fact, they look most similar to the most constrained religious group on these two issues. They are the most constrained to the "relative" side of the moral relativism-moral absolutism scales. They tend not to identify as identify with a religious denomination or attend religious services. However, people who identify as Jewish also strongly cluster in this group. This group comprises about 19 percent of respondents.

Ambivalents: The thid group is characterized by a high degree of uncertainty on religious and moral beliefs. They are the most likely to say they don't know in response to questions about the existence of agnels, demons, and , as well as non-christian elements such as astrology and reincarnation. These respondents tend to be Catholic or unaffiliated with a religious tradition.

Mainline: Group … has relatively constrianed views on religion – similar to the first group – but demonstrates more relativist moral views and more progressive views on family structures and gender roles.

Torn: This group has clear religious beliefs, but differ from the first group in being more moderate in their moral views and their views on family. Members of this group appear torn between their religious commitments and contemprary American society, or at least … This is the largest class in the data set, drawing members from all religious groups, principally people who do not attend religious services frequently.

8.2   Over-Time Change

I now turn to exploring whether, as predicted, group heteogeneity at wave 2 predicts change over time.

Figure … plots the average within-class standard deviation at wave 2 against the average within-person change between waves 2 and 3. There is an incredibly strong relationship between the amount that a particular question varies within a group at time 2 and the average within-person change that members of that group demonstrate between the two waves ($\rho = .86$). This relationship holds within groups (lowest correlation is .566 for group … ; highest correlation is .880 for group …) and within questions (lowest correlation is 0.557 for belief in the afterlife; highest correlation is 0.991 for whether God created the world).

```
t %>%
  group_by(group, question, grp.var) %>%
  summarise(abs_diff = mean(abs_diff, na.rm = TRUE)) %>%
  ggplot(aes(x = grp.var, y = abs_diff, fill = as.factor(group))) +
  geom_point(shape = 21) +
  geom_text_repel(aes(label = question), size = 2) +
  labs(x = "Within-Class S.D., wave 2",
      y = "Avg. Within-Person Change between Wave 2 and 3",
      fill = "Class") +
  theme_minimal()
```

To test hypotheses 1 and 2, I estimate a regression of within-person change between times 2 and 3 on within-group variance at time 2. Table XXX presents the results of that regression.

As expected, Table ### shows a strong positive association between within-group variance at wave 2 and within-person change at wave 3. In other words, consistent with Hypothesis ### people are more likely to change attitudes that are less constrained in their group at time 2. And within questions, groups that are less constrained exhibit more change their answers over time.

8.3 Response Patterns

While the regression above presents strong evidence that people are more likely to change their less constrained beliefs and that beliefs change less in more constrained belief systems, the belief structure model outlined above actually makes stronger predictions: that constraints not only predict how much responses will change, but which responses members of each belief system will give over time.

I use … the probabilities of class assignment estiamted at wave 2 to generate , and use those class assignment to generate expected responses at wave 3.

… 10,000 iterations of each model.

8.3.1 Changing Social Circumstances

Finally, I adjudicate between the competing influences of belief systems and social structures in predicting change over time.

If … principally a manifestation of social structures, then changes … will matter in predicting …

9 Discussion

10 Conclusion

An important caveat to the above presentation is that Wave 2 of the NSYR occurs at what seems to be a particularly formative period in people's life course. Respondents were between the ages of 16 and 20 when they were interviewed for wave 2 of the NSYR. Existing research suggests that people's attitudes on a range of issues appear to crystalize prior to adulthood (Kiley and Vaisey 2020; ???; Vaisey and Miles 2017). It might not always be the case that the first wave of a panel survey is as strongly predictive for each belief system.

There are two general reasons why we should expect constrained beliefs to demonstrate greater stability. First, people with constrained beliefs will demonstrate less change in their social contexts. Strong belief systems guide people's behavior across domains, including the networks people select into, the institutions in which they choose to participate, and more (???). Heterogeneous belief systems allow people to draw on different considerations when constructing (???).

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