Was There a Culture War? Partisan Polarization and Secular Trends in U.S. Public Opinion*

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According to many scholars of public opinion, most of the fast-growing divide between Democrats and Republicans over the last few decades has taken place on moral issues. We find that the process of issue partisanship—the sorting of political preferences along partisan lines—properly accounts for public opinion dynamics in the economic and civil rights domains. However, when it comes to moral issues, the prominent change is a partisan secular trend, in which both Democrats and Republicans are adopting more progressive views, although at a different rate. While Democrats are early adopters of progressive views, Republicans adopt the same views at a slower pace. This secular change can be easily (mis)interpreted as a sign of polarization because, at the onset of the process, the gap between party supporters broadens due to the faster pace at which Democrats adopt progressive views, and only toward the end, the gap between partisan supporters decreases.

Keywords: secular trends, partisan polarization, US public opinion, moral issues, culture war

Over the last 20 years, research on trends in U.S. public opinion has largely focused on whether the U.S. public has become more polarized (DiMaggio et al. 1996; Fiorina et al. 2005; Bafumi and Shapiro 2009; Abramowitz and Saunders 2008; Levendusky 2009; Baldassarri and Gelman 2008; Layman et al. 2006; Hetherington 2001). Among the things pointing in this direction, there was the increased polarization of parties in Congress (Poole and Rosenthal 2011; McCarty et al. 2006; Layman et al. 2010), as well as the narrative of 'cultural wars' that became common among politicians and pundits in the mid-90s (Hunter 1991; Bishop 2008), leading some to believe that moral issues were trumping economic interests in voter decisions (Frank 2004). Although most of the claims advanced by 'cultural war' advocates were overly dramatic, there is no doubt that moral issues have taken center stage in American politics over the last few decades, and that debates on abortion and gay rights have contributed to the perception of a deeply divided country (Hetherington 2009; Jacoby 2014).

Scholarly research has repeatedly documented the growing division between Democrats and Republicans on a wide range of issues (DiMaggio et al. 1996; Fiorina et al. 2005; Levendusky 2009; Baldassarri and Gelman 2008; Park 2018). Indeed, divisions along partisan lines were already visible in the economic and civil rights domains from the early 1970s, and they have increased since then. Most notable, how-

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ever, has been the dramatic sorting along partisan lines that has occurred on moral issues. Although economic issues still remain the most divisive (Bartels 2008, 2006; Hout et al. 1995), the political salience of moral concerns has certainly increased, along with their capacity to split the electorate. Similarly, moral considerations now factor in voters' choice, and in subgroups of the population may indeed be predominant (Baldassarri and Goldberg 2014; Greeley and Hout 2006). In sum, growing divisions on moral issues have been described as one of the most significant changes in public opinion over the last decades.

Absent from this debate, however, have been considerations concerning the secularization process that often characterizes long-term opinion change, especially in the moral domain. For instance, analyzing trends in public opinion over the last century, Fischer (1978) and Fischer and Hout (2006) have shown a dramatic change in a host of social and moral issues, including gender roles, divorce, alcohol and marijuana consumption, racial tolerance, etc. In all these cases, public opinion as a whole has moved toward more liberal views.

Secularization may be brought about by demographic replacement over extended periods of time. Younger and more progressive generations replacing older and more conservative ones is an example of such a process. Quite often, however, opinion change is also triggered by social diffusion dynamics, that rely on media, opinion leaders, or network influence. In such cases, change occurs more quickly and, most importantly, rates of opinion adoption follow an S-shaped curve typical of phenomena in which actor's decisions are interdependent (Coleman et al. 1957; Rogers 1995; Young 2009). Namely, adoption of progressive views is slow at first, and then takes off as novel opinions diffuse among the population. Although with the survey data at our disposal we cannot fully investigate the specific micro-level dynamics that underly this secularization process, we are in the position of documenting the macro-level trend. Importantly, under certain circumstances which will be discussed later, this secular trend may be erroneously interpreted as an instance of partisan polarization.

In light of these considerations, and taking advantage of a few extra years of data, we build on previous scholarship on trends in public opinion and revisit some of its conclusions. Contrary to previous accounts, we argue that the social process that brought about opinion change in the moral domain over the last four decades is substantively different from what has occurred in other issue domains. We consider two principal mechanisms of opinion change: *issue partisanship*, i.e., the sorting of political preferences along partisan lines which results, on average, in Democrats becoming more liberal and Republicans more conservative, and *secular trends*, which usually take the form of a collective movement toward more progressive positions. Although these two mechanisms do not exhaust the realm of theoretical possibilities for opinion change, they do constitute the most plausible ones in describing recent developments in public opinion, and, for sake of parsimony, we limit our analysis to them.

We find that public opinion dynamics on economic and civil rights issues can be satisfactorily accounted for in terms of issue partisanship. However, when it comes to a large range of moral issues, the underlying process is typical of secular trends: the entire population is moving toward more progressive views on a host of issues, from gay rights, to gender roles, sexual behavior, and the legalization of marijuana. In particular, this is a *partisan secular trend*, in which Democrats are leading the pack, adopting progressive views earlier, while Republicans adopt the same progressive views at a slower pace first, only to eventually catch up later on, at least on some of them. The different pace at which Democrats and Republicans adopt liberal views has the interesting consequence that, at the onset of the process, the gap between the parties broadens due to the faster pace at which Democrats adopt progressive views, and only toward the end this gap decreases. This is why scholars can easily misinterpret this secular change as a sign of political polarization: in contrast, the observed partisan division on moral issues is likely the by-product of the different pace at which Democrats and Republicans are adopting *similar*, more secular views.

Issue partisanship

The U.S. political elite has become more polarized over the last forty years. Moderate members of Congress have all but disappeared, leaving the floor to highly partisan representatives aligned at the opposite ends of the liberal-conservative spectrum (Poole and Rosenthal 2011; McCarty et al. 2006). Similarly, political candidates and party activists have become more extreme in their policy agendas and political views (Layman et al. 2006, 2010; Hetherington 2009). Although measured in multiple ways, elite polarization is generally conceived and documented in terms of increased extremism or a movement from a bell-shaped opinion distribution to a bimodal one.

When looking at public opinion polarization in similar terms by considering, for instance, whether the distribution of issue preferences in the electorate has moved from a normal to a bimodal distribution, the conclusion is that American public opinion over the last half century has remained stable or even become more moderate on a large set of political issues (DiMaggio et al. 1996; Evans 2003; Fiorina et al. 2005; Park 2018). However, other changes have occurred in the mass public: if we compare trends across partisan subgroups, Democrats and Republicans have increasingly grown apart on a large set of political attitudes, including economic, civil rights, moral, and even some foreign policy issues (DiMaggio et al. 1996; Evans 2003; Fiorina and Abrams 2008; Bafumi and Shapiro 2009; Abramowitz and Saunders 2008; Levendusky 2009). We refer to this process as issue partisanship.

The way in which scholars interpret this empirical evidence is at the basis of their persistent disagreement over how, and to what extent, ordinary citizens have responded to the polarization of the political elite. Vir-

[1]Issue partisanship has been also termed between-population polarization (DiMaggio et al. 1996), partisan sorting (Fiorina and Abrams 2008; Levendusky 2009), partisan polarization (Abramowitz and Saunders 2008), or

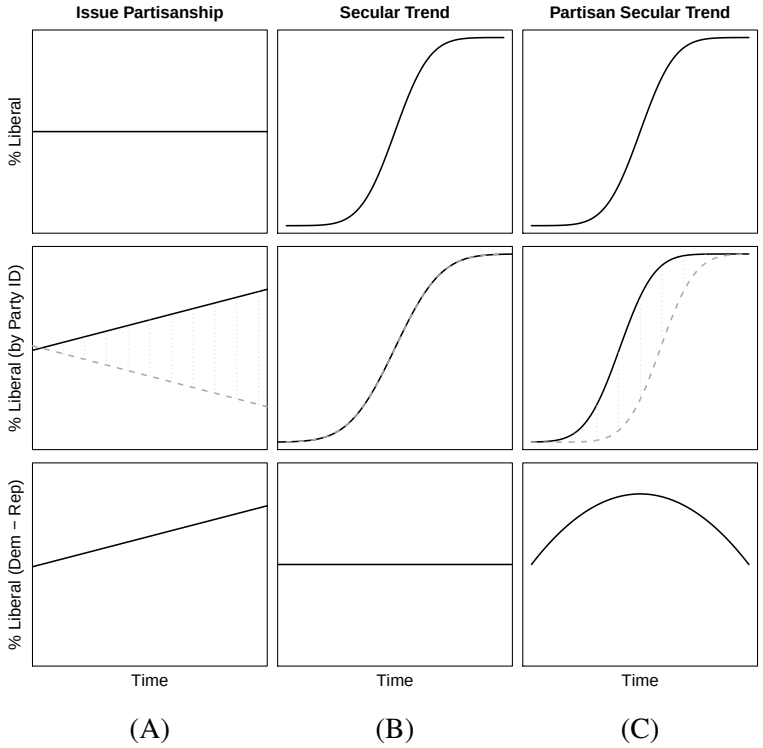
tually all scholars acknowledge the process of issue partisanship:[1] voters' attitudes have become increasingly consistent with party ideology. A majority of scholars interprets this as evidence of partisan sorting (Fiorina and Abrams 2008; Levendusky 2009; Hetherington 2009; Baldassarri and Gelman 2008; Park 2018): Elite polarization has made it easier for ordinary citizens to see the differences between parties, and therefore citizens are now better at sorting themselves along party lines. However, for others, the broad partisan divide should be interpreted as a sign of mass polarization. In their view, citizens (or a subgroup of them) have themselves changed and moral issues have lined up with economic and civil rights issues to substantially radicalize people's preferences and boost their partisanship (Abramowitz 2010; Bafumi and Shapiro 2009; Layman and Carsey 2002; Abramowitz and Saunders 2008). We are not concerned with taking sides in this debate here. Rather, we take stock of the literature on public opinion polarization and recognize issue partisanship as a major trend of interest.

To get a sense of how issue partisanship manifests itself, consider the following example. According to ANES data, the proportion of the public agreeing that the government should make sure that every one has a job and a good standard of living has not changed much over the last 30 years. On average, about 32 percent of the US public supported the idea both in 1972 and 2016. However, over time the partisan subgroups have diverged significantly over the issue. In 1972, 39% of Democrats and 20% Republicans were in support, while by 2012 the figures were 47% for Democrats and only 13% for Republicans (see the trend for guar.jobs.n.income in Figure 3).

In general, as represented in the first column of Figure 1.A, when sorting along partisan lines occurs we will observe issue stability in the overall population (Figure 1.A, 1st row) but diverging trends in the party subpopulations (Figure 1.A, 2nd row), and thus a growing difference between Democrats and Republicans (Figure 1.A, 3rd row). For sake of simplicity, we generically refer to this process as issue partisanship, and represent it as a symmetric process. This process, however, can also be asymmetric, with partisan alignment occurring only within one partisan group. For instance, Brooks and Manza (2013) find that, after the Great Recession, support for government regulation of the economy declined steeply among Republicans, while it remained essentially stable among Democrats. Similarly, Ura and Ellis (2012) document asymmetric partisan polarization in domestic spending. Although we do not display all possible variants of issue partisanship in Figure 1, we will consider them in our analysis. Finally, it should be mentioned that sorting along partisan lines may occur because of increased political extremism. However, as discussed previously, the distribution of political opinions has not changed toward greater bipolarity, and thus this possibility is not relevant for the current analysis.

party polarization (Layman et al. 2006) in the literature.

Figure 1: Hypothetical Trends in Public Opinion



Notes: Plots report opinion trends on a political issue. The 1st row reports the overall proportion of liberal responses, the 2nd row reports the proportion of liberal respondents among Democrats (solid line) and Republicans (dashed line), and the 3rd row reports the difference in the proportion of liberal respondents between Democrats and Republicans.

Secular Trends

When analyzing long-term trends in public opinion, we should also consider opinion changes that are brought about by a collective movement in a single direction. Historically, in Western societies, these changes often take the form of secularization processes, in which the entire population moves toward more progressive positions (Fischer and Hout 2006). This type of secular changes may simply occur because of demographic shifts. For instance, younger generations are more progressive on certain issues; as older generations are replaced, we would see the overall population become more progressive. Alternatively, immigration patterns or differential reproductive rates may make the distinctive political views of certain ethnic or religious groups more prominent in a population. Usually, secular trends based exclusively on demographic shifts unfold over a relatively long period of time, and the popularity of new ideas grows according to an approximately linear trend.

Often, however, secular changes are "boosted" by *social diffusion processes* (Figure 1.B). The signature of such processes is a S-shaped adoption curve, in which the rate of novel adoption (i.e., the proportion of individuals with progressive views) is low at the beginning, and then experiences a steep increase, as the number of new adopters increases. This steep increase, thus the S-shaped curve, is due to some sort of social influence: "new adopters" are not only

driven by their own underlying propensities, but also, via exposure to media, opinion leaders or interpersonal contact, and by the proportion of other people who have already adopted the innovation (Coleman et al. 1957; Rogers 1995; Strang and Soule 1997; Wejnert 2002; Young 2009). In particular, Young (2009) shows convincingly that if subgroups of a population adopt a new idea independently but at different rates, the aggregate adoption curve will not be S-shaped, *regardless of* the amount of heterogeneity in adoption rates across subgroups (p. 1902).[2] In contrast, the S-shaped curve and, in particular, the exponential growth at the start of the process, is observable only if a feedback loop exists between early adopters of the new idea and the incentives of non-adopters to follow suit; in other words, only in situations where adoption decisions are interdependent.[3]

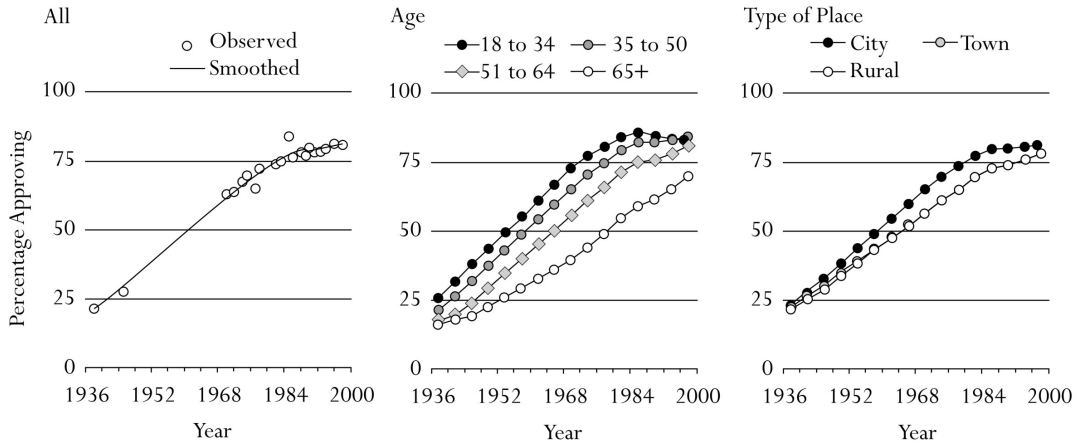
Traditionally, the literature has distinguished between innovators, early adopters, early majority, late majority, and laggards according to the time point at which individuals adopt new ideas (Rogers 1995; Strang and Soule 1997; Wejnert 2002). In the case of political opinions, scholars have shown that adoption rates often differ across sociodemographic subgroups: the adoption of new ideas often spreads from urban to rural areas, with urban dwellers being overrepresented among innovators and early adopters of liberal views (Fischer 1978). Other relevant categories are age and education, with younger and more educated people being more likely to adopt progressive views earlier (Fischer and Hout 2006).

This aspect is captured analytically by plotting adoption curves within population subgroups: lagged curves indicate different trends in the rate of adoption. For instance, in their seminal analysis of changes in public opinion over the last century, Fischer and Hout (2006) document the trend in approval of married women working for pay from 1936 to 2000 as reproduced in Figure 2. The unusually wide temporal window makes it possible to uncover the S-shaped nature of the change. Moreover, subgroup analyses show lagged curves for both age and urbanization: younger people and urbanites started to approve of working women earlier than their older and small town counterparts. Similar results were found for other issues related to gender roles, such as whether respondents were willing to vote for a woman for president, and racial and religious tolerance, asking whether respondents were willing to vote for a Jewish, Catholic, or Black candidate for president and support interracial marriage. In general, the authors conclude that "younger, northern, more-educated, and more urban Americans typically adopted new cultural positions first and that older, southern, less-educated, and less-urban Americans did so later." (Fischer and Hout 2006, p. 223). Of course, not all issues followed the same pattern. Impor-

[2]Groups with higher adoption rates will support the new idea earlier in the process, so that the average adoption rate in the population is strictly decreasing over time. Hence, at every moment of the process, the number of new adopters will be decreasing, which leads to an adoption curve that is strictly concave.

[3]In addition to the empirical evidence documenting this process in a variety of domains, formal treatments of diffusion processes and the related S-shaped adoption curves can be found in the classical sociology and marketing literature (e.g., Coleman 1964; Bass 1969) as well as more recent discussions by economists (e.g., Jackson 2010, Ch 7; Young 2009).

Figure 2: Approval of Married Woman Working for Pay, by Year, Age, and Type of Place



Notes: 1) Reproduced from Fischer and Hout (2006: p. 219, Figure 9.2) 2) Analyzed data come from Gallup polls and the GSS. 3) Data are smoothed using locally estimated (loess) regression.

tant exceptions in their analysis were abortion and support of the death penalty.

Partisan Secular Trends

While in the comprehensive analysis of Fischer and Hout (2006) the diffusion process is triggered by urbanites, well-educated, and youngsters, here we advance the hypothesis that, in more recent years, partisanship has played an important role in fueling the diffusion process, with Democrats disproportionally filling the ranks of innovators and early adopters.

The diffusion of novel, more secular views may have occurred disproportionately among Democrats at first through various mechanisms, including partisan media exposure and interpersonal relations. Undoubtedly, liberal media and cultural organizations have contributed over the years to promote and broadcast more progressive mores, especially regarding gender roles, sexuality, alternative life-styles etc. In addition, as documented by a large scholarship, diffusion processes are strongly influenced by patterns of interpersonal relations, and political partisanship is known to shape these patterns. To start with, political discussion networks tend to be homogenous (Huckfeldt et al. 2004; Huckfeldt and Sprague 1995; Mutz 2006): Democrats are more likely to be associated with other Democrats and Republicans with other Republicans. Assuming that progressive 'innovators' are more likely to be Democrats, the spread of novel views should be expected to take place more quickly among Democrats than Republicans. Second, even when embedded in politically heterogeneous discussion networks, individuals selectively disclose their opinions on specific issues to people they anticipate will agree with them (Gerber et al. 2012; Cowan and Baldassarri 2018). Thus, for instance, a Democrat who regularly discusses politics with both Republicans and Democrats will be more likely to disclose his/her support for same-sex marriage or the legalization of

marijuana to a fellow like-minded Democrat rather than to a Republican. Both political homophily and selective disclosure will then have the effect of boosting the spread of a novel, progressive political view among Democrats. As networks are rarely perfectly homogeneous, the interpersonal influence process will spread over to Republicans too, although at a lower pace.

In both instances of social influence we should observe lagged, S-shaped curves for partisan subgroups (Figure 1.C, 2nd row). As opposed to issue partisanship, the distinctive feature of partisan secular changes is that both Republicans and Democrats are moving in the same direction, simply at a different pace: Democrats will adopt novel views earlier and at a faster pace in the early period. Later, it would be Republicans' turn to change quickly and catch up. This means that the distance between Democrats and Republicans will first increase, but eventually decrease, following an inverse U-shaped curve (Figure 1.C, 3rd row).

Analytically, there are a few aspects of this process we should keep in mind for our subsequent analyses. First, S-shaped curves are often visible when analyzing ample temporal windows, but the same trend if read on smaller time frames could be interpreted as linear, or be confused with other processes.[4] For instance, if data allow us to identify only the start of an S-shaped adoption curve, this could be easily mistaken for an instance of asymmetric issue partisanship. And a converging trend could indicate the end of a S-shaped curve, or be interpreted as a sign of declining partisanship divisions. Second, from the subgroup curves it is clear that the gap between groups first widens and then narrows. The gap is maximized when the adoption curves are steeper, meaning that opinion on an issue is changing rapidly, and the difference between subgroups is the most pronounced. This gap, however, will reduce, and eventually close as soon as the group of late adopters catches up. Third, the gap might not necessary close completely, because not all individuals may be susceptible to adoption of novel views. Thus, while Figure 1.C depicts the idealtypical partisan secular trend, we might expect actual secularization to reach intermediate equilibria, in which a gap between subgroups remains. In sum, the general distinguishing feature of a secular trend is the collective movement toward more progressive views. The actual form this trend takes, and its final outcome, may vary as a function of the specific underlying dynamics and susceptibility of the population.

Data and Analytical Strategy

We include all issue items that appeared at least 3 times in the American National Election Study (ANES) from 1972 to 2016 in our analysis. Since there were relatively few moral issues in the ANES and our most innovative hypothesis concern this issue domain, we also include all moral issues that are present in the General Social Survey (GSS)'s replicating core for the same time period. Namely, there are only ten ques-

[4] See Stimson (2004: 34-37) for a discussion of the reasons why S-shaped curves are rarely visible in survey data.

tions on moral issues in the ANES and they are limited to a few generic questions about traditional values and new lifestyles, three questions on gay rights, one question on abortion, and one on gender roles. In addition to questions on these issues, the GSS also includes questions on sexuality, such as premarital and extramarital sex, birth control, as well as questions on the legalization of marijuana, capital punishment, divorce, euthanasia etc., and most of them were asked systematically over three decades. Thus, the inclusion of moral issues from the GSS does not only help proving the robustness of our results with a different dataset, but extends it to a set of moral issues that were not covered in the ANES.

This resulted in a set of 78 issues, 51 from the ANES and 27 from the GSS. Attitude questions are classified in four issue domains: in addition to the moral domain, we have economic, civil rights, and security/foreign policy domains. The economic domain includes issues on federal spending, health insurance, job provision and the size of government. Examples of civil rights issues are questions on affirmative action, discrimination against African Americans and other minorities, and equal opportunities. Lastly, defense spending and urban unrest are instances of security and foreign policy issues. Although we report analyses for all four issue domains, there are only a handful of foreign policy issues, and they were asked only for a few years. For this reason we do not pay too much attention to trends in this domain. We recoded all questions such that higher values correspond to "conservative" positions.

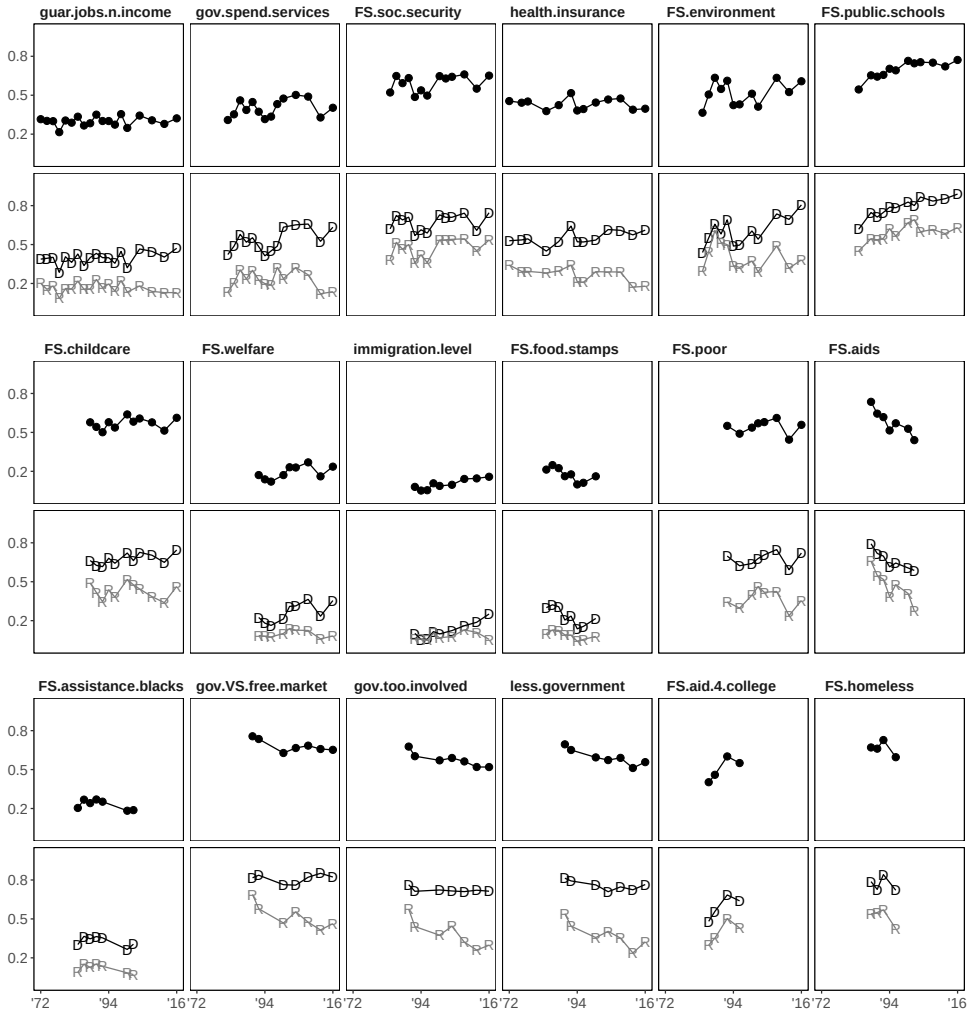
The main outcome of interest is the proportion of liberal responses on each of the issues, where a liberal response is defined as a response below the midpoint of each issue scale.[5] We calculate both the overall proportion of liberal responses as well as the proportion specific to each partisan group—Democrats, Independents, and Republicans—where "leaners" are classified according to their partisanship. All estimated percentages are weighted by sampling weights provided in the ANES and GSS.

Descriptive Results

Visual representation is generally quite effective in capturing major opinion trends. Figures 3 to 6 report, for each issue domain, time trends for our measure of interest. The first row shows population trends, namely the percentage of respondents who gave a liberal response on the issue. The second row shows the same trend for Democrats and Republicans separately. As the number of moral issues was quite large, Figure 5 reports only a subset of 24 issues. Note, however, that when modeling opinion trends, we include all available moral issues. The corresponding plot with all 37 issues is available

[5]To compare responses on different survey questions, it is necessary to standardize the response scales. We use the midpoint of each scale for this purpose as most questions that have either a binary format such as "favor" versus "oppose," a natural midpoint such as "neither agree or disagree," or are asked with a even number of response categories where the first half indicates agreement and the second half disagreement. For items that did not fall into these categories, we tried out different cut points. While the cut-point changed the overall level of liberal responses, the time trend remained essentially the same (results available upon request).

Figure 3: Trends in Public Opinion on Economic Issues, 1972-2016



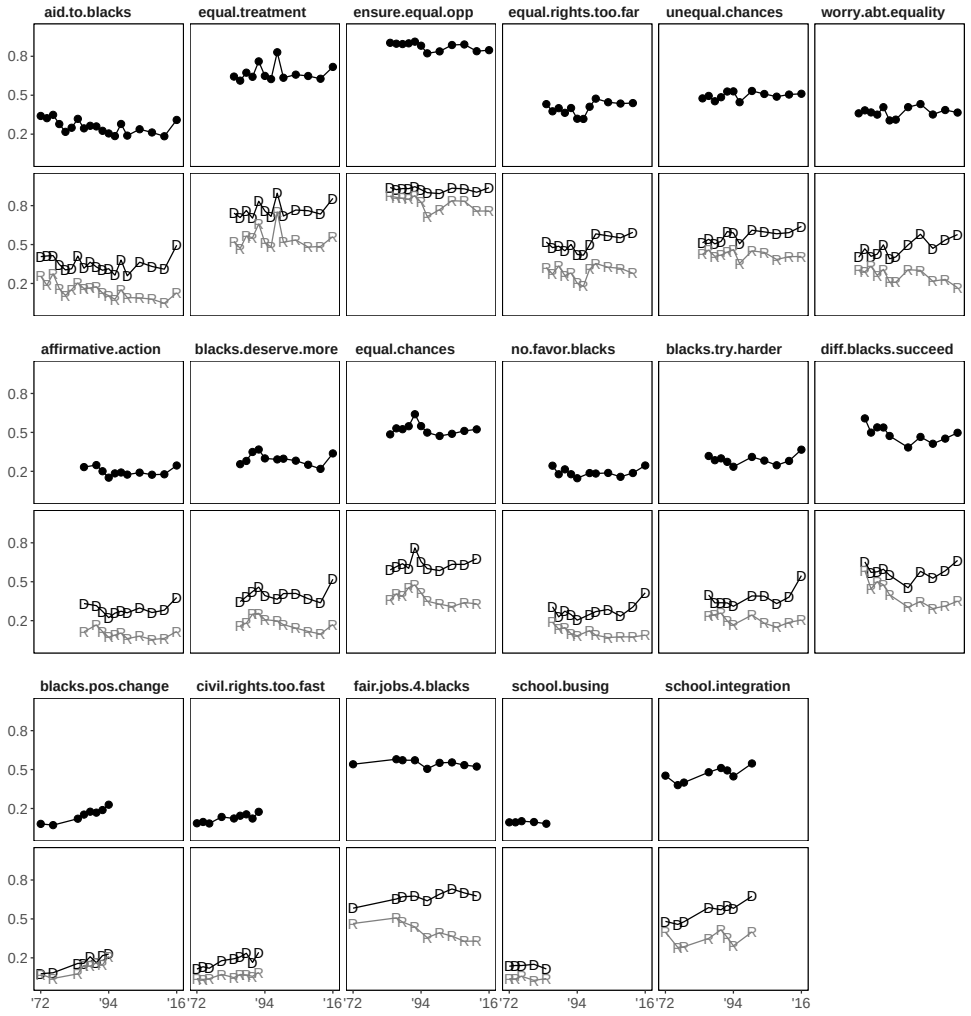
in the online supplement.

A staple result of public opinion research is that "the collective policy preferences of the American public are ... generally stable, seldom changing by large amounts and rarely fluctuating back and forth" (Page and Shapiro 1992: p. xi). Indeed, looking at the population as a whole (first row), stability (or minor fluctuation) is the norm in the economic (Figure 3), civil rights (Figure 4), and foreign policy (Figure 6) domains. Even with respect to civil rights, where Page and Shapiro found considerable changes, the overall position of the public has varied little if at all in the period considered here.[6]

Moral issues, however, follow a different

[6]Of course, there are single exceptions, which are, however, idiosyncratic and not indicative of a general trend. In addition, it should be noted that all federal spending issues were measured in a "relative" manner. That is, respondents were asked whether they want "more" or "less" federal spending on each item, rather than the absolute amount of spending they prefer. Therefore, a constant trend on these issues might indicate that individuals have, in effect, become more liberal if federal spending on these items has increased over time. We deem this possibility unlikely, not only because respondents generally are not knowledgeable about the level of federal spending but because previous research has shown that aggregate trends in the economic domain are either stable or show cyclic behavior (e.g., Page and Shapiro 1992; Stimson 2004). However, we also analyzed only those economic issues that were asked in a "absolute" manner separately. Results of the analysis, shown in Figure S6 of the online appendix, confirm that Democrats and Republicans are, on average, *not* becoming more liberal on these issue.

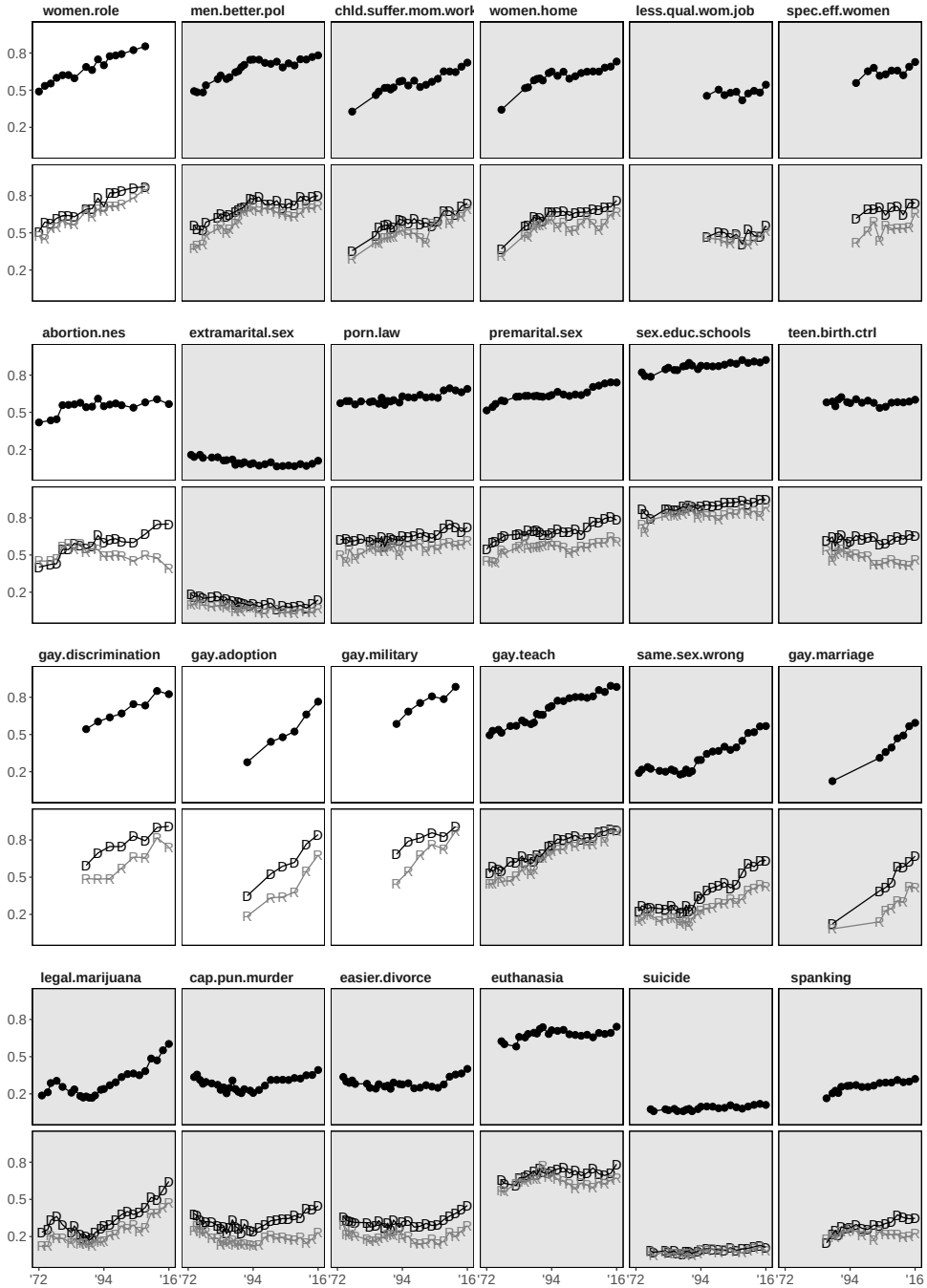
Figure 4: Trends in Public Opinion on Civil Rights Issues, 1972-2016



pattern. Over the last four decades, Americans have become more liberal on most moral issues.[7] For instance, support for gender equality, namely whether women's role in society should be equal to men's, went from 49% in 1972 to 85% in 2008. Having sex before marriage was considered acceptable by 51% of the population in 1986 and 75% in 2016. It is notable that among all of the 37 moral issues under study, only for one issue, namely whether extramarital sex is wrong (extramarital.sex), was the proportion of liberal responses lower in 1972 compared to 2016. Most outstanding however is the fast changing view on gay rights issues, where the shift toward more liberal positions has been dramatic, and is by far the most pronounced opinion change we observe in the data. In only two decades, more than a third of the population has changed its position on gay rights: the approval of the right to adopt children by gay and lesbian couples rose by 48.8 percentage points between 1992 and 2016, and same-sex marriage support grew from 12.4% in 1988 to 59.4% in 2016, a 47 percentage point difference. From

[7]When the proportion of liberal responses on moral issues is regressed on time, 93% of statistically distinguishable time trends (at the $\alpha = .10$ level) were positive. The corresponding numbers for the economic and civil rights domain are 38% and 50%, respectively.

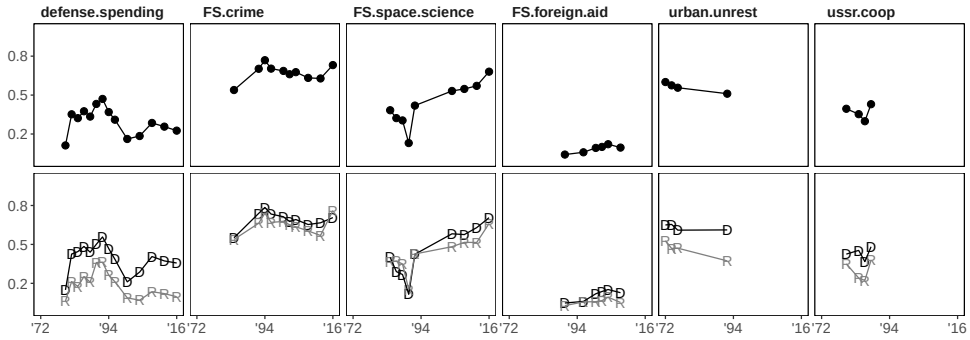
Figure 5: Trends in Public Opinion on Moral Issues, 1972-2016



Notes: Questions from the General Social Survey are shaded in gray.

1992 to 2012, support for the right to serve in the military increased by 30.0 percentage points and support for laws to protect gay and lesbian people against job discrimination by 28.2 percentage points. A change of similar magnitude occurred in the same period concerning marijuana legalization: while less than one-fifth of the population supported it in 1973, the number rose by 41.6 percentage points in the subsequent three decades, with the greatest change occurring between 1992 and 2016. To get a sense of the rapidity of this opinion change, we note that the only comparable change (36.5 percentage points)

Figure 6: Trends in Public Opinion on Foreign Policy & Security Issues, 1972-2016



has occurred with respect to the aforementioned women's role in society and took almost twice as long.[8]

Moving from aggregate patterns to trends in partisan subgroups (plots in the second row), we unveil additional differences between economic and civil rights domains, on the one hand, and moral issues on the other. Even when change is not visible in the overall population, we observe relevant dynamics related to political partisanship in the case of economic and civil rights issues. As widely documented by previous research (DiMaggio et al. 1996; Layman and Carsey 2002; Abramowitz and Saunders 2008; Baldassarri and Gelman 2008), the distance between Democrats and Republicans has increased on several economic and civil rights issues (2^{nd} row). Democrats and Republicans are now better sorted. This sorting process is not symmetric on all issues. For instance, confirming previous research (Brooks and Manza 2013; Ura and Ellis 2012), on issues related to governmental intervention in the economy and market regulation, Republicans have become increasingly conservative, while Democrats have remained relatively stable. Finally, while the overall trend is conducive to greater division, partisans respond to short term forces in a parallel fashion by sharing the ups and downs on most issues.

In contrast, trends in moral issues cannot be described in terms of increased issue partisanship. First of all, we have many instances of convergence, rather than divergence, on moral attitudes. Especially in the last decade, for several issues, including attitudes on gay rights and gender equality, the gap between Democrats and Republicans is closing, not growing. Second, even when Democrats and Republicans have become more different, as in the case of opinion regarding divorce or capital punishment for persons convicted of murder, the divergence is not symmetric: Democrats are becoming more liberal while Republicans remain stable, or becoming more liberal at a slower pace. This could easily be the sign of the beginning of a secular trend, with Democrats moving first.

The most outstanding exception in the

[8] Although some have raised the possibility that a social desirability bias in responses may be partly responsible for the growing support of gay rights issues in surveys (Powell 2013), recent experimental research shows that such bias is minimal or nonexistent (Lax et al. 2015).

moral domain is abortion, which follows a trend of issue partisanship in the later years. The overall approval for its legalization grew steadily in both partisan groups in the 1970s (Luker 1985: Ch 9) and passed the 50% threshold, until, in the late 1980s, a sudden change occurred. Republicans turned more conservative, while Democrats continued to become more liberal. We are, therefore, observing a case of 'arrested development', in which a secular trend was occurring until the issue became politicized (Hout 1999). However, as is evident from Figure 5, abortion is the exception rather than the normality when it comes to trends in the moral domain.

Overall, the visual inspection of opinion trends provides suggestive evidence in favor of the hypothesis that opinion change on moral issues follows a partisan secularization pattern. Exemplary of the trend is the issue of employment discrimination against gay and lesbian people. In the late 1980s, only half of the U.S. population favored laws against job discrimination, and this figure was the same among Democrats and Republicans. Starting in the 1990s, Democrats became increasingly liberal while Republicans stayed put for a few years, and this is when a substantial gap between partisan camps emerged. Thereafter, starting in the late 1990s, Republicans began to catch up, and essentially closed the gap in 2012. By then, four-fifth of the population was in favor of laws to protect gay and lesbian people from job discrimination. The other gay rights issues point towards a similar dynamic. However, since issues in the moral domain do not evolve at the same time and our time frame is limited, we often do not get to see the entire S-shaped curve, but only the beginning or the end. For example, in the case of the gay rights issues pertaining to military service and adoption, we see only the second part of the trend, when the gap is closing. In the case of marijuana legalization or same-sex marriage, instead, we observe only the first part of the curve, with a steep increase in the overall consensus, but greater adoption rates among Democrats. In these phases of the process, a gap between Democrats and Republicans exists, and may even increase over time.

In light of these descriptive trends, our working hypotheses are that public opinion changes in the economic and civil rights domains follow the pattern of issue partisanship, while changes on moral issues are better explained by a secular trend in which both Democrats and Republicans move toward more progressive positions, but at a different pace. To formally test these hypotheses, in the next section we employ a series of multilevel models. We expect to see that partisans are moving in opposite directions in the economic and civil rights domain, while they are moving towards the same pole in the moral domain. If this is found to be true, the results would demonstrate that opinion change in the moral domain is consistent with a model of opinion secularization and qualitatively different from the sorting dynamic that characterizes economic and civil rights domains.

Modeling Opinion Trends

As the data have a hierarchical structure, with time nested within issues, we use mul-

tilevel models to summarize the opinion trends (for a similar approach, see Baldassarri and Gelman 2008). Multilevel models have the additional advantage that each issue is weighted inversely to its variance in the estimating procedure (Gelman and Hill 2006). In this way, issues that were only measured a few times can still contribute to the overall estimates, although to a lesser degree than issues that were measured more frequently.

While it is possible to model all four issue domains simultaneously using three-way interactions between time, partisanship, and issue domain, we chose to fit separate models to each domain. As we are expecting to find different time trends across issue domains, fitting separate models has the effect of shrinking the issue-specific time trend towards the domain-specific mean, rather than the grand mean across all issues. In addition, since our outcome is a proportion, modeling the outcome as a normally distributed random variable can lead to predictions that are larger than one or smaller than zero. To avoid these scenarios, we employed multilevel beta regression models with logit link function to summarize the time trends (Ferrari and Cribari-Neto 2004). For each issue domain, we model the outcome as a function of partisanship, time, and their interaction. Finally, we added normally distributed random effects for all predictors (including the intercept, higher order functions of time, and their interaction with partisanship), so that the time trend can vary randomly across issues. All of the models are estimated using a Bayesian approach, where we assigned weakly informative priors to all parameters. Details on the model specifications can be found in the appendix.

Although our visual inspection of opinion trends has revealed a certain complexity, we first use linear models to capture time trends. In these models, the logit of the proportion of liberal respondents on each issue is modeled as a linear function of time, a dummy variables for the partisan groups (with Republicans as the baseline), and their interaction. To make the interpretation easier, we have scaled the coefficients such that the intercept of the model corresponds to the average liberalism, on the logit scale, of Republicans in the starting year 1972. Similarly, the coefficients for Independents and Democrats reflect the difference in liberalism to Republicans in that year. The simple structure of the linear model allows us to directly relate our working hypotheses to the estimated parameters. Namely, the main variable of interest in the analysis is the interaction term between Democrats and time. Given that Democrats were already more liberal than Republicans in 1972, a positive interaction will indicate that the partisan groups have been growing further apart, on average, over the period of study. In addition, a negative coefficient on the time variable indicates that Republicans have become more conservative. This is the trend we expect to see on economic and civil rights issues. For the moral domain on the other hand, where we expect to find a secular trend, the time variable should be positive, indicating that Republicans, on average, are becoming increasingly liberal. The different speed at which partisans become more liberal will be reflected in the interaction term with the partisan dummies. A positive in-

teraction term of time with Democrats, for example, indicates that Democrats are leading the pack, while both Republicans and Democrats are becoming more liberal.

This is, indeed, what we find, as reported in Figure 7. On economic issues and civil rights issues, partisan groups were quite divided already in 1972: the model predicts that the difference in the proportion of liberal responses between Democrats and Republicans was about fourteen and ten percent, respectively. Most importantly, the positive interaction between the Democrat indicator and the time variable shows that the gap between Democrats and Republicans has, on average, grown since then. The estimated time trends, plotted in the first row of Figure 7, suggest further that Democrats and Republicans tend to move towards opposite poles, with Republicans becoming more conservative and Democrats more liberal over time.[9] Thus, the trends on economic and civil rights issues are consistent with a model of growing issue partisanship.

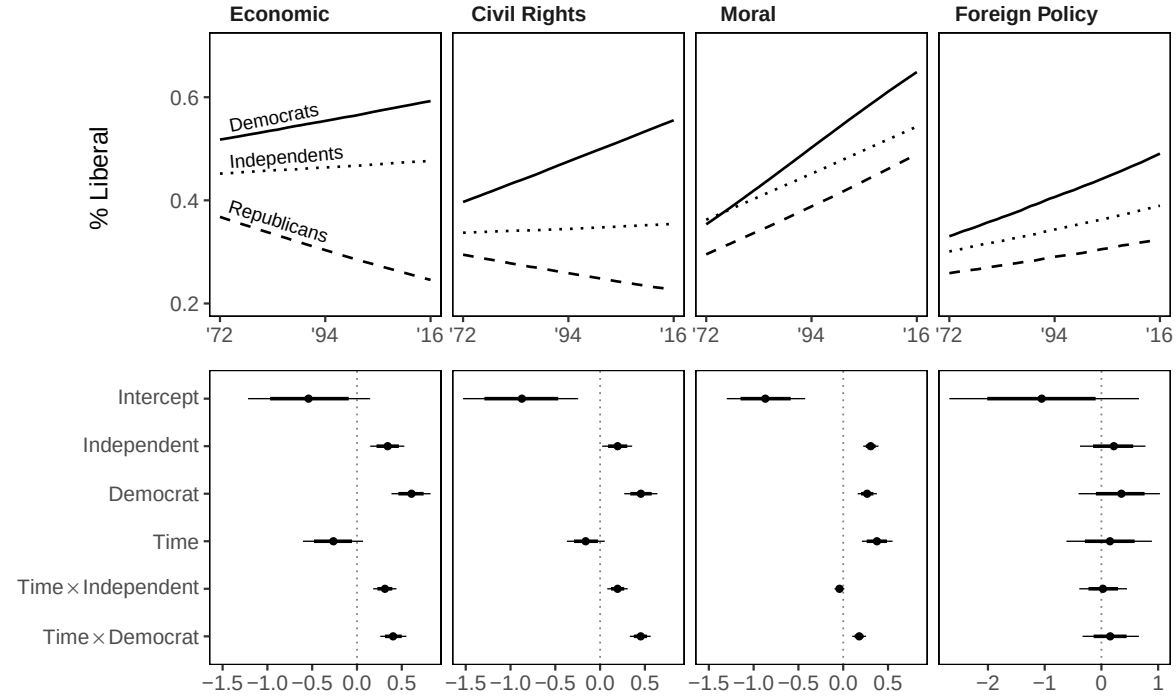
The trend looks different for moral issues. Most importantly, the estimated coefficient for the time variable is positive, indicating that Republicans are becoming more liberal, rather than conservative, on moral issues. The positive interaction of time and the dummy for Democrats, in addition, demonstrates that Democrats are becoming more liberal at a faster pace than Republicans. This is also reflected in the predicted trends for moral issues, where it is clear that *all* partisan groups have become more liberal over time, although at a different rate.[10] This pattern is consistent with a partisan secular trend, where Democrats are leading the pack, followed by Independents, and Republicans. Lastly, on foreign policy / security issues, the wide credible intervals of the coefficients show that the data are too noisy to reach any firm conclusions for this set of issues.

While the linear model shows the general direction towards which partisans are moving, it has inherent limitations in representing more complicated patterns of opinion change. In particular, the rapid surge in liberalism on moral issues after a period of stability, as observed in the descriptive trends on legalizing marijuana, or a pattern in which partisan first diverge only to converge again latter, as observed on some gay rights issues, cannot be captured by these models. To model the non-linear trends, we fitted models with quadratic and cubic time trends to each of the domains. As before, interactions between dummy variables for the partisan groups and the linear as well as higher-order time variables are included in the models. To compare the predictive fit of different models, while preventing overfitting the data, we relied on PSIS-LOOCV (Leave-one-out Cross Validation using Pareto-Smoothed Importance Sampling) and the WAIC (Watanabe-Akaike Information Criterion) for model compari-

[9]The time trend for each of the partisan groups is noisier than the difference between them. The estimated posterior probability that the time trend for Republicans is negative is estimated to be .94 and .93, for the economic and civil rights domain, respectively. Corresponding numbers for the posterior probability that the trend for Democrats is positive is .80 and .99.

[10]The estimated posterior probability that the trend coefficients are positive for moral issues were 1.00, 1.00, and .99 for Democrats, Republicans, and Independents, respectively.

Figure 7: Estimated Coefficients and Trends from Multilevel Beta Regression Model with Linear Time Trends, 1972-2016

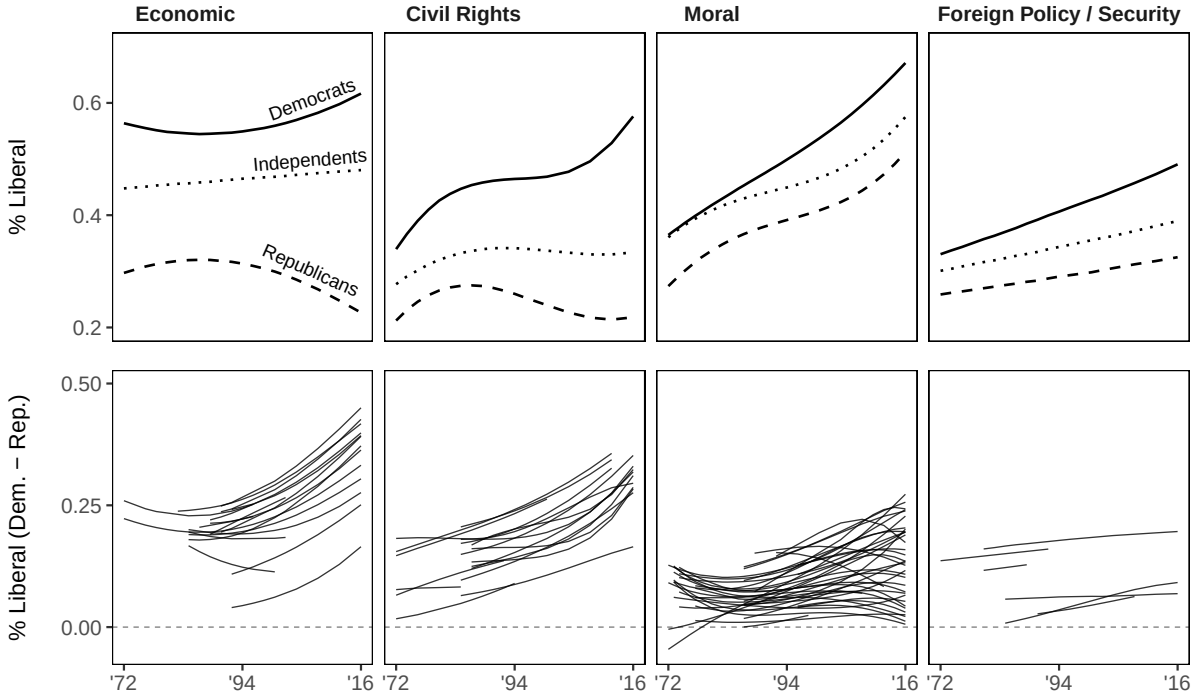


Notes: 1) Plots in the first row show the posterior median of the predicted average trend for the partisan groups. 2) Plots in the second row show the estimated coefficients of the model, where the dot represents the posterior median. Thick and thin lines, respectively, are the 90% and 95% credible intervals of the parameters. 3) In all models, Time is scaled such that a value of zero corresponds to the year 1972 and a unit increase corresponds to 20 years.

son (Vehtari et al. 2017). Results of the comparison, shown in Table 1 of the appendix, suggest that linear models fall indeed short in capturing the pattern in the data. Instead, results of the analysis suggest that the economic domain is best modeled with a quadratic time trend, whereas for the civil rights and moral domain a cubic time trend is more appropriate. Lastly, for the foreign policy / security domain, the LOOIC and WAIC disagreed, with the LOOIC preferring a model with linear time trend and the WAIC one with quadratic time trend. Yet, both of the statistics suggested that adding a quadratic term does not improve the fit of the linear model by much. Hence, we use the linear model for the foreign policy / security domain in what follows. Posterior predictive checks, included in the online supplement, suggests that the models do well in capturing the trends in the data.

Since the coefficients of models with quadratic and cubic terms are difficult to interpret directly, here we simply plot the predicted trends and present the estimated coefficients, together with accompanying uncertainty estimates, in the appendix. Results are presented in Figure 8, where the first row of the figure shows the aggregate mean trends and the second row the predicted difference in liberalism between Democrats and Republicans for each issue. The overall direction towards which partisan groups are moving are in line with the results of the linear models. However, Figure 8 shows a much more nuanced picture. For example, it becomes

Figure 8: Estimated Average Trends and Issue-wise Difference in Liberalism, Multilevel Beta Regression Results, 1972-2016



Notes : 1) Lines in first row of the figure are posterior medians of the estimated average trend across issues. 2) Lines in the second row show posterior medians of the estimated difference between Democrats and Republicans on each issue.

evident that much of the divergence of the partisan groups on economic and civil rights issues occurred in the later half of the analyzed period, namely from the early 1990s onwards. On moral issues, Democrats and Republicans follow an almost parallel trend, with both groups becoming increasingly liberal over time.[11] The trend for Democrats is close to linear, while the Republicans' trend shows some fluctuations with an overall increasing trend. In sum, even with nonlinear time trends, we observe that issues in the moral domain show a distinct pattern of growing liberalism, where Democrats are moving ahead of Republicans, while the the partisan groups are moving in opposite directions on economic and civil rights issues.

Moving to the second row of Figure 8, we unveil additional differences across issue domains. The gap between Democrats and Republicans is growing on virtually all economic and civil rights issues. Furthermore, the rate at which the partisan groups are pulling apart is estimated to be accelerating for many issues as well, especially in the economic domain. In other words, the speed at which Republicans and Democrats are sorting themselves into the "right" ideological camps has increased over time. The moral domain shows again a contrasting picture. Most notably, the trends are much more heterogeneous: while the difference in liber-

[11] Notice that the aggregate trend will, in general, not show an S-shaped pattern even if all issues would follow that pattern. This is because the trend on each issue will unfold on a different time scales with different starting points. As Figure 8 is plotting the average liberalism across all issues, it will average the percentage of liberal responses for issues that are at the end of the diffusion process (and thus high) with those which are just starting to unfold (and thus low).

alism between Democrats and Republicans is growing on some issues, for other issues the gap remains quite stable or tends to *decrease* over time. We find even issues for which the gap first increases and, thereafter, decreases. Notice that these changes in the partisan gap are occurring while, at the same time, Democrats and Republicans are *both* becoming more liberal on most of the issues. Hence, the changing distances between Democrats and Republicans is a reflection of the differential rate at which Democrats and Republicans become liberal, rather than signs of a diverging trend.

Taken together, it seems safe to conclude that issues in the economic and civil rights domain follow a pattern of growing issue partisanship, while the opinion change on moral issues is better characterized by a partisan secular trend. Furthermore, the rate at which both Democrats and Republicans are becoming more liberal on moral issues is too fast to be attributed to mere demographic replacement. Given the stability of party identification (Green and Palmquist 1994; Green et al. 2004), it is also implausible that the main driving mechanism behind the secular trend lies in the changing composition of the partisan groups. Indeed, while separating out the influence of changing demographics from that stemming from influence processes and attitude changes is impossible in the absence of exogenous variation, using statistical controls to "hold constant" the demographic profile of the population did not change the substantive conclusion of the analysis. Even after adjusting the trends for demographic changes *both* Democrats and Republicans showed a consistent liberal trend on the vast majority of moral issues. While these results, shown in the online supplement, are not sufficient to make any rigorous causal claim, they add confidence to our interpretation that the recent change in moral issues is, at least in part, due to mechanisms of opinion change not attributable to generational replacement or compositional change of the partisan groups.

Conclusions

The growing partisan divide in American public opinion, and on moral issues in particular, occurred at an unusually fast pace, and scholars took notice. Indeed, at the turn of the century, it seemed as if moral issues were about to become as divisive as the traditional New Deal issues (Baldassarri and Gelman 2008; Layman and Carsey 2002).[12]

Looking at public opinion changes with the advantage of an additional decade of data, we uncovered a different story. The growing partisan divide is largely confined to economic and civil rights issues, while changes in the moral domain follow the typical pattern of a secular trend, in which the public as a whole moves towards more liberal positions. Thus, although it might be an overstatement that the culture war never came, our interpretation is that the increased

[12]For example, Hetherington (2009) noted that "If anything, the issue environment has become increasingly conducive to a culture war, with gay rights, in particular, playing a central role in 2004 ... It is worth noting that the gulf between non-black Democrats and Republicans on gay rights is roughly the same today as was the difference between southerners and non-southerners on civil rights in the mid-1960s. In fact, opinions today on gay rights are, in some cases, even more divergent" (pp. 430-434).

divide between Democrats and Republicans on moral issues is likely an epiphenomenon of a secularization process: the by-product of the different pace at which Democrats and Republicans have adopted liberal views on these topics. Namely, in the presence of a partisan secular trend the gap between party supporters increases during the take-off phase, when Democrats are adopting new views in larger numbers. However, on a variety of issues Republicans tend to catch up eventually, and indeed we observe that in several instances the gap decreases (Figure 8). Finally, when opinion data cover a long-enough period of time, or public opinion changes fast enough, we observe the full trend, with the gap increasing and then decreasing, as one would expect in case of an S-shaped diffusion curve.

About a decade ago, Fiorina and Levendusky (2006) described the uniqueness of opinions on school prayer, women's rights, and same-sex relations: on these issues, the authors report, both Democrats and Republicans are becoming more liberal and "an increasing number of ordinary Americans appear to be walking away from the conflicts that characterize the party elites" (p. 69; cf. Stimson 2004: Ch 2). In this paper we showed that this trend is not unique, as it characterizes a wider array of moral issues and over a longer time-span. We also theorize about the nature of this process, advancing the hypothesis of a partisan secular trend in which the diffusion of progressive views may be fueled by partisanship. Finally, we show how this partisan secular trend, which is a process of consensus shifts, might be mistakenly *perceived* as a process of polarization due to the differential speed at which the two subpopulations are adopting new ideas (Fiorina and Abrams 2008: p. 567). In the next paragraphs we speculate about the micro-level dynamics which may have brought about this phenomenon.

Opinions on moral issues have evolved in a way that is different from other issues, and the top-down model of public opinion change falls short in accounting for this trend. Had the mass followed elite cues as is often assumed (e.g., Carmines and Stimson 1989; Zaller 1992; Levendusky 2009), moral issues should have shown patterns of issue partisanship similar to those observed in the civil rights and economic domain, since virtually all issue domains have become aligned with partisanship in Congress after the late 1970s (Poole and Rosenthal 2011). Yet, while Republican leaders were turning into fervent supporters of a new brand of moral conservatism, their base has embraced increasingly liberal views on those same issues. The only exception is the issue of abortion, which is shown, however, to be the anormality rather than the norm. In sum, on moral issues and at least on the Republican side, opinion changes did not follow a classic top-down model in which voters are lead by their elites. Instead, a bottom-up process in which the public is moving according to a secular trend seems to be responsible for the observed opinion change.

In addition, while the overall levels of liberalism were often overlooked in polarization studies, we contend that secular changes naturally put an upper bound to the possible level of partisan divisions. For instance, with 80% of the public supporting gender

equality, only 20% of the electorate is able to disagree with the rest of the population. Even if the conservative 20 percent consists solely of Republicans, the possibility for partisan alignment on this issue will be limited.[13] For a full-blown partisan divide, the aggregate level of liberalism has to be therefore near 50%. In Stokes (1963) terms, secular trends in which the public as a whole becomes increasingly progressive over time tend to transform "position issues" into "valence issues" as the process fully unfolds.

Furthermore, opinion change, especially on topics concerning gender roles, sexuality, marijuana legalization, and gay rights, has occurred too quickly to be accounted for by generational replacement or demographic shifts (Loftus 2001; Andersen and Fetner 2008; Fischer and Hout 2006). Instead, the secular trend observed for these issues is consistent with a social diffusion dynamic, which operates *within* generations. In addition, the lag in the adoption curves between Democrats and Republicans (and its persistence even when controlling for the demographic sorting of the electorate) points to the importance of partisan groups in the diffusion process.

Although we cannot provide empirical evidence of the micro-level dynamic of social influence, here we offer some considerations concerning some of the potential underlying mechanisms. In particular, as already anticipated in our general discussion of partisan secular trends, media partisanship, the homophily of political discussion networks, and the mechanism of selective disclosure may contribute to the social diffusion process documented in this paper. Namely, progressive 'innovators', who are likely to be Democrats, will spread their views, first, among like-minded Democrats, both because their political discussion networks are disproportionally composed by fellow Democrats, and because they selectively disclose their opinions on salient issues to others who they anticipate will agree with them. However, since discussion networks are far from being perfectly homogeneous (Huckfeldt et al. 1995), progressive opinions would eventually spread among Republicans as well.

In addition, some specific considerations concerning the structural position of gay and lesbian people in social networks may partially explain why Republicans have so speedily embraced secular views on LGBT issues when their elites chose to do otherwise. As with other minority groups, knowing someone who is gay has been shown to increase the support for gay rights among almost all subgroups defined by socio-demographics, ideology, and partisanship (Lewis 2011). However, compared to racial and socioeconomic cleavages that heavily segregate the interaction patterns of Americans, recent research suggests that interactions with gay and lesbian people are

[13] For example, suppose that the public consist of 100 individuals out of which half are Republicans and the other half Democrats. Further assume that the aggregate percentage of individuals supporting gender equality is 80%, and that all individuals opposing it are Republicans. In such a situation, the majority—30 out of 50—of Republicans would be in *agreement* with Democrats on this issue.

[14] Although these estimates are based on self-reports and thus subject to recall bias, they have a very important feature for our discussion. Namely, they do report on ties to people who are actually known to be gay, thus already taking into account gay people's selective patterns of disclosure of their sexuality.

relatively uniformly distributed across the population (DiPrete et al. 2011).[14] This is especially true for social ties within the family, which tend to be "strong ties" both in the emotional and structural sense (Granovetter 1973). The implication is that, at least in recent years, both Republicans and Democrats have similar probabilities of knowing someone *in their close social circles* who is gay or lesbian. Thus, the social influence process might have operated 'close to home', from within the family outwards. This may explain why Republicans have turned towards more progressive views so easily on these issues. After all, even if party identification operates as a perceptual screen of the political world (Campbell et al. 1960), it seems safe to expect that the coming out of a family member or close friend will be a much more persuasive message than the partisan cues of the political elite.

In sum, empirical evidence supports the claim that public opinion changes on moral issues have followed a secular trend in which both Democrats and Republicans have adopted more progressive opinions, although at a different pace. We speculate about the micro-level processes that bring about such outcomes: the partisan lag in the diffusion curves is likely due to mechanisms of homophily and selective disclosure in political discussion networks. Whereas the extraordinary pace of the change on gay rights issues may be due to the diminished segregation and increased visibility of openly gay or lesbian people within social networks. Taken together, these considerations point to the different nature of public opinion change in the moral domain, and the possible primacy of social diffusion processes over more classic, party-driven models of opinion change.

Why is public opinion in the moral domain evolving differently from other domains? Although we cannot provide a fully satisfactory answer here, we mention a couple of possible reasons. First, not all issues are created equal. While the political debate in Western democracies is usually organized around economic and eventually, geographic or ethnic cleavages (Lipset and Rokkan 1967), most positions on moral issues do not logically follow from core political ideologies. This is certainly true in most Western European countries, where the church-state separation is often written in the Constitution, and the political debate is mainly organized around issues of redistribution, welfare state, and taxation. However, even in the US, the logical link between parties' core ideologies and their stand on moral issues is weak at most (Converse 1964; Baldassarri and Goldberg 2014): for example, it is quite difficult to reconcile Republicans' laissez faire economic agenda and their opposition to any form of gun control with their heavily regulatory stand on reproductive issues. Second, moral issues are often concerned with whether a certain behavior – e.g., women employment in the workforce, smoking marijuana, gay and lesbian couples raising kids – is considered acceptable. As a long tradition in sociology has demonstrated, what is considered 'moral' often coincides with what is considered normal, or 'average behavior' in a society: thus the social norm that most people follow in a given space-time (Durkheim 1906). If this is the case, it is understandable why opinions on this type of

Table 1: LOOIC and WAIC statistics comparing the predictive fit of multilevel beta regression models with different time trends

Issue Domain	Time Trend	LOOIC	WAIC
Economic	Quadratic	-1461.84	-1464.67
	Linear	-1456.10	-1456.69
	Cubic	-1454.68	-1459.57
Civil Rights	Cubic	-1875.87	-1883.88
	Quadratic	-1848.39	-1851.71
	Linear	-1822.79	-1821.66
Moral	Cubic	-7646.38	-7638.93
	Quadratic	-7464.99	-7452.42
	Linear	-7035.38	-7016.73
Foreign Policy / Security	Linear	-276.80	-278.77
	Quadratic	-276.66	-281.43

issues are more subjected to bottom-up dynamics of diffusion and social influence.

Appendix : Model Specifications and Comparisons

Let y_{it} be the proportion of liberal responses at year t on issue i. We assume that $y_{it}|\mu_{it}, \nu \sim \text{Beta}(\mu_{it}, \nu)$, where the Beta distribution is parameterized through the mean, μ_{it}, and the "precision" parameter ν.[15] The mean structure of the model is specified as a function of time, partisanship, and their interactions. For example, in a model with quadratic time trend, the mean is modeled as

$$\begin{aligned}\mu_{it} = \text{logit}^{-1}\Big[& \\ & \gamma_{0,i[t]} + \gamma_{1,i[t]}\text{IND}_t + \gamma_{2,i[t]}\text{DEM}_t \\ & + \gamma_{3,i[t]}\text{TIME}_t + \gamma_{4,i[t]}\text{TIME}_t^2 \\ & + \gamma_{5,i[t]}(\text{TIME}_t \times \text{IND}_t) \\ & + \gamma_{6,i[t]}(\text{TIME}_t \times \text{DEM}_t) \\ & + \gamma_{7,i[t]}(\text{TIME}_t^2 \times \text{IND}_t) \\ & + \gamma_{8,i[t]}(\text{TIME}_t^2 \times \text{DEM}_t)\Big],\end{aligned} \tag{1}$$

where IND_t and DEM_t are dummy variables for the partisan groups (with Republicans as the baseline) and where it is assumed that $\gamma_i \sim \text{Multivariate Normal}(\mu_\gamma, \Sigma_\gamma)$. This specification enables us to model the time trend of all issues and partisan groups with maximum flexibility, allowing each issue to have a partisan-specific time trend. On the other hand, the multilevel structure of the model prevents overfitting by shrinking the estimated time trend of each issue towards the domain-specific mean trend. We assign all parameters weakly informative priors, with $\mu_\gamma \sim \text{Normal}(\mathbf{0}, 5\mathbf{I})$, where $\mathbf{I}$ is a diagonal matrix, and $1/\nu \sim \text{Half-Cauchy}(3)$. The covariance matrix Σ_γ is decomposed into $\Sigma_\gamma = \text{diag}(\sigma)\Omega\text{diag}(\sigma)$ where Ω is the correlation matrix and σ contain the standard deviations of the random effects. We assign priors $\Omega \sim \text{LKJ}(2)$ and, $\forall l, \sigma_l \sim \text{Half-Cauchy}(3)$. All models are fitted using a Hamiltonian Monte Carlo algorithm implemented in `Stan` using the `rstan` pack-

[15] The relationship between the mean-precision parameterization and the usual parameterization of the beta distribution is as follows. If we denote by α and β the two shape parameters of the beta distribution, we have $\alpha = \mu\nu$ and $\beta = (1-\mu)\nu$, where μ is the mean of the distribution and $\nu = \alpha + \beta$ the precision parameter.

Table 2: Estimated Coefficients and Uncertainty Estimates for Final Models, Multilevel Beta Regression Results, 1972-2016

	Economic		Civil Rights		Moral		Foreign Policy/Security	
Variables	Median	95% Cred. Int.	Median	95% Cred. Int.	Median	95% Cred. Int.	Median	95% Cred. Int.
Intercept	-0.783	(-1.319,-0.222)	-1.047	(-1.651,-0.415)	-0.442	(-0.859,-0.037)	-0.892	(-2.263,0.533)
Independent	0.639	(0.531,0.744)	0.393	(0.274,0.520)	0.242	(0.185,0.298)	0.242	(-0.101,0.604)
Democrat	0.977	(0.865,1.095)	0.903	(0.766,1.046)	0.439	(0.365,0.515)	0.509	(0.064,0.992)
Time	-0.085	(-0.261,0.093)	-0.164	(-0.290,-0.029)	0.114	(0.017,0.211)	0.075	(-0.309,0.445)
Independent × Time	0.113	(0.038,0.193)	0.149	(0.051,0.246)	-0.016	(-0.061,0.032)	0.014	(-0.195,0.226)
Democrat × Time	0.131	(0.048,0.213)	0.183	(0.086,0.281)	0.123	(0.077,0.170)	0.077	(-0.166,0.330)
Time^2	-0.056	(-0.114,0.011)	-0.049	(-0.147,0.024)	-0.004	(-0.038,0.030)		
Independent × Time^2	0.054	(0.001,0.108)	0.014	(-0.032,0.059)	0.017	(-0.002,0.036)		
Democrat × Time^2	0.089	(0.034,0.146)	0.043	(0.001,0.088)	0.021	(0.005,0.038)		
Time^3			0.035	(-0.006,0.078)	0.025	(0.009,0.041)		
Independent × Time^3			-0.019	(-0.050,0.013)	-0.004	(-0.017,0.009)		
Democrat × Time^3			0.007	(-0.024,0.037)	-0.014	(-0.028,-0.000)		
ν	65.584	(57.014,75.321)	107.037	(91.268,123.547)	145.719	(136.074,155.915)	25.857	(19.807,32.936)
Σ(Intercept)	1.131	(0.804,1.697)	1.243	(0.900,1.902)	1.228	(0.992,1.581)	1.388	(0.774,3.222)
Σ(Independent)	0.136	(0.022,0.270)	0.198	(0.120,0.323)	0.142	(0.101,0.197)	0.245	(0.018,0.784)
Σ(Democrat)	0.170	(0.065,0.295)	0.229	(0.143,0.360)	0.205	(0.158,0.267)	0.400	(0.133,1.094)
Σ(Time)	0.333	(0.224,0.518)	0.201	(0.116,0.343)	0.267	(0.211,0.350)	0.320	(0.146,0.894)
Σ(Independent × Time)	0.070	(0.013,0.145)	0.117	(0.048,0.226)	0.083	(0.063,0.111)	0.083	(0.004,0.417)
Σ(Democrat × Time)	0.037	(0.002,0.125)	0.056	(0.008,0.113)	0.037	(0.027,0.051)	0.109	(0.005,0.555)
$\Sigma(\text{Time}^2)$	0.049	(0.002,0.144)	0.033	(0.002,0.103)	0.061	(0.029,0.107)		
Σ(Independent × Time^2)	0.020	(0.001,0.074)	0.032	(0.002,0.106)	0.064	(0.008,0.111)		
Σ(Democrat × Time^2)	0.026	(0.001,0.093)	0.026	(0.001,0.084)	0.025	(0.003,0.049)		
$\Sigma(\text{Time}^3)$			0.022	(0.001,0.072)	0.011	(0.000,0.033)		
Σ(Independent × Time^3)			0.010	(0.000,0.035)	0.009	(0.000,0.027)		
Σ(Democrat × Time^3)			0.008	(0.000,0.030)	0.018	(0.002,0.031)		

Notes: 1) ν is the precision parameter of the beta distribution. SD$(\cdot)$ shows the standard deviation of the random effects. Covariances are estimated but not shown for clarity.

age in R. We ran six chains with 3,000 iterations, where the first 2,000 iterations were used to tune the algorithm (warm-up) and the remaining 1,000 iterations were sampled for inference. This results in 6,000 posterior samples per model. All chains showed signs good mixing with the potential scale reduction factor, $\hat{R}$ (Gelman et al. 2014), being below 1.02 for all parameters in the reported models. The estimated effective sample sizes were above 300 for all parameters with a mean between 3,900 and 5,950 across the models. None of the post-warm-up transitions resulted in divergences or exceeded the specified maximum treedepth of the algorithm.

The PSIS-LOOIC and WAIC statistics for the fitted models are shown in Table 1. As other information criteria (except the BIC), the LOOIC and WAIC are approximations to the out-of-sample deviance and, thus, lower values are interpreted as a better predictive fit of a model.[16] A shortcoming of using information criteria to select models is that they show only the *relative* predictive fit of the candidate models. In other words, it can happen that all models fit the data rather poorly, in which case the information criteria would simply pick the least poorly fitting model from them. Hence, to assess the "absolute" fit of the model, we compared the observed trends on each issue in the data to a series of random draws from the posterior predictive distribution. These checks, included in the

[16]We also considered models in which the outcome is modeled through normal distributions. Both LOOIC and WAIC clearly preferred the beta distribution over the normal for the outcome. Results can be found in the replication material.

online supplement, show that the models are performing well in reproducing the pattern in the data.

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Online Supplement

Variable Description

Source	Label	Domain	Org. Name	Variable Label
ANES	health.insurance	Economics	VCF0806	Government Health Insurance Scale
ANES	guar.jobs.n.income	Economics	VCF0809	Guaranteed Jobs and Income Scale
ANES	gov.spend.services	Economics	VCF0839	Government Services/Spending Scale
ANES	immigration.level	Economics	VCF0879a	U.S. Immigrants Should Increase/Decrease
ANES	FS.poor	Economics	VCF0886	Federal Spending- Poor/Poor People
ANES	FS.childcare	Economics	VCF0887	Federal Spending- Child Care
ANES	FS.aids	Economics	VCF0889	Federal Spending- Aids Research/Fight Aids
ANES	FS.public.schools	Economics	VCF0890	Federal Spending- Public Schools
ANES	FS.aid.4.college	Economics	VCF0891	Federal Spending- Fin Aid for College Students
ANES	FS.homeless	Economics	VCF0893	Federal Spending- The Homeless
ANES	FS.welfare	Economics	VCF0894	Federal Spending- Welfare Programs
ANES	FS.food.stamps	Economics	VCF9046	Federal Spending- Food Stamps
ANES	FS.environment	Economics	VCF9047	Federal Spending- Improve/Protect Environment
ANES	FS.soc.security	Economics	VCF9049	Federal Spending- Social Security
ANES	FS.assistance.blacks	Economics	VCF9050	Federal Spending- Assistance to Blacks
ANES	less.government	Economics	VCF9131	Less Government Better OR Government Do More
ANES	gov.VS.free.market	Economics	VCF9132	Govt Handle Economy OR Free Market Can Handle
ANES	gov.too.involved	Economics	VCF9133	Govt Too Involved in Things OR Problems Require
ANES	blacks.pos.change	Civil Rights	VCF0813	How Much Has the Position of Blacks Changed
ANES	civil.rights.too.fast	Civil Rights	VCF0814	Civil Rights Pushes Too Fast or Not Fast Enough
ANES	school.integration	Civil Rights	VCF0816	Government Ensure School Integration
ANES	school.busing	Civil Rights	VCF0817	School Busing Scale (self-placement)
ANES	aid.to.blacks	Civil Rights	VCF0830	Aid to Blacks/Minorities Scale (self-placement)
ANES	affirmative.action	Civil Rights	VCF0867a	Opinion + Strength Affirmative Action in Hiring/Promotion
ANES	ensure.equal.opp	Civil Rights	VCF9013	Society Ensure Equal Opportunity to Succeed
ANES	equal.rights.too.far	Civil Rights	VCF9014	We Have Gone Too Far Pushing Equal Rights
ANES	equal.chances	Civil Rights	VCF9015	Big Problem that Not Everyone Has Equal Chance
ANES	unequal.chances	Civil Rights	VCF9016	Not Big Problem if Some Have More Chance in Life
ANES	worry.abt.equality	Civil Rights	VCF9017	Should Worry less about How Equal People Are
ANES	equal.treatment	Civil Rights	VCF9018	U.S. Fewer Problems if Everyone Treated Equally
ANES	fair.jobs.4.blacks	Civil Rights	VCF9037	Government Ensure Fair Jobs for Blacks
ANES	hard.4.blacks.succeed	Civil Rights	VCF9039	Conditions Make it Difficult for Blacks to Succeed
ANES	no.favor.blacks	Civil Rights	VCF9040	Blacks Should Not Have Special Favors to Succeed
ANES	blacks.try.harder	Civil Rights	VCF9041	Blacks Must Try Harder to Succeed
ANES	blacks.deserve.more	Civil Rights	VCF9042	Blacks Gotten Less than They Deserve Over the Past Few Years
ANES	women.role	Morality	VCF0834	Women Equal Role Scale
ANES	abortion	Morality	VCF0838	By Law, When Should Abortion Be Allowed
ANES	new.lifestyles	Morality	VCF0851	Newer Lifestyles Contribute to Society Breakdown
ANES	moral.behavior	Morality	VCF0852	Should Adjust View of Moral Behavior to Changes
ANES	traditional.values	Morality	VCF0853	Should be More Emphasis on Traditional Values
ANES	tolerance.diff.values	Morality	VCF0854	Tolerance of Different Moral Standards
ANES	gay.discrimination	Morality	VCF0876a	Law Against Homosexual Discrimination
ANES	gay.military	Morality	VCF0877a	Favor/Oppose Gays in Military
ANES	gay.adoption	Morality	VCF0878	Should Gays/Lesbians Be Able to Adopt Children
ANES	school.prayer	Morality	VCF9043	When Should School Prayer Be Allowed
ANES	urban.unrest	Foreign Policy	VCF0811	Urban Unrest Scale
ANES	ussr.coop	Foreign Policy	VCF0841	Cooperation with U.S.S.R Scale
ANES	defense.spending	Foreign Policy	VCF0843	Defense Spending Scale
ANES	FS.crime	Foreign Policy	VCF0888	Federal Spending- Dealing with Crime
ANES	FS.foreign.aid	Foreign Policy	VCF0892	Federal Spending- Foreign Aid
ANES	FS.space.science	Foreign Policy	VCF9048	Federal Spending- Space/Science/Technology
GSS	abortion	Morality	ABANY	Summary measure
GSS	cap.pun.murder	Morality	CAPPUN	favor or oppose death penalty for murder
GSS	gay.teach	Morality	COLHOMO	allow homosexual to teach
GSS	less.qual.wom.job	Morality	DISCAFFM	a man won't get a job or promotion
GSS	less.qual.men.job	Morality	DISCAFFW	a woman won't get a job or promotion
GSS	easier.divorce	Morality	DIVLAW	divorce laws
GSS	work.mom.rel.chld	Morality	FECHLD	mother working doesn't hurt children
GSS	women.home	Morality	FEFAM	better for man to work, woman tend home
GSS	spec.eff.women	Morality	FEHIRE	should hire and promote women
GSS	pref.hire.women	Morality	FEJOBAFF	for or against preferential hiring of women
GSS	men.better.pol	Morality	FEPOL	women not suited for politics
GSS	chld.suffer.mom.work	Morality	FEPRESCH	preschool kids suffer if mother works
GSS	legal.marijuana	Morality	GRASS	should marijuana be made legal

GSS	same.sex.wrong	Morality	HOMOSEX	homosexual sex relations
GSS	euthanasia	Morality	LETDIE1	allow incurable patients to die
GSS	gay.book	Morality	LIBHOMO	allow homosexuals book in library
GSS	gay.marriage	Morality	MARHOMO	homosexuals should have right to marry
GSS	teen.birth.ctrl	Morality	PILLOK	birth control to teenagers 14-16
GSS	porn.law	Morality	PORNLAW	feelings about pornography laws
GSS	bib.prayer.schools	Morality	PRAYER	bible prayer in public schools
GSS	premarital.sex	Morality	PREMARSX	sex before marriage
GSS	sex.educ.schools	Morality	SEXEDUC	sex education in public schools
GSS	spanking	Morality	SPANKING	favor spanking to discipline child
GSS	gay.speak	Morality	SPKHOMO	allow homosexual to speak
GSS	suicide	Morality	SUICIDE1	Summary measure
GSS	teen.sex	Morality	TEENSEX	sex before marriage – teens 14-16
GSS	extramarital.sex	Morality	XMARSEX	sex with person other than spouse

Notes: 1) ANES abortion item is merged with VCF0837 for pre-1980 years. 2) GSS abortion item and suicide item are, respectively, summary measures of ABABY, ABDEFECT, ABHLTH, ABNOMORE, ABPOOR, ABRAPE, ABSINGLE and SUICIDE1, SUICIDE2, SUICIDE, SUICIDE4, constructed by counting the number of questions regarding which the respondent agreed. More detailed information regarding the items can be found in the replication materials.

Posterior Predictive Checks

We use fifty draws from the posterior predictive distribution and plot them against the data to assess how well our model reproduces the actual trends. Figures S1 to S4 show the results. While the model misses some of the abrupt changes in the trends, the predictions of the model show a reasonable fit to the data.

Figure S1: Posterior Predictive Checks: Economic Issues

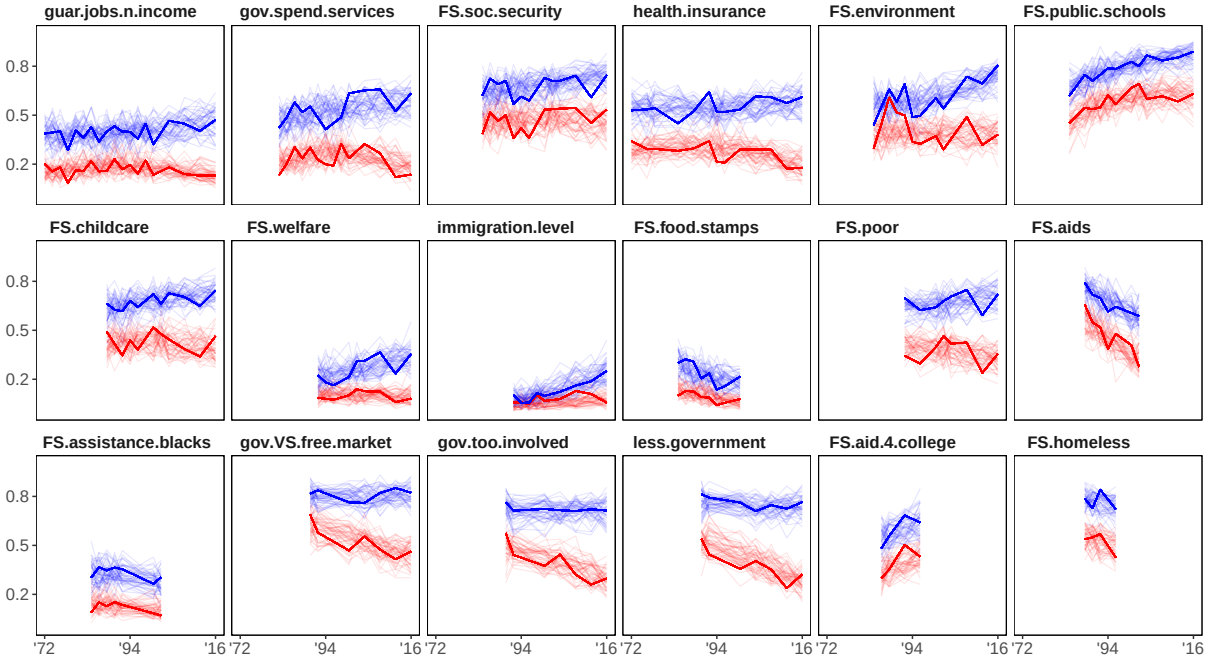


Figure S2: Posterior Predictive Checks: Civil Rights Issues

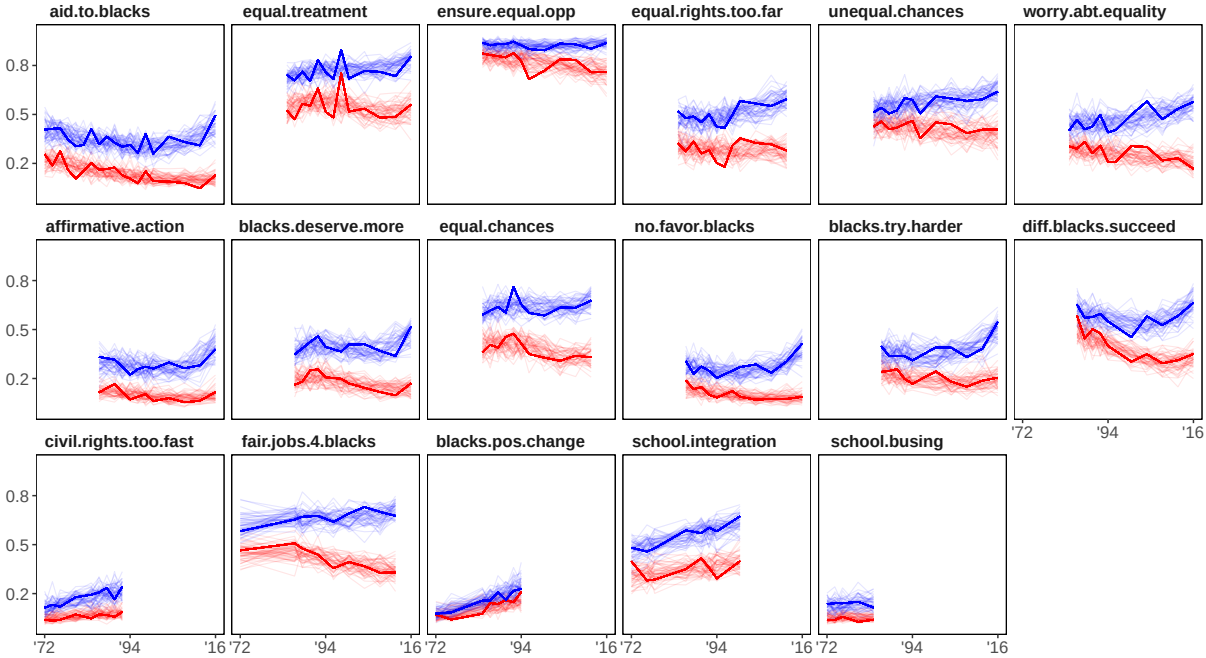


Figure S3: Posterior Predictive Checks: Moral Issues

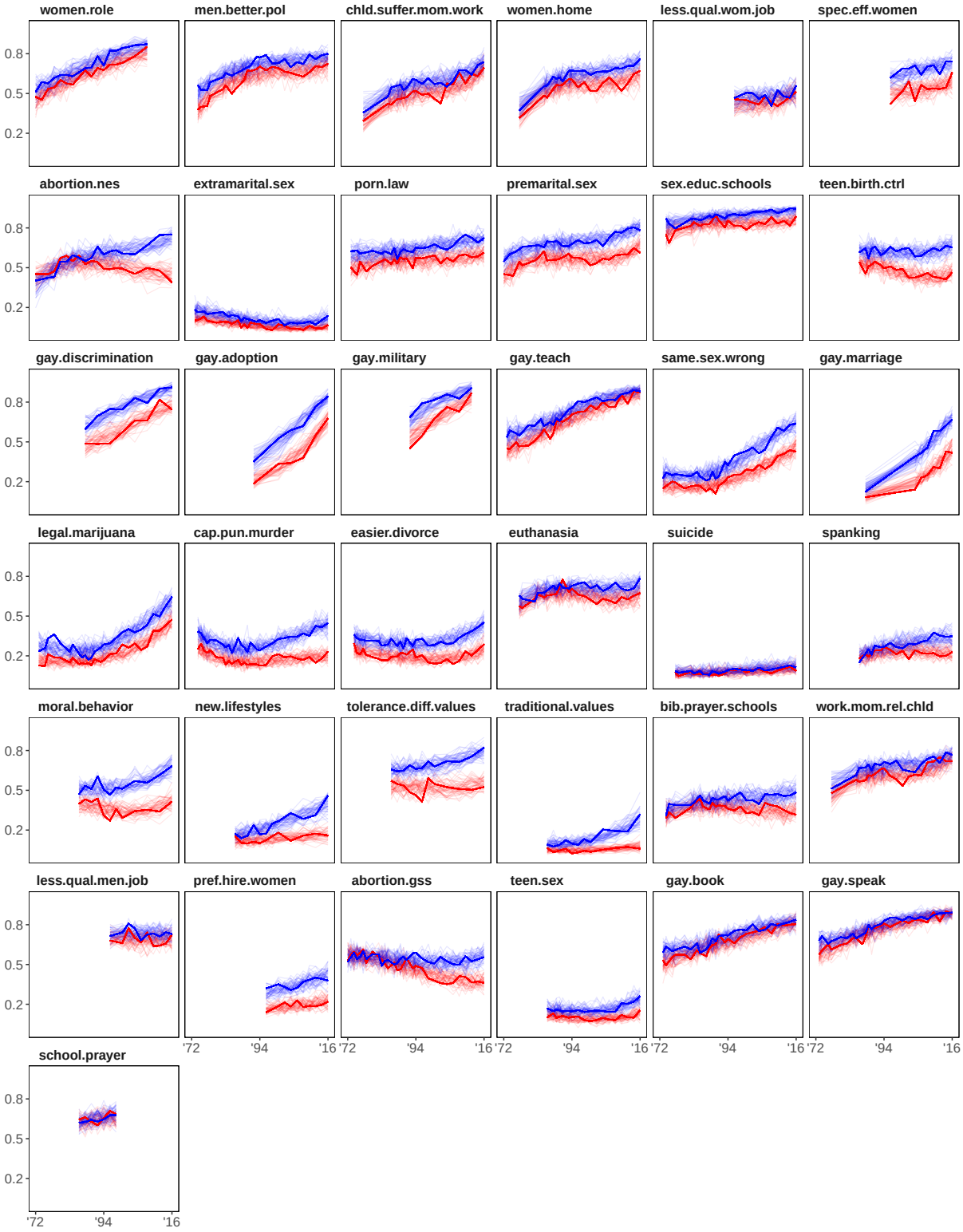
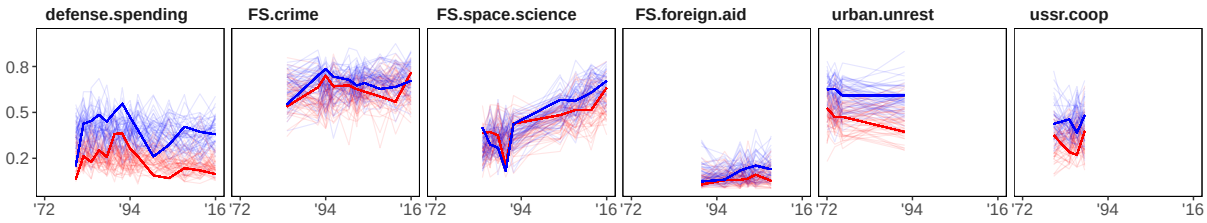


Figure S4: Posterior Predictive Checks: Foreign Policy / Security Issues



Controlling for Compositional Changes

Our analysis shows a consistent upward trend in liberalism on moral issues. A remaining question is whether this trend is driven by real changes in partisans' opinion—namely, whether individuals in different parties are changing their opinion in the same direction—or whether this trend is driven by the demographic profile of the parties. For instance, is it the case that Republican women, who tended to be more liberal on certain moral issues than their male counterpart, have switched over to the Democrats, thus making the Republicans look, in the aggregate, more conservative and Democrats more progressive, or are party members indeed changing their views? Telling apart changes due to opinion shifts from those due to demographic changes is challenging, if not impossible, in the absence of an exogenous source of variation. Yet, we tried to introduce a set of statistical controls in estimating public opinion to at least reduce the potential influence of demographic shifts on the observed trend. As the influence of demographic changes on partisan sorting has been examined in the past (e.g., Levendusky 2009), here we focus on secular trends on moral issues.

Let $y_{ijt} \in \{0,1\}$ be the response on issue j by individual i in year t, where a 1 indicates a liberal response. We model this outcome as a function of partisanship, income, education, gender, race, and residence in the South. We measured all demographic variables through dummy variables where having a bachelor degree or higher, and living in the South, females, and African Americans are coded as 1.[1] Age was coded using four categories, "below 30", "31-44', "45-56", and "over 60," and family income using percentiles with the three categories "lowest 33%," "middle 33%," and "top 30%." We use "below 30" and "lowest 33%" as the baseline category when entering these variables into the regression. The model through which we estimate liberal opinion has the following form:

[1] As the GSS does not provide information regarding the state of residence, we used the census division of the south. For consistency, the NES data were coded in the same way.

$$\log\left(\frac{E[y_{it}^{(j)}]}{1-E[y_{ijt}^{(j)}]}\right) = \alpha^{(j)} + \beta_1^{(j)}\text{Ind}_{ijt} + \beta_2^{(j)}\text{Dem}_{ijt} + \sum_{t=1}^{T}(\gamma_t^{(j)}\text{Ind}_{ijt} + \delta_t^{(j)}\text{Rep}_{ijt})Z_{ijt} + \sum_{t=1}^{T}\lambda_t^{(j)}Z_{ijt} + \sum_{l=1}^{L}\xi_l^{(j)}X_{ijt,l} + \sum_{l=1}^{L}\sum_{t=1}^{T}\zeta_{l,t}^{(j)}(X_{ijt,l}Z_{ijt}),$$

where Ind_{ijt} and Dem_{ijt} are dummies for the partisan groups (with Republicans as the baseline category), $\{X_{ijt,l}\}_{l=1}^{L}$ the set of demographic variables, and the $\{Z_{ijt}\}_{t=1}^{T}$ are year dummies. In other words, we fitted a logistic regression with dummies for partisan groups, demographic variables, and year-indicators, where we allowed the association between outcome and partisanship as well as the demographic variables to vary from year to year. Notice that by interacting the year dummies with age, we are in effect controlling for the association of birth cohorts with opinion.

Using the estimated coefficients from this model, we thereafter predicted the "partial" time trend of the partisan groups by "holding constant" the demographic variables at their mean. For example, the estimated proportion of liberal response for Republican in year $t = 4$ on issue $j = 5$, with the demographic profile being fixed at the grand mean across all years, is

$$\text{logit}^{-1}(\alpha^{(5)} + \lambda_4^{(5)} + C)$$

and that for Democrats

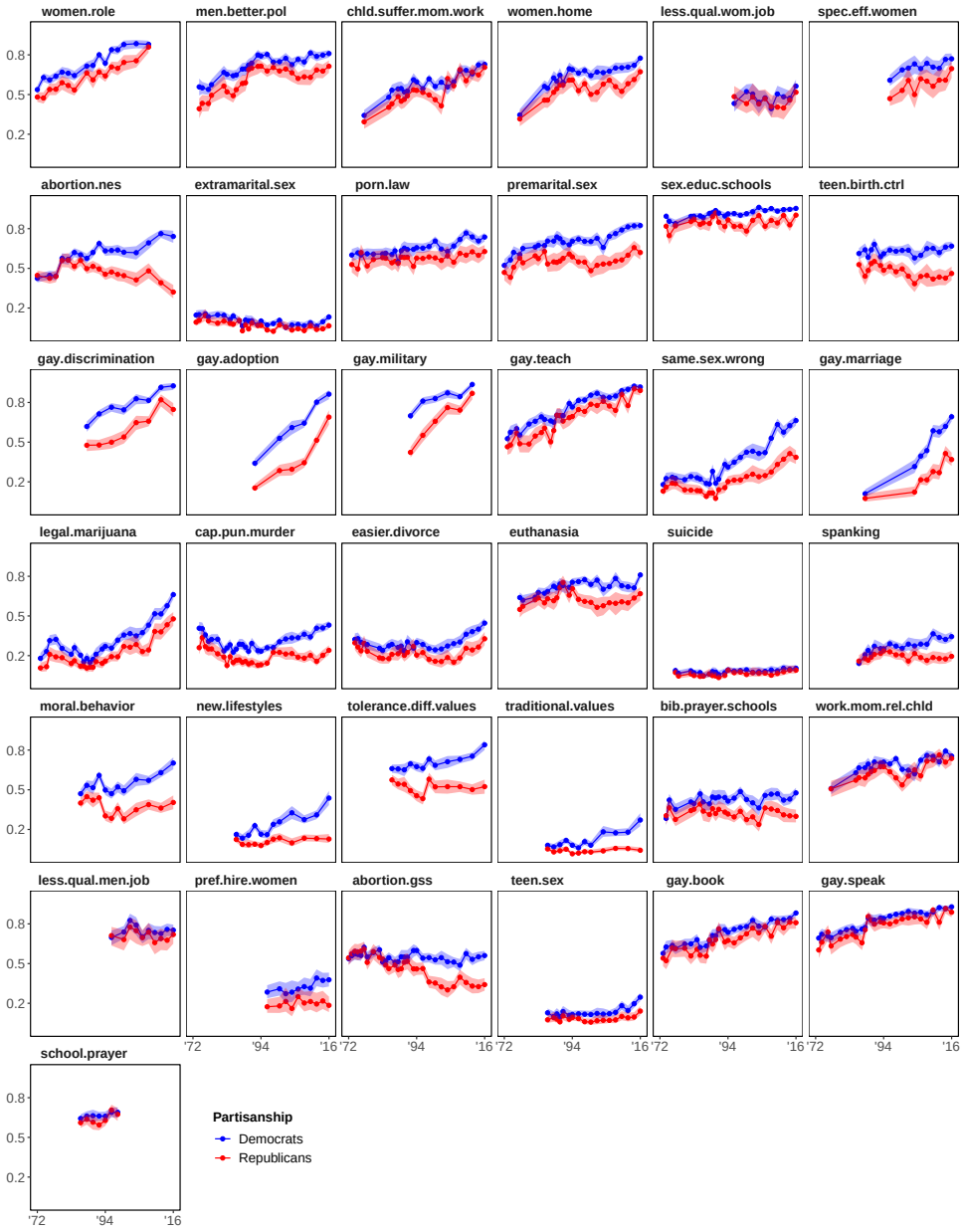
$$\text{logit}^{-1}(\alpha^{(5)} + \beta_2^{(5)} + \delta_4^{(5)} + \lambda_4^{(5)} + C),$$

where $C = \sum_{l=1}^{L}\xi_l^{(5)}\tilde{X}_l + \sum_{l=1}^{L}\zeta_{l,4}^{(5)}\tilde{X}_l$ is the contribution of the control variables in year 4 and $\tilde{X}_l$ is grand mean of covariate l.

Now, if it were true that the growing liberalism on moral issues is mainly due to changing demographic composition, we should observe that the liberal trends disappear, or at least be greatly reduced, once demographic variables are controlled for. Yet, results of the analysis, show in Figure S5 do not support this claim. Similar to the unadjusted results, most issues

remain stable or show an upward trend in the proportion of liberal responses, with the exception of abortion. While these result cannot "prove" that individuals have changed their opinion, they significantly reduce the possibility that demographic compositional changes are the main driving force behind the surging liberalism on moral issues.

Figure S5: Predicted Proportions of Liberal Opinion Controlling for Demographic Changes, 1972-2016

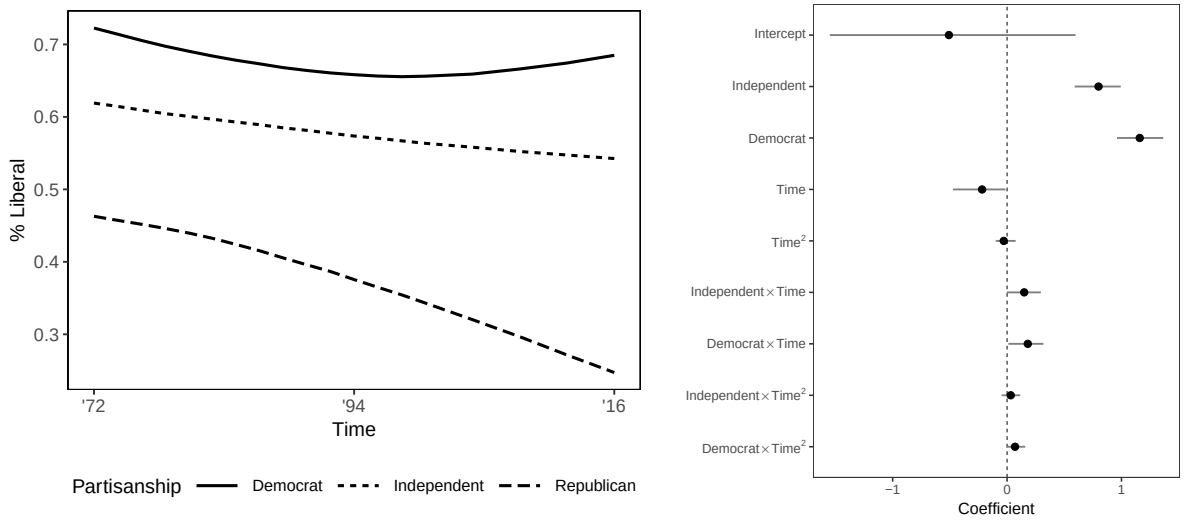


Notes: Red and blue lines, respectively, show the estimated proprtions for Republicans and Democrats. Shaded regions are 95% confidence intervals of the estimated proportions.

Analysis of Economic Issues: 'relative' vs. 'absolute' questions

It should be noted that all federal spending issues were measured in a "relative" manner. That is, respondents were asked whether they want "more" or "less" federal spending on each item, rather than the absolute amount of spending they prefer. Therefore, a constant trend on these issues might indicate that individuals have, in effect, become more liberal if federal spending on these items has increased over time. We deem this possibility unlikely, not only because respondents generally are not knowledgeable about the level of federal spending but because previous research has shown that aggregate trends in the economic domain are either stable or show cyclic behavior (e.g., Page and Shapiro 1992; Stimson 2004). However, we also analyzed only those economic issues that were asked in a "absolute" manner separately. Figure S6 shows the estimated aggregate trends as well as the corresponding regression coefficients when the analysis of economic domain is restricted to only those issues that were asked in a "non-relative" manner. This excluded all federal spending issues, which asked about whether the respondents want "more" or "less" spending on the items, as well as opinion regarding immigration and the government spending/service scale (`gov.spend.service`). Results of the analysis confirm that Democrats and Republicans are, on average, *not* becoming more liberal on these issue.

Figure S6: Estimated Average Trend on Economic Issues on Subset of Issues



Notes: 1) The coefficients and the predicted mean trend is estimated from a subset of economic issues, as outlined in footnote 8 of the main text. 2) Black dots and horizontal gray lines of the plot on the right show, respectively, posterior medians and 95% credible intervals of the coefficients.

References

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