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LONG-TERM RELIGIOUS SERVICE ATTENDANCE IN 66 COUNTRIES

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ABSTRACT

The attendance rate at religious services is an important variable for the sociology and economics of religion, but long-term and global data are scarce. Retrospective questions from the International Social Survey Program (ISSP) allow the construction of rates of religious-service attendance back as far as the 1920s in 66 countries, half from the "Global South." A number of checks support the reliability of the retrospective information. One exercise demonstrates the consistency between retrospective and contemporaneous survey data when the two overlap. Another procedure shows that the retrospective values are similar when generated from individual ISSP surveys for 1991, 1998, 2008, and 2018; that is, there is no clear dependence of memory on the number of years of recall. The new data document a century-long "Great Religious Divergence" between North and South. We use the data to carry out event studies for effects on religious-service attendance of two major events. Vatican II, in 1962-1965, triggered a decline in worldwide Catholic attendance relative to that in other denominations. In contrast, the endings of Communism in the early 1990s did not systematically affect religious-service attendance. Finally, in a large sample, religious-service attendance responds positively to wars and depressions.

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Attendance at formal religious services, often referred to as church attendance, is a key quantitative measure of religious participation. This variable has been used in many empirical studies in the sociology and economics of religion. A partial list of these studies is Bultena (1949), Lenski (1953), Lazerwitz (1961), Glock and Stark (1965), Azzi and Ehrenberg (1975), Iannaccone (1991), Finke and Stark (1992), Chaves and Cann (1992), Davie (1994), Iannaccone and Stark (1994), Chaves and Gorski (2001), Barro and McCleary (2003), McCleary and Barro (2006), Glaeser and Sacerdote (2008), Gruber and Hungerman (2008), Ruiter and van Turbergen (2009), Voas and Chaves (2016), Becker et al. (2017), Bentzen (2019), and Stolz et al. (2024).

A major shortcoming of the available data on religious-service attendance is the lack of long time series. Brenner (2016) summarizes the international data, particularly from the World Values Survey, henceforth WVS, and the International Social Survey Program, henceforth ISSP. These two international surveys provide attendance data starting, respectively, in 1981 and 1991.[1] In addition to the short time frames, these data are limited in their cross-sectional coverage because they are centered on what the United Nations calls the Global North.[2] Only three countries and one country, respectively, in the initial survey waves lie in the Global South. The coverage of these surveys is therefore too short and too narrow to capture the major historical trends in religious participation, such as the secularization of the West or the Global spread of Christianity, or to study the impact on religious participation from major events.

The present study dramatically extends the available international time-series data on religious-service attendance by using retrospective questions from the ISSP surveys; that is, questions on individuals' parental and own attendance during individuals' childhood. The original idea for this use of retrospective questions appeared in an unpublished paper by Iannaccone (2003). It allows us to produce long time series on monthly and weekly rates of adult and child attendance for 66 countries, 31 of which

[1]Longer time series for contemporaneous attendance at formal religious services exist for a handful of countries. Gallup (2024) has time-series data on weekly religious-service attendance rates for the United States since 1939. Similar data for Canada exist back to 1946.
[2]The Global North includes North America, Europe, Israel, Japan, South Korea, Australia, and New Zealand. The Global South includes Africa, Latin America, and the rest of Asia.

are in the Global South.[3] For many countries, data start as early as the 1920s or 1930s. These series reveal long-term trends globally, regionally, and for individual countries. We use an array of empirical approaches to support the reliability of these data. Then we study the causal impact of two major historical events that are conjectured to have impacted religious-service attendance: Vatican II in 1962-1965 and the ending of Communism in many countries in the early 1990s. We also gauge effects over large samples from wars, economic depressions, and Communism viewed more broadly.

We build our new data set from retrospective questions asked of 203,423 respondents in the four ISSP religion waves—1991, 1998, 2008, and 2018. These questions ask respondents how often they attended religious services in their childhood (more precisely, "when they [you] were around 11 or 12") and how often their father and mother attended religious services when the respondent was a child. Because the respondents were at varying ages when surveyed (from 14 to 105), the dates to which the retrospective data apply vary accordingly. For example, for someone aged 80 when surveyed in 1991, age 12 corresponds to 1923. Retrospective questions thereby allow for measurement of a long history of country- and year-specific average attendance rates.

We group the retrospective data into five-year intervals to account for the imprecision of recall.[4] Since we combine four survey waves taken at different points in time, a given target interval (say, 1958-1962) comprises data from respondents of as many as four different age ranges (in this case, aged around 45 in the 1991 wave, around 50 in 1998, 60 in 2008, and 70 in 2018), thereby decreasing the risk of cohort-related biases. We also report rates of attendance only when there are at least 20 underlying values in the relevant five-year interval. Despite this constraint, we were able to go back to the 1920s for 13 countries, the 1930s for 19 countries, and the 1940s for 13 countries, with an average sample of 371 respondents per country-period. For nearly all of these countries, no data previously existed on religious-service attendance prior to 1980, and most of these data started well after 1980.

[3]In addition, data are provided separately for East and West Germany.
[4]For example, the values reported for 1925 are the means of the values between 1923 and 1927. We discuss further in Section I the potential concerns regarding the reliability of recall.

Part I of this paper shows that the retrospective data provide a unique perspective on the long histories of religious participation across the world. One pattern is a striking divergence in trends between the Global North and the Global South, a pattern that qualifies as a "Great Religious Divergence." Average rates of monthly adult religious-service attendance in the two regions were comparable at the end of World War II at around 55%. Since then, attendance rates steadily decreased in the North, to reach 28% in 2010. In the South, it remained virtually unchanged—despite many of these countries experiencing rapid economic growth and political change. This diverging pattern give credence to studies that develop nuanced theories of secularization, such as Norris and Inglehart (2011) and Franck and Iannaccone (2014). At the same time, the numbers refute Stark's (1999, p.254) controversial claim that there is "no demonstrable long-term decline in European religious participation." The maintenance of rates of religious-service attendance in the Global South may relate in part to the spread of the Evangelical movement (Jenkins [2002]).

Another pattern in the data is the substantial variation in levels and trends of attendance rates across geographical regions, as well as across countries within regions. This heterogeneity calls for studies on the political, cultural, and economic features that underpin the patterns seen in the data. This paper undertakes some of these studies.

Before analyzing drivers of religious-service attendance, we take a number of steps to validate the quality of the ISSP retrospective data. These data have a number of advantages, aside from their unique ability to generate long time series. Because they are derived from a uniform set of questions at particular points in time, they avoid the changes in question formulations, interview methods, and response rates that plague cross-sections of contemporaneous surveys. Moreover, the data on parents refer to the behavior of other people, thus possibly circumventing the social-desirability bias that leads some existing data to suffer from over-reporting, as discussed in Brenner (2011) for the United States. Yet, retrospective data also suffer from their own potential biases, particularly regarding the accuracy of individual answers and in the sampling procedures. Recall is vulnerable to a set of projection, salience heuristic, and

forgetfulness biases. Moreover, the retrospective data typically include fewer observations per cell when compared to contemporaneous data and are restricted to individuals with surviving children.

Part II carries out tests to gauge the reliability of the retrospective ISSP information. The strategy starts by comparing the retrospective data with existing contemporaneous data that cover the same time periods. These contemporaneous sources include the ISSP (starting in 1991), the World Values Survey (starting in 1980), individual country post-election surveys collected by Gethin et al. (2022) (some of which have data on attendance since the 1970s), Gallup for the United States back to 1939, Gallup combined with other sources for Canada back to 1946, and Gallup for a cross section of countries in 1968. The second strategy considers the few other existing sources of retrospective religious-service attendance: the four waves of the ISSP considered individually, the 1981-1988 waves of the General Social Survey (GSS) for the United States, and the 2018 European Values Survey (EVS) wave (which asks about retrospective child attendance). A final strategy sets up a simple hierarchical model to produce Bayesian estimates of attendance and uses these estimates as a comparison group. Our overall conclusion is that the ISSP retrospective data prove reliable, particularly in capturing broad time trends.

Part III discusses applications of the new data for understanding effects on religious-service attendance from major historical events. The first application covers the Second Ecumenical Council of the Vatican or "Vatican II." Between 1962 and 1965, around 3,000 bishops, theologians and heads of religious orders congregated in the Vatican to discuss the state of the Catholic doctrine and its relationship with modernity. The unanticipated, major reforms that resulted from the Council (perhaps the most famous being the end of the Latin-only mass) profoundly affected Catholic faith and practice, to the point that sociologists refer to the event as "the most significant example of institutionalized religious change since the Reformation" (Wilde [2007, p. 2]). The event has been linked to declining monastic orders in the United States (Gihleb and Giuntella [2017]) and Europe (Berman, et al. [2018]), but consequences for religious participation of Catholic adherents across the world have yet to be assessed.

Using an event-study design, we find that rates of religious-service attendance in predominantly Catholic countries started to decrease relative to those of all other countries and to those of other Christian

countries precisely in the aftermath of Vatican II. This result holds for adult and child religious-service attendance and also holds when using the share of a country's catholic adherents as a continuous measure of a country's exposure. Overall, the Catholic relative attendance rate fell by four percentage points per decade between 1965 and 2015. This pattern is consistent with religion modeled as a club good (Iannaccone [1992]) and with the view that Vatican II shattered the perception of an immovable, truth-holding Church (Greeley [2004], MacCulloch [2010]). More generally, these results might explain why many religious authorities are reluctant to modernize their doctrine or reduce barriers to religious participation.

Another major political and institutional shock to religion across the world was Communism. Almost invariably, the attitude of Communist regimes toward religions and their institutions has been one of suppression. The methods varied in nature and intensity across states, but almost always resulted in measurable declines in religious adherence and participation (Tomka [1998], Froese [2008]). In that context, the collapse of Communism toward the end of the 20th century represented a major moment forward for the freedom of religious practice, of which the consequences for religious-service attendance are ambiguous. Several studies have provided evidence of increased religiosity in some post-Soviet countries (Greeley [2002], Froese [2004a], Tomka [2011], Evans and Northmore-Ball [2012, 2016], and Breskaya and Zrinscak [2024]). But, in part because large-scale cross-country surveys that covered the former Communist countries became available only in the 1990s or later, studies have been limited in their ability to establish a causal link between the end of Communism and patterns of religiosity.

Using, again, an event-study design, we study the 16 former Communist countries in our sample to see whether there is evidence for a significant rebound in religious participation, when compared to other countries, following the end of Communism in the early 1990s. Religious-service attendance rates in Communist countries might have increased in relative terms by a few percentage points during the 1990s, but this trend often reversed in the 2000s. The recovery in religious-service attendance does look stronger for children than for adults. However, the overall evidence for a rebound in religious-service attendance is weak.

Finally, we find evidence from a large sample for positive influences of war and economic depression on religious-service participation. Cases of adverse economic shocks positively impacting religiosity have been documented in many contexts (see, for example, Chen [2010], Belloc, Drago, and Galbiati [2016], and Ager, et al. [2024]). We show that this result holds for the countries in our sample when looking at the universe of wartime conflicts and economic depressions from 1920 to 2010. This exercise relies on data on war incidence from *Historical Conflict Event Dataset* (Miller [2022]) and on data on real GDP from Barro and Ursua (2008). Within five years, the religious-service attendance rate tends to rise by 1.1 percentage points in response to a war, to rise by 0.5 percentage points in response to an economic depression, and to fall by 1.8 percentage points in response to the introduction of Communism. The responses to war and depression may arise because religion helps people to deal with adversity, possibly because of social-insurance provision or through psychological support.

Aside from improving our understanding of the drivers of religious-service attendance, these applications are suggestive of the many ways that the newly available long-term data can be used. Part IV concludes by providing suggestions for these future uses.

I. Long-Term Patterns in Rates of Religious-Service Attendance

A. The Data

The International Social Survey Program, or ISSP, has conducted surveys in each of its member states annually since 1985.[5] The focus of the survey varies over time, but religion was the main theme in the waves of 1991, 1998, 2008, and 2018. Questionnaires are designed by a central committee and administered locally by "fieldwork institutes"—typically centered in research universities. The exact sampling procedures and interview methods vary slightly from one country to another, but they are always designed to ensure nationally representative samples and careful completion. The program is

[5]The data can be accessed at gesis.org/en/issp/data-and-documentation.

highly respected as a paradigm for carrying out international surveys and has already interviewed over a million people. See Smith and Schapiro (2021) for a detailed discussion of the ISSP religion waves.

The four ISSP waves on religion include retrospective questions about parental and child religious-service attendance.[6] The questions read: "When you were a child, how often did your father/mother attend religious services?" (two separate questions); and "And what about when you were around 11 or 12, how often did you attend religious services then?" The respondent chooses a single answer from the following list: Never; Less than once a year; About once or twice a year; Several times a year; About once a month; 2-3 times a month; Nearly every week; Every week; Several times a week; or No mother (father)/mother (father) not present/Can't say. We defined individual monthly attendance of mother (father) as an indicator variable taking the value one when the respondent answers "About once a month" or a category with more frequent attendance. We defined individual weekly attendance of mother (father) when the respondent answers "Nearly every week" or a category with more frequent attendance. We leave these variables as missing when the answer is No mother (father)/mother (father) not present/Can't say. Overall, we use information from 197,630 individuals. The retrospective attendance number is missing in 1.7%, 8.6%, and 11.6% of cases, respectively, for attendance of child, mother, and father.

Because the respondents were at varying ages when surveyed, the dates to which the retrospective data apply, which we take to correspond to age 12, vary accordingly. For example, for someone aged 80 when surveyed in 1991, age 12 corresponds to 1923. The range of ages in the surveys goes from 14 to 105, but 18 is the minimum age for most countries. To account for the imprecision of individual recall and perceptions of when they "were a child," we combined target years into five-year intervals. Finally, to obtain country time series, we calculated the mean of the individual attendance rates that corresponds

[6]The ISSP contains two additional retrospective questions. One asks about the religion that the respondent adhered to while being raised. That question was used in Barro, Hwang, and McCleary (2010) to gauge rates of religious conversion across countries and over time. Another question concerns belief in God: "Which best describes your beliefs about God? 1. I don't believe in God now and I never have. 2. I don't believe in God now, but I used to. 3. I believe in God now, but I didn't use to. 4. I believe in God now and I always have." This question does not pin down the precise timing to which the earlier belief applies.

to a given target interval in each country. Taking the 1960 target as an example, we combined data, when available, from each country's respondents who were aged 41-45 in 1991 with those aged 48-52 in 1998, 58-62 in 2008, and 68-72 in 2018.[7] Finally, parental attendance is the mean of father and mother attendance.

Because a few data points (often the earliest ones) tend to have relatively few underlying observations and are, therefore, likely to be unreliable, we report rates of religious-service attendance only when there were at least 20 underlying values for the relevant individuals (mothers/fathers/children) in the applicable five-year interval. For parents, we require at least 20 underlying values of either mother or father. The number of underlying observations in each country-interval bin for parents varies from 20 to 742, with a mean of 203 and a median of 167. For children, the number varies from 20 to 845, with a mean of 202 and a median of 160.

Despite the various constraints, the data for parents (adults) go back to 1920 for 4 countries, 1925 for 7 countries, 1930 for 7 countries, 1935 for 12 countries, and 1940 for 8 countries. Table 1 shows the list of countries in the sample along with the starting dates for usable retrospective data on adult (i.e., parent) and child attendance rates. We will make these data available in a data set that also includes the available contemporaneous data from the ISSP and the WVS.

Advantages & Risks of Retrospective data

There are a number of advantages of using retrospective data to study long-term trends in behavior, in particular, religious-service attendance. Cross-sectional contemporaneous data suffer from changes in question formulations, interview methods, and response rates. In contrast, the retrospective data come from a small set of survey waves carried out in similar fashion and asking the same question over time and across countries. Moreover, religious-service attendance is a norm-heavy behavior that

[7]In practice, we used the precise year in which each survey was conducted in a particular country—some of these years differed from 1991, 1998, 2008, or 2018. No values were entered when a country did not participate in a particular survey wave.

might suffer from a wide array of reporting biases, starting with social desirability. In fact, Brenner (2011) shows that church attendance in the United States tends to be substantially over-reported in contemporaneous surveys. Though retrospective data are not shielded from this risk, it is plausible that, because it refers to the past and to someone else's behavior (in this case of parents), these biases are smaller, or at least not unidirectional. Most importantly, retrospective data allow us to study time periods when no contemporaneous survey exists, as is true for the great majority of countries before the 1980s.

However, retrospective data have their own risks and issues. Broadly, these issues can be separated into two categories. The first one is the reliability of the individual answers, in light of the biases documented by the literature in psychology (Kahneman, et al. [1982]). Individuals might bias their answers toward their current behavior or toward their previous observations to protect their cognitive consistency ("projection"), or toward what they believe is conventional wisdom or socially desirable. Parental religious-service attendance being a salient feature of an individual's childhood, they could also be subject to a *salience heuristic*, whereby people overstate the probability or prevalence of events that they can readily visualize or easily recall. Finally, retrospective information may simply have been forgotten or altered with time, especially when referring to events in the distant past, as for the oldest respondents in our sample.

The second category of disadvantages of retrospective data relates to issues of sampling. Because they divide contemporary surveys into age groups, sample sizes of each observation (in our case, country x 5-year intervals) are typically smaller than if a complete contemporaneous survey was run at that time. Further, the mothers and fathers that respondents are referring to in their answers are not a representative sample of the country's population; they necessarily refer to people who had at least one child (and the more children they had, the more likely they are to appear in the sample).

Section II runs a series of tests to assess the likely size and direction of these potential biases. The general conclusion is that, for researchers whose primary goal is to generate a profile of aggregate trends and turning points, retrospective methods typically yield reliable information.

B. Patterns in the Long-Term Data on Rates of Religious-Service Attendance

Monthly, Weekly, Father's, Mother's, Child's attendance: the United States

Figure 1 illustrates the nature of the retrospective data on rates of religious-service attendance by showing in Panel (a) the U.S. monthly and weekly attendance rates for adults (parents in the retrospective data). The overall mean of the U.S. monthly rate of adult religious-service attendance from 1920 to 2010 is 63%, which is high compared to that in other countries. For example, for 2010, when the U.S. rate is 59%, the mean in the 66 countries with data is 40% and that for 20 rich countries (those with 2010 real per capita GDP in 2017 dollars above $30,000) is only 28%. Also, compared to many rich countries, the U.S. rate of religious-service attendance is relatively stable: from 1920 to 2010, the monthly attendance rate decreased from 70% to 59%. This phenomenon has sometimes been referred to as "American exceptionalism" (see, e.g., Lipset [1991]) and is still currently debated (Brenner [2011], Voas & Chaves [2016]).

The pattern for U.S. adult weekly religious-service attendance rates in Figure 1 is similar to that for monthly attendance. The close co-movements between monthly and weekly attendance is a regular feature of the data. The U.S. mean monthly attendance rate of 63% compares to 50% for weekly attendance. For the monthly and weekly attendance rates in the full sample of countries, the respective means are 47% and 35%. The gap between average monthly and weekly attendance rates of 12 percentage points is close to that, 13 percentage points, for the United States.

The retrospective data allow also for a breakdown of rates of religious-service attendance between males and females (that is, fathers and mothers) and between adults and children (where children can also be separated by gender). Panel (b) of Figure 1 shows some of these breakdowns for the United States. From 1930 to 2010, female attendance in the United States is higher than male on average by 14 percentage points; for the full sample of countries, this gap is 7 percentage points. For the United States from 1920 to 2010, the mean monthly rate of religious-service attendance is 77% for children, that is, 14 percentage points higher than that for adults. One mechanical reason that attendance rates for children tend to exceed those for adults is that children sometimes attend religious services with only one parent.

Another reason is the religious schooling and other religion-related activities undertaken by children in many countries.

The time series for monthly and weekly attendance rates for fathers, mothers, and children often follow different patterns. In the United States, the adult-child attendance gap varies from 22 percentage points at the end of World War II to 6 percentage points in 2010.

Trends in attendance across the world: Local variation and the Great Religious Divergence

Figures 2 to 5 show patterns of adult monthly religious-service attendance rates across the world. In Figure 2, we use two grouping of countries to highlight two central patterns about global attendance revealed by our data. Panel (a) uses the UNCTAD classification to distinguish between the Global North (in our data, 35 countries) and Global South (31 countries). What appears is a "Great Religious Divergence." Adult monthly attendance rates in the Global North dramatically decreased from 63% in 1925 to 26% in 2010. This decline corresponds to the well-known secularization of the West. In contrast, for countries of the Global South, the religious-service attendance rate has remained reasonably stable since at least 1950, oscillating between 50% and 55%. This divergence was noted by Norris and Inglehart (2011) for the 1980s onwards. Our data show the longer-term roots of this phenomenon.

Figure 2, Panel (b), groups countries by geographic regions. Echoing the results of Panel (a), the regions aside from Europe and, to some extent, Latin America (and North America, which is not shown in the figure) display stable attendance over time. However, regions differ dramatically in their level of attendance. The average adult monthly attendance rate in East Asia/Pacific Region is 27%, while in Sub-Saharan Africa it is 82%. Between these two extremes, Europe has an average of 43%, Middle East/North Africa 47%, South Asia 56% and Latin America 58%. In other words, religious participation displays great heterogeneity across the world and has done so for a century.

Figure 3 has monthly rates of adult religious-service attendance for European countries. Many of them exhibit the classic secularization pattern whereby a once reasonably high attendance rate —such as 55% in France in 1930 and 80% in Germany in 1920 — was followed by a persistent decline —to reach

10% for France and 30% for Germany in 2010.[8] Some countries, such as Italy, Portugal, and Ireland show a long-term decline but one that, when compared to other Western European countries, is less drastic and with higher levels of attendance throughout. In 2000 in Ireland, attendance was still at 84%. In contrast, the attendance rates in Scandinavian countries (Finland, Iceland, Norway, Sweden, and Denmark) were already relatively low in the 1930s and seem to have reached a lower bound by the 1970s at around 10-15%. Note that, in no European country did monthly religious attendance fully die out.

Figure 3 also displays adult rates of monthly attendance in the former Communist countries of Eastern Europe. Poland is an outlier with very high attendance rates through World War II and under Communism, dropping only from 97% in 1930 to 85% in 2000, the last date available. In contrast, several countries have sharply declining attendance rates throughout. For example, from 1930 to 1990, Hungary went from 85% to 18%, and the Czech Republic went from 67% to 11%. In the former Yugoslavian countries of Croatia and Slovenia, the decrease seems to have been halted by the 1990s at rates of 43% and 37%, respectively. Russia and its close neighbors (Ukraine, Georgia, and the Baltic countries) started the period with comparatively low attendance rates (30% for Russia in 1935) and those rates decreased until the 1980s, reaching 4% in Russia in 1990. Subsequently, some countries, such as Estonia and Georgia, show signs of recovery, but not others, such as Slovakia and the Czech Republic. Overall, as will be shown in Section III.b., there is no strong evidence of a systematic revival of religious participation after the demise of Communism in the early 1990s.

Figure 4 applies to Asian and African countries. South and South East Asian countries show stark differences in their levels and trends of adult rates of monthly attendance. The Philippines has a stable religious-service attendance rate since the 1920s, at an average of 88%. In Cambodia and Thailand, attendance rates fell from, respectively, 51% and 77% in 1965, to 22% and 58% in 2010. On the other end, attendance rates increased in Nepal and Singapore from, respectively, 17% and 29% in 1965 to 33% and 51% in 2010.

[8]The data for Germany up to 1945 come from population-weighted averages of the ISSP retrospective data obtained from surveys carried out in West and East Germany.

Figure 4 includes six predominantly Muslim countries: Algeria, Indonesia, Jordan, Malaysia, Tunisia, and Turkey. Trends and levels in rates of adult monthly attendance differ greatly among these countries.[9] Indonesia exhibits high (above 80%) and roughly flat rates of attendance, while rates are increasing in Tunisia, Algeria, and Malaysia. Only Turkey had a steady, slow decline, from 76% in 1945 to 63% in 2010.

Among the East Asia/Pacific countries, Australia, New Zealand, Taiwan, and South Korea display moderate and stable attendance. Japan has the lowest attendance rates of this group, mostly less than 20%, with rates below 10% since 1965. In contrast, the six Sub-Saharan African countries in the sample (Ghana, Kenya, Malawi, Nigeria, Tanzania, and South Africa) have high adult rates of monthly attendance, above 60%, and for Ghana, Kenya, and Tanzania, the rates are still rising. Kenya, for instance, went from 67% attendance in 1960 (prior to its independence in 1963) to 88% in 2010.

Finally, Figure 5 shows adult religious-service attendance rates for eight Latin American countries. Most of them exhibit slowly declining attendance rates but at different levels. Nicaragua went from 80% in 1940 to 69% in 1990, while Uruguay went from 31% in 1940 to 21% in 2000. Only Brazil seems to follow a different path, with an attendance rate that increased from 64% in 1935 to 77% in 1990.

Overall, the ISSP retrospective data show a lot of variation across regions and countries in levels and trends of religious-service attendance rates. Many of these variations call for further investigation. Section III uses the data to carry out three studies along these lines. However, before using the data, we document in the next section that the retrospective data can be viewed as reliable.

II. Validation of the Retrospective Attendance Data

As discussed above, the use of retrospective data raises concerns about the validity of recall, particularly over the long intervals that date back to a person's childhood. Therefore, it is important to

[9]Note that, although women are permitted to attend mosques in most Muslim countries, this attendance tends to be voluntary, unlike that for men. This differential treatment likely explains why monthly adult attendance rates at religious services in the six Muslim countries from 1955 to 2010 averaged only 49% for women versus 65% for men. In contrast, the female rate is higher on average in this period for the full set of countries (50% versus 43%).

assess the reliability of this information. In this section, we conduct a number of exercises to support the validity of the retrospective data on religious-service attendance.[10]

A. Comparisons with Contemporaneous Surveys

Multi-country surveys

ISSP. The most direct test for the retrospective data is to compare with ISSP contemporaneous data when the measures are available for the same dates. There are 60 cases across 36 countries for adult religious-service attendance rates for 1990, 2000, and 2010 for which contemporaneous ISSP survey data match up with ISSP retrospective data. Because the retrospective data on adults (fathers and mothers) are necessarily restricted to include only persons who had at least one child (and were more likely to have two or more children) and were in an age range where they had a child aged 11 or 12, the comparison uses contemporaneous attendance of adults who were between 30 and 60 and had at least one child. A minor caveat is the small difference in the way the ISSP questions were asked: the retrospective questions ask about attendance at religious services, whereas the contemporaneous questions ask typically about attendance aside from weddings, funerals, and baptisms. Despite this difference, the high correlation between the retrospective and contemporaneous data, 0.93 for monthly adult attendance rates, suggests that the retrospective data are reliable.[11] In a regression of the retrospective variable on the contemporaneous one, the estimated coefficient is 1.008 (s.e.=0.052), with an R-squared of 0.86. As expected, given the difference in the questions, there is some divergence in levels: the mean of monthly

[10]A different issue is that a respondent's parents or the respondent may have been living in a different country during the respondent's childhood. In that case, the retrospective attendance information would be associated with the wrong country. We can assess this issue quantitatively with the data from the ISSP 2018 wave, which asked whether the respondent's parents were of foreign origin. If we compare the monthly religious-service attendance rates of parents for all respondents with that for respondents who say that the particular parent was of domestic origin, the mean for 666 observations is 42.6% for all respondents and 42.3% for those of domestic origin. The correlation between the two series is 0.993. Results are similar for weekly attendance. Therefore, this issue seems not to be important in practice.

[11] When computing country-year measures of average attendance with contemporaneous data, we use the country-specific weights provided by the surveyors to ensure representativeness of the sample. Because these weights apply to respondent-specific characteristics, such as gender and age, we do *not* use them for information computed from retrospective data.

adult religious-service attendance rates for the retrospective data is 36.3%, compared to 31.9% for the contemporaneous data.[12] Figure 6 plots all the observations and shows the strong association between the retrospective and contemporaneous values.

WVS. We can further assess the validity of the ISSP retrospective data by comparing with contemporaneous data from WVS surveys. There are 118 cases across 48 countries for adult religious-service attendance rates for 1980, 1990, 1995, 2000, 2005, 2010, and 2015 for which contemporaneous WVS survey data match up with ISSP retrospective data. The comparison again uses contemporaneous information for persons restricted to an age range from 30 to 60 with at least one child. The correlation between the ISSP retrospective and WVS contemporaneous data is high, 0.90 for monthly adult attendance rates. The means, in the sample with data in common, for ISSP retrospective monthly attendance rates is 41.6%, compared to 40.1% for the contemporaneous WVS data.[13] In a regression of the retrospective ISSP variable on the contemporaneous WVS variable, the estimated coefficient is 0.887 (s.e.=0.037), with an R-squared of 0.81. Figure 7 plots all the observations and shows the strong association between the retrospective and contemporaneous values.

Gallup 1968 report. A similar comparison can be done for 11 countries from a 1968 survey by Gallup.[14] Figure 8 shows weekly adult religious-service attendance rates for this sample. The Gallup data refer to regular attendance on a weekly basis. These numbers from Gallup are very close to those calculated from the ISSP retrospective data. The mean attendance rates (using 1968 for Gallup and the

[12]The results are almost identical if we measure the contemporaneous ISSP attendance from the full adult population, rather than from those who were aged between 30 and 60 with at least one child. The mean of the variable for the full population is 32.5%, and the correlation with the ISSP retrospective values is 0.88.
[13]The results are again almost identical if we measure the contemporaneous WVS attendance from the full adult population. The mean of this variable is 39.5%, and the correlation with the ISSP retrospective values is 0.90.
[14]The data are reported in Sigelman (1977, Table 4). He indicates that the question asked was: "Do you attend church in a typical week?" Data were reported for 12 countries, but Greece is not included in any of the ISSP survey waves.

five-year interval around 1970 for ISSP) are 26.8% from Gallup and 29.4% from ISSP, and the correlation is 0.97.

Country-specific time-series

Electoral surveys. In many countries, surveys administered at times of national elections include respondents' religious-service attendance rates. Gethin, et al. (2022) cover these surveys for 21 Western countries between 1948 and 2020. In eight of these countries, shown in Figure 9, the surveys include consistent time series of religious-service attendance that go back before 1990. The exact dates and questions for each country are shown in Appendix Table B1. Each country reports, for each election year, the average rate of weekly and/or monthly attendance (depending on data availability).[15] Figure 9 compares the ISSP retrospective data with these estimates for adult weekly attendance rates in Panel (a) and for adult monthly attendance rates in Panel (b). In each country, the two series follow each other closely.

Gallup U.S. time series. Gallup (2024) provides contemporaneous survey data on U.S. weekly religious-service attendance rates back to 1939. The question asked of adults aged 18 and over is: "Did you, yourself, happen to attend church, synagogue, mosque or temple in the last seven days or not?"[16] This question is not precisely comparable to those asked by the ISSP and WVS, because a person who usually attends services less frequently than weekly might happen to have attended in the last seven days. On this count, the Gallup responses would tend to overstate regular weekly attendance. However, an offsetting force is that a person who usually attends weekly might happen to have missed services in the last seven days. In practice, the results from the Gallup question about attendance in the last seven days are very close to those reported by Gallup on weekly religious-service attendance rates in data gathered

[15]As before, we focus on adults aged 30 to 60. Unfortunately, there is no consistent variable to condition on having children.

[16]The survey was carried out in 1939, 1940, 1950, 1954-55, 1957-58, 1962, 1967, 1969, 1972, 1979, 1981-83, 1985, and all years for 1987-2023.

since 1992 for a concept that parallels the one employed by the ISSP and WVS. From 1992 to 2023 (with 1993 missing), the mean of the last-seven-days question is 38.4% and that for the more standard measure is 39.2%, and the correlation between the two series is 0.93.

Figure 10 shows the patterns since 1939 in U.S. weekly adult religious-service attendance rates from Gallup and from ISSP retrospective data. We use the Gallup data averaged over five-year intervals to make them comparable with the ISSP data. The graphs show a close correspondence between the two series. Note that Glenn (1987) argues that the Gallup surveys taken before the mid-1950s did not adequately construct representative samples; notably the surveys under-counted women, southerners, and blacks—groups that tend to have above-average attendance rates. Consistent with this assessment, the attendance rates shown for Gallup in Figure 10 for 1940 and 1950 are those furthest below the ISSP values.

Canada surveys. Data on weekly religious-service attendance rates in Canada are available for 1946 and for years from 1955 to 2023 from Hiemstra and Stiller (2013, Figure 1, and updated data provided by these authors). The underlying surveys were conducted by Gallup, GSS Canada, and others, much of which is reported in ODESI (odesi.ca/en), a public opinion poll archive housed by the University of Toronto. We combine questions that ask about attendance in the last seven days with those that ask about regular weekly attendance. We then group the data into five-year intervals to make them comparable to the ISSP information. Figure 11 compares the Canadian contemporaneous survey data with the ISSP retrospective data. As with the United States, the two graphs for Canada show a close correspondence.

B. Comparisons with Alternative Sources of Retrospective Data

Individual ISSP survey waves. Our time-series data on religious-service attendance rates combine retrospective information from the four waves on religion of the ISSP: 1991, 1998, 2008, and 2018. One check on the reliability of these data comes from comparing retrospective values obtained

from each individual wave of the ISSP. As an example, for the target year 1960, we can compare retrospective values generated from the survey for 1991 with those from the surveys for 1998, 2008, and 2018. Specifically, for adults (corresponding to recollections about attendance of parents), there are 18 countries in common in the 1991 and 1998 surveys that have the retrospective data for 1960, 17 in common in the 1991 and 2008 surveys, 11 in common in 1991 and 2018, 17 in common in 1998 and 2008, 22 in common in 1998 and 2018, and 21 in common in 2008 and 2018. These comparisons reveal whether the remembered frequency of religious-service attendance for a given target year tends to rise or fall as the number of years from the event increases.

Table 2 brings out the main information by focusing on comparisons for the ISSP 1991 and 2008 waves and for the ISSP 1998 and 2018 waves. The upper panel refers to monthly adult religious-service attendance rates and the lower panel to monthly child attendance rates. The complete set of survey pairs for adult attendance is in Appendix Table B2.

Consider, for example, the 1991 and 2008 ISSP waves, focusing in Table 2 on the period from 1940 to 1985, where there are at least 10 countries in common for each retrospective year for adults (parents) and children (oneself as a child). The mean values over this period for adults are similar when coming from the two ISSP waves separated by 17 years: 52.5% from ISSP 1991 and 53.9% from ISSP 2008. The means of the two values for children are also close: 67.1% from ISSP 1991 and 65.8% from ISSP 2008. For the 1998 and 2018 ISSP waves, we focus on the period from 1945 to 1990, where there are at least 10 countries in common for each retrospective year for adults and children. Again, there are no clear patterns of change in the retrospective values as the target year varies. The mean values over this period for adults are 39.7% from ISSP 1998 and 40.2% from ISSP 2018, whereas those for children are 50.7% from ISSP 1998 and 48.2% from ISSP 2018. Overall, the main finding from the full set of information in Appendix Table B2 is that there is a lot of stability in memories of religious-service attendance as the time elapsed from the target date varies.

U.S. General Social Survey. The General Social Survey (GSS), applicable to the United States, integrated with the ISSP for the ISSP's initial survey of religion in 1991. Before that date—in 1983, 1984, 1985, 1986, and 1988—the GSS conducted independent surveys. These surveys included retrospective questions concerning attendance at formal religious services by the respondent's father and mother when the respondent was a child.[17] Therefore, these data provide retrospective information on adult attendance at religious services, analogous to those described before for the ISSP. The GSS and ISSP retrospective monthly adult attendance rates from 1920 to 1980 are compared in Appendix Figure C1. The two time series provide a similar picture for religious-service attendance rates.

In addition, because its surveys pre-dated those from the ISSP, the GSS provides U.S. retrospective information for adult (parent) attendance back to 1905. The monthly adult attendance rates are 83% in 1905, 77% in 1910, and 77% in 1915, compared to 71% in 1920.

European Values Survey. The European Values Survey (EVS) integrated with the World Values Survey (WVS) with the 2018 wave. Before that, the EVS conducted independent surveys of European countries. These surveys included retrospective questions concerning attendance at religious services by the respondent when the respondent was a child. Therefore, these data provide retrospective information on child attendance at religious services, analogous to those described before for the ISSP.

From 1925 to 2010, for 32 countries, there are 491 retrospective observations in common for the EVS and ISSP for child religious-service attendance. The mean monthly attendance rates are 49.6% for the EVS and 49.1% for the ISSP, with a correlation of 0.97. The corresponding values for weekly attendance are 41.3% for EVS and 37.8% for ISSP, with a correlation of 0.97. Therefore, the EVS as an alternative source of child retrospective information provides a picture for religious-service attendance between 1925 and 2010 that is similar to that provided by the ISSP.

[17]Our understanding is that Andrew Greeley persuaded the GSS to incorporate these retrospective questions about parental religious-service attendance starting in 1983. These questions, along with one referring to attendance when one was a child, were carried over to the ISSP when it started in 1991.

C. Bayesian Estimation of Attendance Rates

Another way to check the validity of our estimates from the retrospective data is to compare them with estimates obtained through a Bayesian procedure that allows for measurement error in the observations (such as cohort- and gender-specific biases). This approach is pursued in Part A of the Appendix. The bottom line is that some of the suspected biases in the retrospective data may exist, but the magnitudes are small, and the constructed data are reliable, particularly in terms of broad trends.

III. Determinants of Religious-Service Attendance Rates

This section uses the new data to study drivers of religious-service attendance. We carry out event studies for two major historical events: Vatican II (1962-1965) and the ending of Communism in the early 1990s. We also use regression analysis for a panel of countries over the long term to assess effects from negative shocks associated with war and economic depression.

A. The Second Ecumenical Council of the Vatican or "Vatican II"

The Vatican Council known as Vatican II was announced by Pope John XXIII in 1959, shortly after he became pope in October 1958.[18] After three years of preparation, the Council convened in the fall of 1962. After John XXIII died in June 1963, the new pope, Paul VI, quickly determined that the Council would continue. In total, Vatican II spanned four annual sessions in the fall between 1962 and 1965. Its main objective was to assess and update the Church's doctrines to achieve an alignment with the fast-evolving, partly secularized modern world. More than 2200 bishops and hundreds of theologians and heads of religious orders congregated in the Vatican to discuss aspects of the Catholic faith and its practices.

[18]The first Vatican council or Vatican I was convened by Pope Pius IX in 1868 and was held in 1869-1870 before being terminated because of the invasion of Rome and the ending of the Papal States during the Franco-Prussian War. The more important Council of Trent was held in the context of the Catholic Counter-Reformation in 1545-1563.

Greeley (2004, pp. 54-57) observed that Vatican II resulted in five major changes in Church operations, which he described as follows. First was the change in liturgy, whereby the mass was now carried out with the priest facing the congregation and in the local language rather than Latin. Second was ecumenism, whereby Protestant denominations were recognized as churches and "heretics" such as Jews were viewed as separated brothers and sisters. Third was the abolition of a series of required individual practices, such as "fish on Fridays." Fourth were discussions of birth control, eventually removed by Paul VI from conciliar discussions and left to a commission, whose liberal proposals were rejected by the Pope. In this regard, Greeley (p. 56) says: "It was this development, more than any other, that shattered the authority structure." Fifth was an allowance for priests to leave the priesthood and enter valid marriages, often with former nuns. Many other significant reforms were considered, including eliminating celibacy for priests, but were not enacted.

The general view is that Vatican II constituted a momentous change for the Catholic Church. Wilde (2007, p. 2) refers to Vatican II as "the most significant example of institutionalized religious change since the Reformation." Greeley (2004, p. 8) describes the event as a "Catholic Revolution."

Conceptually, the impacts of the changes from Vatican II on religious participation are ambiguous. A partially modernized Church could be seen as popular with individuals and thus as more attractive in a competitive market for religion. On the other hand, as has been argued by Iannaccone (1992), participation in formal religious services can be understood through the logic of club goods, for which utility derives partly from their exclusivity combined with enthusiastic participation by persons with similar behavior and attitudes. In this context, elements such as the opening of the mass and the enhancement of dialogue with other religions could have withdrawn the types of barriers that helped to maintain active church participation by Catholics. Moreover, as Greeley (2004. P. 56) has argued, the explicit questioning of centuries-old doctrines, such as the forbidding of birth control, may have shattered the perception of an immovable, truth-holding Church and replaced it with a model whereby individuals had a more direct relationship with God and were, therefore, less dependent on the Church and its formal services.

Hout and Greeley (1987, Table 6) argue that this last force dominated for Catholics in the United States. They found from Gallup data on weekly church attendance that the attendance rate for U.S. Catholics fell from 68% in 1966, just after the completion of Vatican II, to 52% in 1978 and then remained flat through 1984, the last year of their study. They attribute the declining part of the attendance rate particularly to Paul VI's encyclical on birth control in 1968, a pronouncement that reflected the divisive discussions during Vatican II. Other studies have found additional dimensions in which Vatican II could have depressed religious participation by Catholics. Berman, et al. (2018, p. 154) say: " … the Second Vatican Council led to broad-based institutional decline within Catholicism. The losses included reductions in the number of people becoming or remaining priests, even larger reductions in the number of nuns…" They argue further that Vatican II's depressing influence on the number of nuns led to a sharp decline in fertility among Catholics because of the loss of childbearing support. Along similar lines, Gihleb and Giuntella (2017, p. 192) say: "the Vatican II reforms in the early 1960s inadvertently produced a dramatic change in the cost/benefit ratio of religious life and drained Catholic schools of critical human capital. Between 1966 and 1980, the number of Catholic sisters (nuns) was reduced by more than 30%. This unexpected collapse was followed by a parallel decline in the number of Catholic schools in operation."

We apply an event-study framework to our new data to assess the impact of Vatican II on the religious-service attendance rate for Catholics compared to non-Catholics in a large sample of countries. Our analysis relies on the observation that Vatican II would primarily influence the behavior of Catholics, notably in their rates of church attendance. In our main procedure, we define a country as "Catholic" if the share of its population (according to Barrett [1982]) that adhered to Catholicism in 1900 was 50% or more.[19] We use the data from 1900 because the available adherence rates for 1970 or later may have responded endogenously to Vatican II. In any event, the results are similar if we use Catholic adherence

[19]Appendix Table B3 shows the countries in our sample entering that category.

rates for 1970. The results are also similar if we use a continuous measure of the Catholic adherence rate, rather than a dummy variable for whether the rate exceeded one-half.

An important point is that the occurrence and outcomes of Vatican II were largely unanticipated (Wilde [2004, 2007], MacCulloch [2010], O'Malley [2010]). When he initiated the Council in 1959, John XXIII had recently been elected and was viewed as an interim pope. Moreover, he was described as a person of "old age and simple nature" who was expected largely to maintain the status quo of the Catholic Church (Wilde [2007, p. 3]). Further, once Vatican II was proposed and then convened, most observers thought that the Council would lead to few changes, as was true for the previous Council in 1869-1870. This perception reflected in part the sustained power of conservative clergy among the Curia and the lack of recent crises that would demand fundamental reform. Yet a set of factors allowed progressive participants of the Council to secure a consensus on several of their proposals and, thus, to the surprise of most observers, obtain the series of major reforms noted by Greeley (2004). For our purposes, the main point is that, with Vatican II unanticipated, changes in religious-service attendance rates would not have occurred earlier in anticipation of Vatican II, and the subsequent changes in attendance would have been unanticipated. This setup is particularly appropriate for our event-study design.

We estimate the following standard specification for an event study:

$$(1) \qquad Y_{it} = \mu_{4-} + \sum_{k=-3}^{-2} \mu_k + \sum_{k=0}^{4} \mu_k + \mu_{5+} + \theta_t + \gamma_i + X_{it} + \varepsilon_{it}$$

where Y_{it} is the religious-service attendance rate in country *i* in decade *t*. We set up the analysis in terms of decades to obtain clear estimates of long-term impacts, but the results are similar if we instead use five-year periods. Each decade starts at year "5," for example, decade -1 is for 1955-1964, just before Vatican II. The coefficients μ_k, for $-3 \leqslant \mathrm{k} \leqslant 4$, are indicators for each decade relative to decade -1 for Catholic countries, μ_{4-} and μ_{5+} are indicators for Catholic countries corresponding to 4 or more or 5 or more decades before and after decade 0, θ_t is a decade fixed effect, γ_i is a country fixed effect, and X_{it}

represents time-varying country-level controls (for which we use total population, average number of years of schooling, infant mortality rate, real GDP growth rate, and the presence of Communism). The coefficients of interest, $\mu_0, \mu_1, \mu_2, \mu_3, \mu_4$, measure the impact of Vatican II for a Catholic country compared to a non-Catholic country, all relative to the omitted value μ_{-1}. The coefficients μ_{-2}, μ_{-3} test for pre-trends. We cluster standard errors at the country level.

The main event-study results for Vatican II are in Figure 12. (Appendix Table B4 shows the estimated coefficients.) Panel (a) includes all countries in our sample and bases the concept of a country being Catholic on whether the Catholic share of the population in 1900 was at least 50%. The results show that, compared to other countries, Catholic countries experienced a steady decline in the monthly adult religious-service attendance rate starting immediately after Vatican II. The effect is statistically significant at the 1 percent level and sizable in every decade. The attendance rate is lower in each decade by an average of 4 percentage points (almost 10% of the attendance mean over the period). Moreover, before Vatican II, the attendance rate did not follow a significantly different pattern in Catholic countries, indicating the absence of pre-trends in the data.

Figure 12, Panel (*b)* compares the predominantly Catholic countries with a sample of predominantly Christian countries. That is, the comparison here is between a Catholic country and a Protestant or Orthodox country. Importantly, the relative decline in monthly adult attendance rates for Catholic countries is similar to that found in Panel (a), where the comparison was with all countries. The results in Panel (b) imply that the decline in attendance rates for Catholic countries constitutes a change relative to Christian countries that are not predominantly Catholic. In other words, the decline in attendance is specific to Catholicism, to which Vatican II would directly apply.

Appendix Figure C2, Panel (*a)* shows that the results are essentially the same when a country's Catholicism is computed from a continuous measure of its adherence share in 1900, rather than as a dummy variable for whether the adherence share was at least 50%. The results (not shown in the figures) are also basically the same if Catholic adherence is based on data from Barrett (1982) for 1970, rather than 1900. Appendix Figure C2, Panel (*b)* shows that the findings are similar when based on monthly

child religious-service attendance rates. That is, the negative influence of Vatican II on religious-service attendance in Catholic countries did not show up differentially for adults (parents) compared to younger persons (children). (Note that our data do not provide information on specific ages of the parents.)

B. The Ending of Communism in the Early 1990s

Table 3 shows that our sample comprises 16 former Communist countries, consisting of 7 former republics of the Soviet Union, 2 countries that were previously part of Yugoslavia, 6 other Eastern European countries that were dominated by the Soviet Union, and Cambodia. Many of these countries had pursued vigorous policies to eliminate or at least diminish organized religion, likely because religious institutions were viewed as competitive with the state. This process applied particularly to the Soviet Union since the 1920s, East Germany since the end of World War II, and China (not in our sample) since the late 1940s. Froese (2004b) discusses these anti-religion efforts from the perspective of "scientific atheism" in the Soviet Union, and Froese and Pfaff (2005) apply an analogous perspective to atheism and secularism in East Germany. Anti-religion policies were more moderate in the former Yugoslavia (Croatia and Slovenia in our sample) and in some of the other Eastern European countries, notably Poland since the end of World War II. Madsen (2013) discusses these cases, as well as the Soviet Union.

Despite the heterogeneity in treatment among former Communist countries, the main point is that Communism tended to depress religion, especially organized religion. Consistent with this observation, a reasonable expectation is that the elimination of Communism in the early 1990s would tend to generate recovery of formal religion. In fact, several existing studies argue that this recovery typically took place—see Froese (2004a) on the former Soviet Union, Tomka (2011) on Eastern Europe, and Evans and Northmore-Ball (2012) on Russia. However, event-study results, based on the application of our new data to 16 former Communist countries when compared to 51 other countries, indicates that participation in adult religious-service attendance did not systematically recover following the ending of the Communist regimes.

Conceptually, the response of formal religion to the ending of Communism is ambiguous. On the one hand, Communism's fall would permit the comeback of popular churches and leaders, thereby promoting a revival of religiosity, gauged particularly by rates of religious-service attendance. On the other hand, decades of lack of religious participation and the evolution of secular beliefs might have suppressed the ability of religious leaders to mobilize their members, to the extent that potential members still existed.

Table 3 shows characteristics of the 16 Communist countries. The table gives the rough year of imposition of Communism and the rates of monthly adult and child religious-service attendance at three dates (when available): the year of onset of Communism, 1990, and 2010. Note that the imposition of Communism goes back to the 1920s for the Soviet Union and Yugoslavia and applies during and after World War II for some of the Soviet republics and the other eastern European countries.

We cannot use an event study to assess the effects from the imposition of Communism because data on religious-service attendance rates are missing for many of the relevant time periods and because the timing of the introduction of Communism varies across the countries. However, Table 3 shows clearly that the religious-service attendance rate in 1990 was typically much lower than that applying around the time of the introduction of Communism.

We can implement an event-study design to assess the effects on religious-service attendance rates from the elimination of Communism in the early 1990s due particularly to the breakups of the Soviet Union and Yugoslavia. These events apply at roughly the same point in time for all of the 16 former Communist countries. Moreover, as with Vatican II, the ending of Communism can be plausibly viewed as an unanticipated event. The breakup of the Soviet Union seems, in particular, to have been largely unexpected.

Analogous to Eq. (1), we estimate a standard specification for an event study associated with the ending of Communism in the early 1990s:

$$(2) \qquad Y_{it} = \mu_{5-} + \sum_{k=-4}^{-2} \mu_k + \sum_{k=0}^{3} \mu_k + \mu_{4+} + \theta_t + \gamma_i + X_{it} + \varepsilon_{it}$$

where Y_{it}, now measured in five-year intervals, is the religious-service attendance rate in country *i* in period *t*. We use periods of five, rather than ten, years to allow for a substantial number of periods from the event in the early 1990s up to the end of the sample around 2010. However, the conclusions are similar with ten-year periods. The coefficients μ_k, for $-4 \leqslant \mathrm{k} \leqslant 3$, associate with 5-year periods relative to period -1 (1988-1992) for former Communist countries. The coefficients μ_{5-} and μ_{4+} are for former Communist countries corresponding to 5 and 4 or more, respectively, of periods before and after period *0*, θ_t is a period fixed effect, γ_i is a country fixed effect, and X_{it} represents time-varying country-level controls. The coefficients of interest, $\mu_0, \mu_1, \mu_2, \mu_3$, measure the impact of ending Communism, relative to the omitted value μ_{-1}. The coefficients $\mu_{-2}, \mu_{-3}, \mu_{-4}$ test for pre-trends. We again cluster standard errors at the country level.

The main event-study results for the ending of Communism are in Figure 13. (The estimated coefficients are shown in Appendix Table B5.) Figure 13, Panel (*a)* shows that the point estimates indicate little difference in adult monthly religious-service attendance rates between the 1990 baseline period and the following periods for former Communist countries compared to the full sample of other countries. Attendance might have increased by three percentage points in 2000 but only to go back to the initial level in 2005. Results in Appendix Figure C3 show similar results for adult attendance when the comparison is with a sample restricted to European countries (Panel *a*) and when looking at weekly attendance (Panel *b*).

The results for child attendance in Figure 13, Panel (*b)* shows a greater tendency for attendance rates to rise following the ending of Communism. The estimated coefficients are all positive for the periods from 1995 to 2010, and the one for 2000 is significantly different from zero at the 95% level with a point estimate of seven percentage points. Thus, it may be that the ending of Communism had its main positive effect on religious participation of children. This result may be driven by the behavior of religious institutions, such as reintroduction of religious education and religious practices in schools.

It is apparent from Table 3 that the patterns of change in monthly religious-service attendance rates after 1990 differ substantially across the former Communist countries. Some countries see increases in adult attendance rates from 1990 to 2010—notably Bulgaria, Estonia, Georgia, Mongolia, and Russia. However, others see declines—particularly Cambodia, Czech Republic, Lithuania, Poland, and Slovakia. Froese and Pfaff (2001) offer a special explanation for why Poland experienced declines in religious-service attendance rates following the eliminations of Communist rule. They note the high levels of religious participation under Nazi and Communist rule, where the Catholic Church managed to become the center of opposition to the oppressive governments. When this role ended in the early 1990s, the decline in religious participation followed.

Northmore-Ball and Evans (2016) extend this reasoning to argue for fundamental differences between Orthodox and Catholic churches' relationship to the Communist state, and hence between the potential for revived attendance after the end of Communism. Results in Appendix Figure C4 support this argument by showing that Orthodox countries experienced an increase in religious-service attendance rates after 1990, by about ten percentage points, while other treated countries did not. This jump seems to be stable up to 2010.

C. Short-Term Responses to Adverse Shocks: War and Economic Depression

Many studies have examined the responses of indicators of religiosity to shocks. Examples are the Nile floods in Egypt from 1169 to 1425 (Chaney [2013]), earthquakes in Italian municipalities from 1000 to 1300 (Belloc, Drago, and Galbiati [2016]), the Asian Financial Crisis in Indonesia (Chen [2010]), the 1927 Great Mississippi flood (Ager, et al. [2024]), weather shocks and persecutions of Jews in Europe from 1100 to 1800 (Anderson, Johnson, and Koyama [2017]), and impacts of media revelations of sex-abuse scandals on religious participation of Catholics in the United States from 1990 to 2010 (Bottan and Perez-Truglia [2015]). In this spirit, we seek to use our new long-term panel data to analyze responses of religious-service attendance rates to wars and economic depressions. Our expectation, consistent with

findings in the literature about responses to other forms of adverse shocks, is that war and depression would stimulate religiosity, specifically raise rates of religious-service attendance.

Unlike our analyses of Vatican II and the ending of Communism, an event-study design does not work for an assessment of the responses of religious-service attendance rates to war and depression. One problem is that wars and depressions occur at varying times and in varying intensities in our panel of data. A second problem is that, unlike Vatican II and the ending of Communism, wars and depressions tend to be transitory. Given these two issues, we have to rely on regression analysis to isolate effects on religious-service attendance rates. This analysis is less secure in terms of providing convincing identification, but the main effects nevertheless emerge clearly.

For war, we construct a dummy variable at five-year intervals for the presence of a "major war." The main source of data is *Historical Conflict Event Dataset* (Miller [2022]). We use, in addition, Project Mars (Lyall [2020]), which is an extension of the earlier data set called "Correlates of War." For the 804 observations in our regression sample from 1930 to 2020, 192 associate with a war (at a 5- or 10-year lag). 117 of these 192 relate to World War II, the Vietnam War, the Korean War, or World War I, and 69 associate with conflicts in Latin America.

For economic depression, we use an updated version of the sizes of macroeconomic disaster events calculated by Barro and Ursua (2008). These numbers correspond to cumulative proportionate contractions in real per capita GDP over a period of one or more years corresponding to economic contraction. The sample of events was constrained to consider only major contractions, defined as cumulative declines by 10% or more. The computed values were then assigned to associated years arranged at five-year intervals from 1920 to 2020. For the 804 observations in our regression sample, 192 associate with a major economic depression (at a 5- or 10-year lag). 64 of these 192 relate to World War II, the Vietnam War, the Korean War, or World War I, and 30 associate with conflicts in Latin America. 24 associate with the Great Depression. Hence, war is, in fact, the major source of economic depression.

Table 4 has panel regressions with the adult or child monthly religious-service attendance rate as the dependent variable, Y_{it}.[20] The estimation takes the form

$$(3) \qquad Y_{it} = \beta_0 + \beta_1 \cdot War_{it-1,2} + \beta_2 \cdot Depress_{it-1,2} + \beta_3 \cdot Communism_{it-1,2}$$
$$+\beta_4 \cdot VAT_t \cdot Share\ Catholic_i + \beta_5 \cdot Y_{it-5} + \beta_6 \cdot Y_{it-10} + \gamma_i + \eta_t + \varepsilon_{it}$$

where $War_{it-1,2}$, $Depress_{it-1,2}$, and $Communism_{it-1,2}$ are, respectively, sums of five- and ten-year lags of the war dummy, the measure of economic depression, and the presence of Communism.[21] Analogous to Figure 12, the variable related to Vatican II is the interaction of years since the end of the Vatican II Council, VAT_t, with the fraction of a country's population that was Catholic in 1900, $Share\ Catholic_i$. Finally, the specification includes 5- and 10-year lags of the dependent variable, country and period fixed effects, and a standard error term.

Consider first the results for adult religious-service attendance rates in Table 4, column 1. This regression includes country fixed effects. The results are broadly similar in column 2 with the addition of period fixed effects.

In Table 4, column 1, the estimated coefficient of the lagged war dummy is positive and significant at the 5% critical value. A switch from 0 to 1 in this variable is estimated to raise the religious-service attendance rate after ten years by 0.011, compared to the standard deviation of the attendance rate of 0.26. (The value 0.011 factors in the coefficient of 0.43 on the five-year lag of the dependent variable.)

The estimated coefficient of the lagged economic-depression variable is also positive and statistically significant at the 5% level. A rise by one standard deviation in this variable—by 0.12—is estimated to raise the attendance rate after 10 years by 0.005, compared to the standard deviation of 0.26.

[20]The findings are similar if we add as explanatory variables a set of standard control variables— total population, average number of years of schooling, infant mortality rate, and real GDP rate.
[21]The findings are similar, though less transparent, if separate coefficients are estimated on the five- and ten-year lags.

(The value 0.005 again factors in the coefficient of 0.43 on the five-year lag of the dependent variable.)[22] The previous discussion of war and depression makes clear that the war and depression variables are positively correlated (correlation = 0.33). Nevertheless, the coefficients of these two variables are individually statistically significantly different from zero in the regression in Table 4, column 1.

The estimated coefficient of the lagged Communism variable is negative and statistically significant at the 1% level. The results imply that the imposition of Communism reduces the religious-service attendance rate after ten years by 0.018, compared to the standard deviation of 0.26. (This result also factors in the coefficient of 0.43 on the five-year lag of the dependent variable.) In this regression setting, the predicted effects of implementing and removing Communism would be symmetric. However, our event study of ending Communism in Figure 13 found that eliminating Communism did not have a statistically significant effect on monthly adult religious-service attendance rates. Therefore, it is likely that the effects of Communism that show up in Table 4 have more to do with implementing Communism than with eliminating it.

The regression results show a negative effect, statistically significant at the 1% level, for the Vatican II variable. These results are analogous to the event-study findings in Figure 12.

The coefficients on the five- and ten-year lags of the dependent variable are each positive and statistically significant at the 1% level. These coefficients imply gradual responses of religious-service attendance rates to changes in the other explanatory variables.

Table 4, column 3 and 4, shows that the results are broadly similar if child attendance rates are used instead of adult attendance rates as the dependent variable. There is some suggestion that child attendance is more sensitive to economic depression and less sensitive to war, when compared to adult attendance.

[22]The results are virtually the same if, instead of entering the depression variable in a continuous way, one enters this variable as a dummy for whether the amount of contraction is 0.10 or more.

IV. Conclusions

In his review of the topic of church attendance, Brenen (2016) notes: "*extension of this research program into the developing world is desperately needed*." The main contribution of this study is to use ISSP retrospective survey questions to construct long-term measures of adult and child religious-service attendance rates for 66 countries, half of them lying outside of the West. These data go back as far as 1920. We have generated monthly and weekly attendance rates broken down by gender and by adults versus children.

We think these data will be useful for many researchers in the sociology and economics of religion. We have already found that they allow for analyses of important outstanding issues concerning the determinants of religious-service attendance rates: the Vatican II council, which ended in 1965, had large negative effects on adult religious-service attendance rates by Catholics; while the ending of Communism in 16 countries in the early 1990s shows no clear effects on adult religious-service attendance.

Many questions remain. In addition to particular country trajectories, we still do not understand well the causes of global trends like the spread of Reformed Christian movements in Latin America and Sub-Saharan Africa, or the religious intensity in many Muslim countries. One unique aspect of our data is that they provide estimates of attendance of children, for which patterns and relationships with adult attendance have yet to be studied in detail.

Table 1
Countries and Starting Dates in ISSP Retrospective Samples

Code	Country	Starting date for adults (parents)	Starting date for children
AT	Austria	1925	1925
AU	Australia	1925	1925
BE	Belgium	1940	1940
BG	Bulgaria	1935	1935
BR	Brazil	1935	1935
CA	Canada	1935	1935
CH	Switzerland	1935	1935
CL	Chile	1930	1930
CY	Cyprus	1940	1940
CZ	Czech Republic	1935	1935
DE	Germany*	1920	1920
DE-E	Germany East	1925	1920
DE-W	Germany West	1925	1920
DK	Denmark	1930	1925
DO	Dominican Republic	1945	1945
DZ	Algeria	1965	1965
ES	Spain	1925	1925
EE	Estonia	1950	1945
FI	Finland	1945	1945
FR	France	1930	1930
GB	Great Britain	1920	1920
GE	Georgia	1945	1945
GH	Ghana	1960	1960
HR	Croatia	1940	1940
HU	Hungary	1925	1925
ID	Indonesia	1950	1950
IE	Ireland	1925	1925
IL	Israel	1930	1930
IS	Iceland	1950	1945
IT	Italy	1930	1930
JO	Jordan	1950	1950
JP	Japan	1930	1930
KE	Kenya	1950	1950
KH	Cambodia	1955	1955
KR	South Korea	1940	1940
LK	Sri Lanka	1955	1955
LT	Lithuania	1950	1950
LV	Latvia	1935	1935

MN	Mongolia	1955	1955
MW	Malawi	1965	1965
MX	Mexico	1945	1940
MY	Malaysia	1960	1960
NG	Nigeria	1975	1975
NI	Nicaragua	1925	1925
NL	Netherlands	1920	1920
NO	Norway	1925	1925
NP	Nepal	1955	1955
NZ	New Zealand	1925	1925
PH	Philippines	1930	1930
PL	Poland	1935	1930
PT	Portugal	1935	1935
RU	Russia	1935	1925
SE	Sweden	1935	1935
SG	Singapore	1950	1950
SI	Slovenia	1935	1935
SK	Slovakia	1935	1935
SR	Suriname	1960	1955
TH	Thailand	1960	1960
TR	Turkey	1945	1945
TN	Tunisia	1960	1960
TW	Taiwan	1940	1935
TZ	Tanzania	1965	1960
UA	Ukraine	1940	1940
US	United States	1920	1920
UY	Uruguay	1940	1940
VE	Venezuela	1960	1950
VN	Vietnam	1950	1950
ZA	South Africa	1940	1940

*We constructed data back to 1920 for Germany by using the available data for East and West Germany, weighted by the shares of these regions in the total German population in 1991.

Note: The starting date is the earliest one for each country for parents or children for which data generated from retrospective questions in the four ISSP survey waves on religion (for 1991, 1998, 2008, and 2018) are available to gauge religious-service attendance rates. We used information for parents only when there were at least 20 underlying values for mothers or fathers applying to the five-year interval around the particular date. Similarly, we used data for children only when there were at least 20 underlying values.

Table 2

Observations in Common and ISSP Survey Years for Each Retrospective Year

Adult Monthly Religious-Service Attendance Rate (percent)						
Retro Year	**N**	**ISSP 1991**	**ISSP 2008**	**N**	**ISSP 1998**	**ISSP 2018**
1935	8	62.8	55.2	--	--	--
1940	14	61.3	63.2	1	31.0	49.0
1945	16	59.2	58.2	11	50.8	48.5
1950	17	55.8	56	18	46.2	47.6
1955	17	53.2	56.4	21	43.6	42.7
1960	17	52.1	55.8	22	41.2	42.4
1965	17	51.5	53.9	22	40.2	41.4
1970	17	48.2	51.2	22	39.2	39.6
1975	17	45.8	50.4	22	36.6	37.6
1980	17	46	46.4	22	35.9	34.7
1985	13	51.8	47.5	22	31.2	34.6
1990				22	32.3	33
1995	--	--	--	3	15	13
1940-85		52.5	53.9	1945-90	39.7	40.2

Child Monthly Religious-Service Attendance Rate (percent)						
Retro Year	**N**	**ISSP 1991**	**ISSP 2008**	**N**	**ISSP 1998**	**ISSP 2018**
1930	1	90	80	--	--	--
1935	8	81.1	82.4	--	--	--
1940	14	78.7	80.2	1	65	70
1945	17	75.2	72.8	13	66.2	58.8
1950	17	74.9	72.6	18	58	56.5
1955	17	72.4	69.6	22	58.3	55
1960	17	69	68.7	22	52.5	50.6
1965	17	66.7	65.2	22	51.3	49.9
1970	17	61.9	60.7	22	48.9	47.4
1975	17	58.2	57.4	22	46	45.1
1980	17	56.6	54.2	22	44.8	40
1985	14	57.6	56.6	22	40.9	40.3
1990	--	--	--	22	40.3	38.2
1995	--	--	--	3	16	17.3
1940-85		67.1	65.8	1945-90	50.7	48.2

Note: For each retrospective year, the columns show the number, *N*, of observations in common and the mean adult and child monthly religious-service attendance rates for ISSP 1991 and 2008 and for ISSP 1998 and 2018. Appendix Table B2 shows the full set of pairings applying to the upper part of the table.

Table 3

Characteristics of Former Communist Countries

Country	Onset of Communism	Adult Religious-Service Attendance Rate			Child Religious-Service Attendance Rate		
		Onset	1990	2010	Onset	1990	2010
Bulgaria	1945	38	9	12	31	3	13
Cambodia	1975	40	36	22	12	13	10
Croatia	1920	72 (1940)	43	47	87 (1940)	69	74
Czech Republic	1945	57	11	4	70	13	0
East Germany	1945	28	7	8*	42	10	0
Estonia	1940	9 (1950)	3	14	30 (1945)	15	11
Georgia	1920	27 (1945)	22	34	16 (1945)	19	48
Hungary	1945	69	18	18	91	31	24
Latvia	1940	39	9	10*	45	11	12 (2000)
Lithuania	1940	64 (1950)	36	22	72 (1950)	33	20
Mongolia	1925	5 (1955)	7	15	4 (1955)	2	5
Poland	1945	92	82	65*	95	95	96 (2000)
Russia	1920	27 (1930)	4	6	50 (1925)	3	7
Slovakia	1945	85	46	27	92	51	16
Slovenia	1920	81 (1935)	43	42	92 (1935)	60	63
Ukraine	1920	27 (1940)	23	24*	24 (1940)	15	26 (2000)

Notes: The onset of Communism is a rough date corresponding to Kornai (1992, Table 1.1). Religious-service attendance rate is the percent of adults or children attending at least monthly in the indicated year, using ISSP retrospective data.

*Based on ISSP contemporaneous data.

Table 4

Regressions for Monthly Religious-Service Attendance Rate

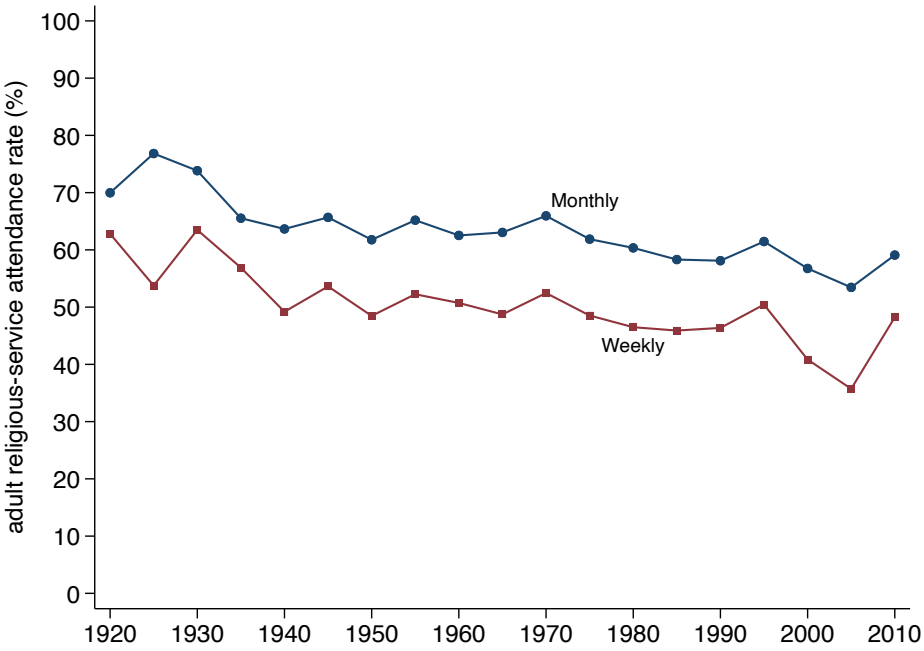
	Adults (1)	**Adults (2)**	**Children (3)**	**Children (4)**
War	0.0074**	0.0073*	0.0009	0.0013
	(0.0034)	(0.0039)	(0.0037)	(0.0042)
Economic depression	0.035**	0.020	0.059***	0.039**
	(0.015)	(0.016)	(0.016)	(0.018)
Communism	-0.0161***	-0.0164***	-0.0122***	-0.0125***
	(0.0041)	(0.0045)	(0.0046)	(0.0050)
Post-Vatican II x Share Catholic	-0.0027***	-0.0033***	-0.0026***	-0.0034***
	(0.0004)	(0.0005)	(0.0005)	(0.0005)
5-year lag of attendance	0.430***	0.425***	0.598***	0.590***
	(0.034)	(0.035)	(0.036)	(0.037)
10-year lag of attendance	0.271***	0.275***	0.224***	0.232***
	(0.032)	(0.033)	(0.034)	(0.035)
Country fixed effect	Yes	Yes	Yes	Yes
5-Year fixed effect	No	Yes	No	Yes
R-squared	0.973	0.974	0.976	0.977
σ	0.045	0.044	0.049	0.048
Number of countries	67	67	67	67
Number of observations	797	797	802	802

Note: The regression takes the form of Eq. (3) in the text. The dependent variable is the fraction of adults or children attending religious services at least monthly, based on the ISSP retrospective information. Data are from 1930 to 2015, observed at five-year intervals. Estimation includes country fixed effects. Columns 2 and 4 also include period fixed effects. Standard errors of coefficient estimates are in parentheses. The war dummy is a dummy for the presence of major war. Economic depression is the fractional decline in real per capita GDP, subject to a decline being at least 0.10 in magnitude. Communism is a dummy for the presence of a Communist regime. The Vatican II variable is the interaction of years since 1965 (the end year of the Vatican II Council) with the fraction of a country's population that was Catholic in 1900.

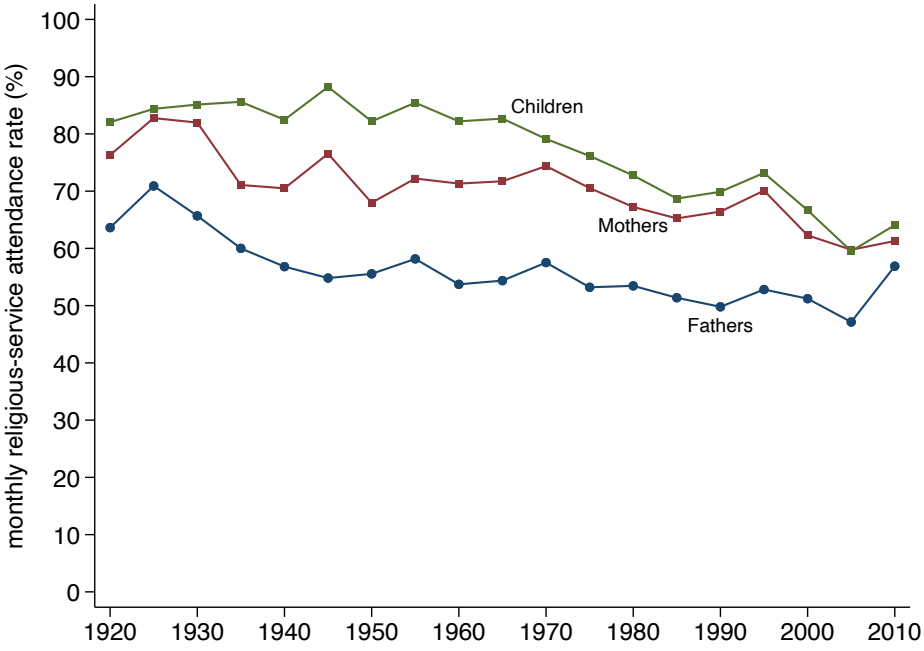
***Significant at 1%, **significant at 5%, *significant at 10%.

Figure 1 Religious-Service Attendance Rate in the United States

Panel (*a*): Monthly vs. Weekly



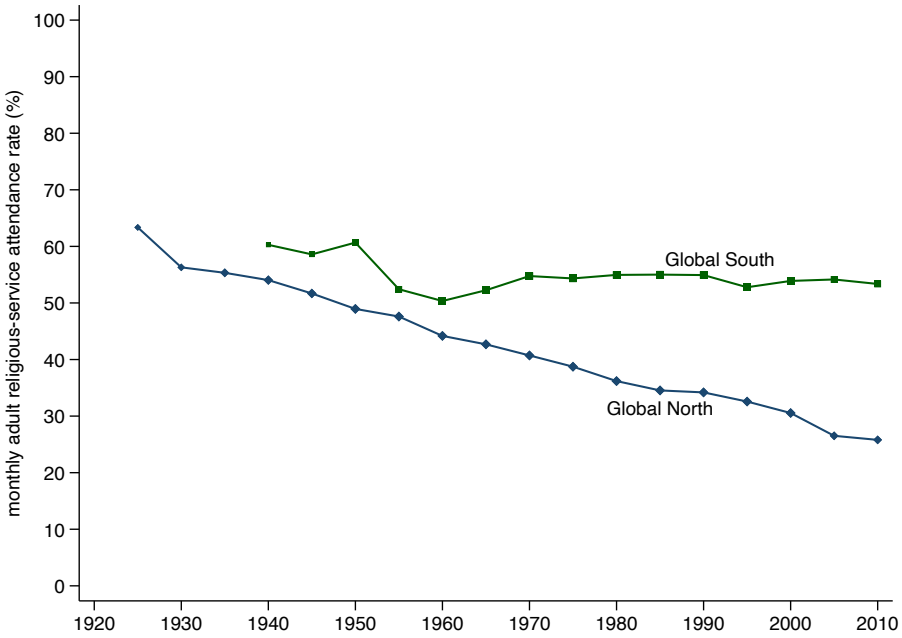
Panel (*b*): Monthly Attendance by Group



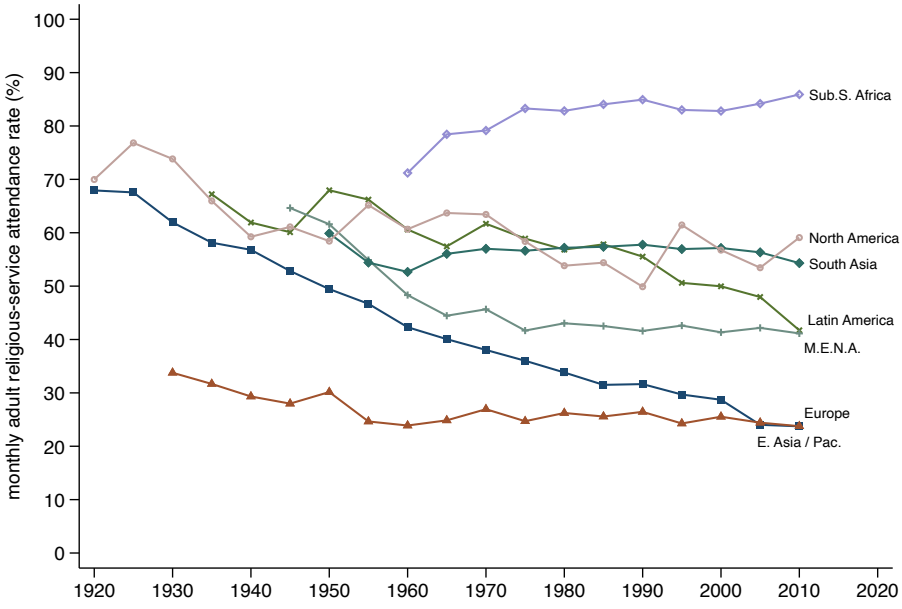
Note: The figures plot the religious-service attendance rate at a five-year interval, based on retrospective questions of the ISSP.

Figure 2 Monthly Religious-Service Attendance Rate across the World

Panel (*a*): By hemisphere



Panel (*b*): By region



Note: The figures plot the average religious-service attendance rate at five-year intervals for countries of different groups. In Panel (*a*) the groups are based on the Global North/South definition of UCTAD (U.N. Trade and Development). The averages are shown only when computed for five or more countries. In Panel (*b*) the averages are shown only when computed for three or more countries (except for North America). Data are from retrospective questions of the ISSP.

Figure 3 Religious-Service Attendance Rate by Countries in Europe

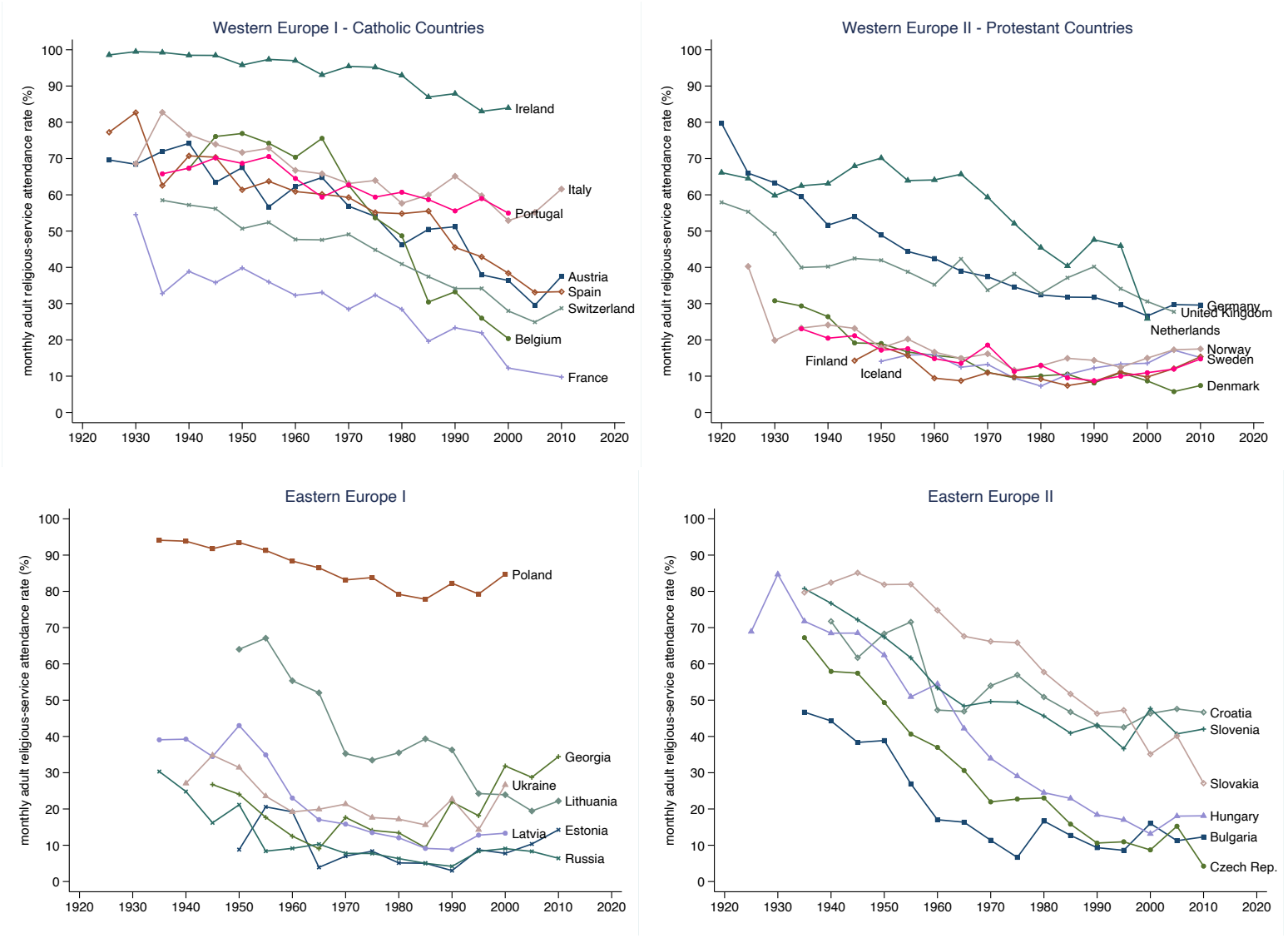
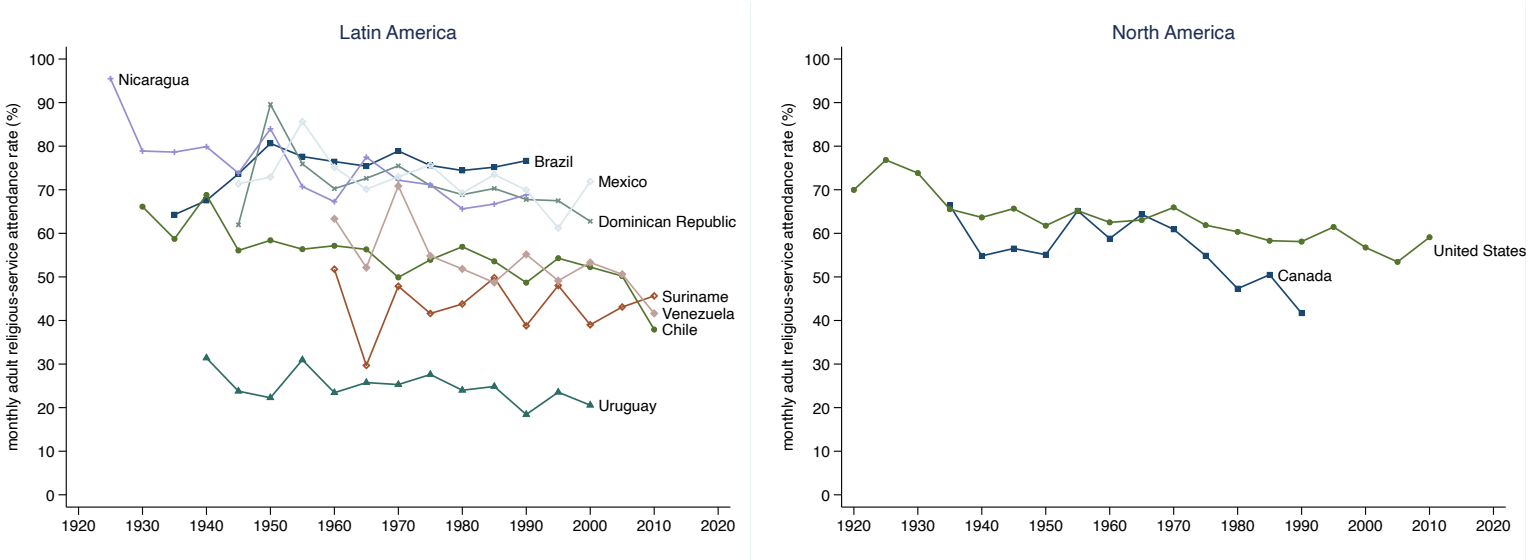


Figure 4 Religious-Service Attendance Rate by Countries in Asia, Africa, and Oceania

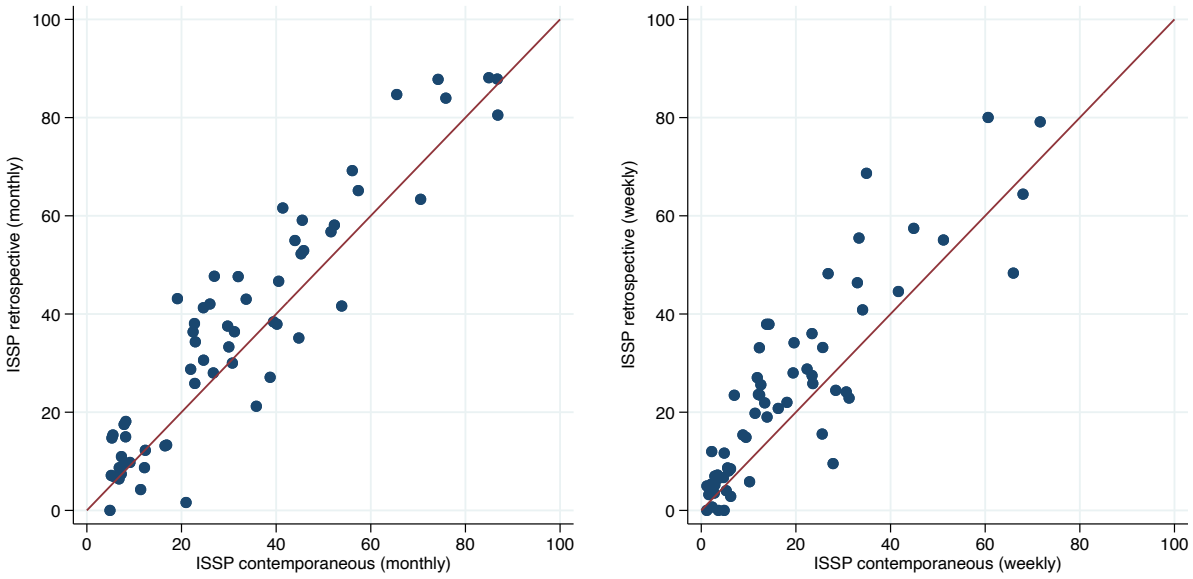
Figure 5 Religious-Service Attendance Rate by Countries in America



Note: Figures 3 to 5 plot the average religious-service attendance rate at five-year intervals for each individual country in our sample. Data are from retrospective questions of the ISSP.

Figure 6

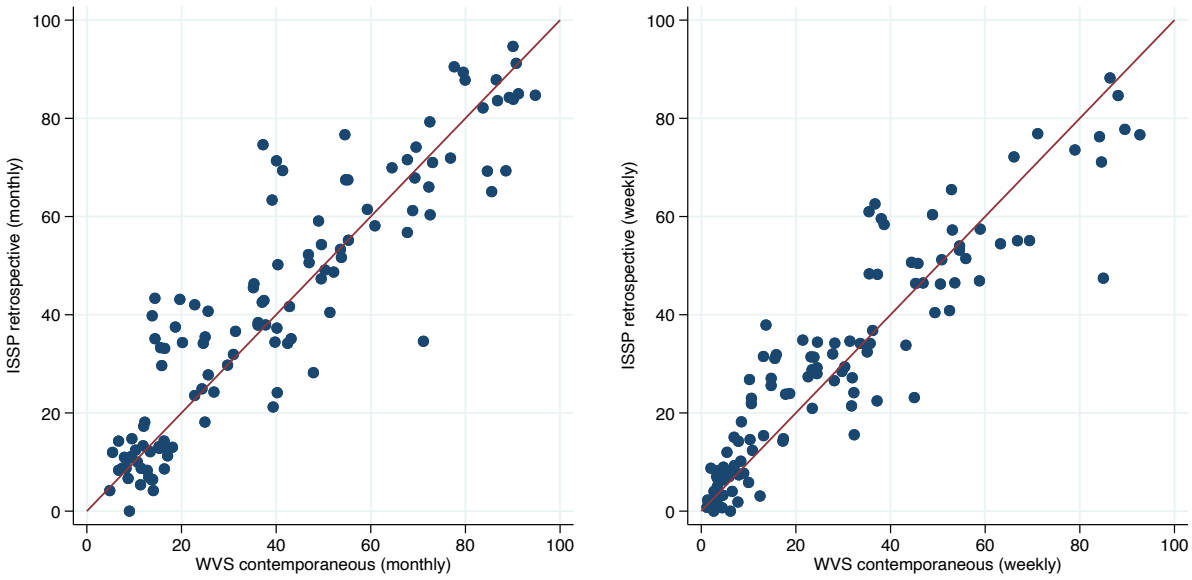
ISSP Retrospective vs. ISSP Contemporaneous (1990-2010)



Note: The figures plot the relationship between the adult religious-service attendance rate from ISSP retrospective data against that from ISSP contemporaneous data. A 45-degree line is shown for reference. The data are for monthly attendance (left graph) and weekly attendance (right graph). The contemporaneous data are for persons aged 30 to 60 with at least one child.

Figure 7

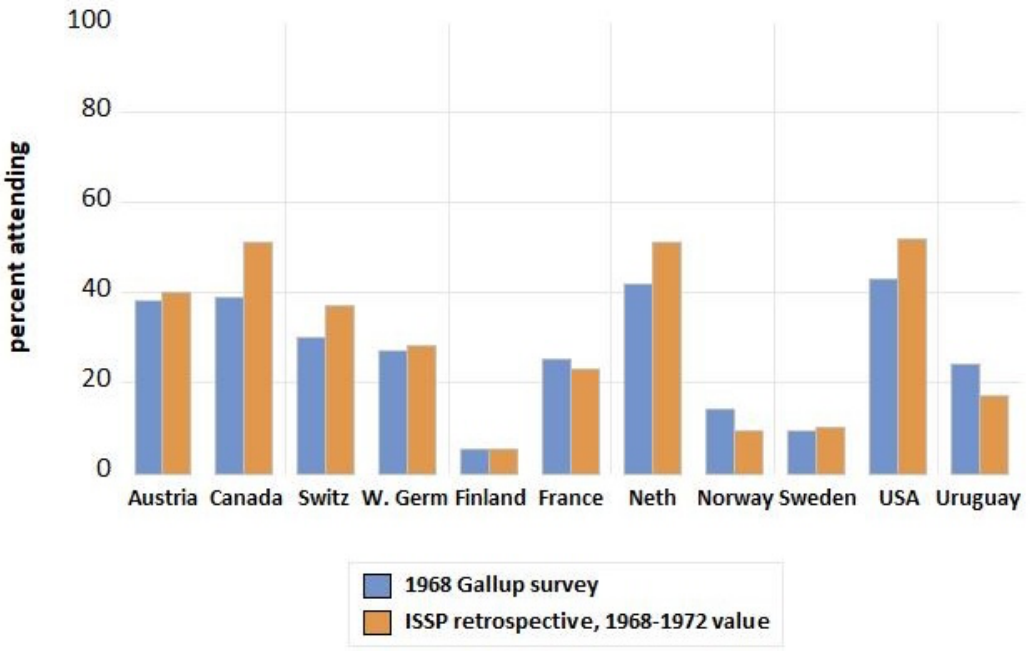
ISSP Retrospective vs. WVS Contemporaneous (1980-2010)



Note: The figures plot the relationship between the adult religious-service attendance rate from ISSP retrospective data against that from WVS contemporaneous data. A 45-degree line is shown for reference. The data are for monthly attendance (left graph) and weekly attendance (right graph). The contemporaneous data are for persons aged 30 to 60 with at least one child.

Figure 8

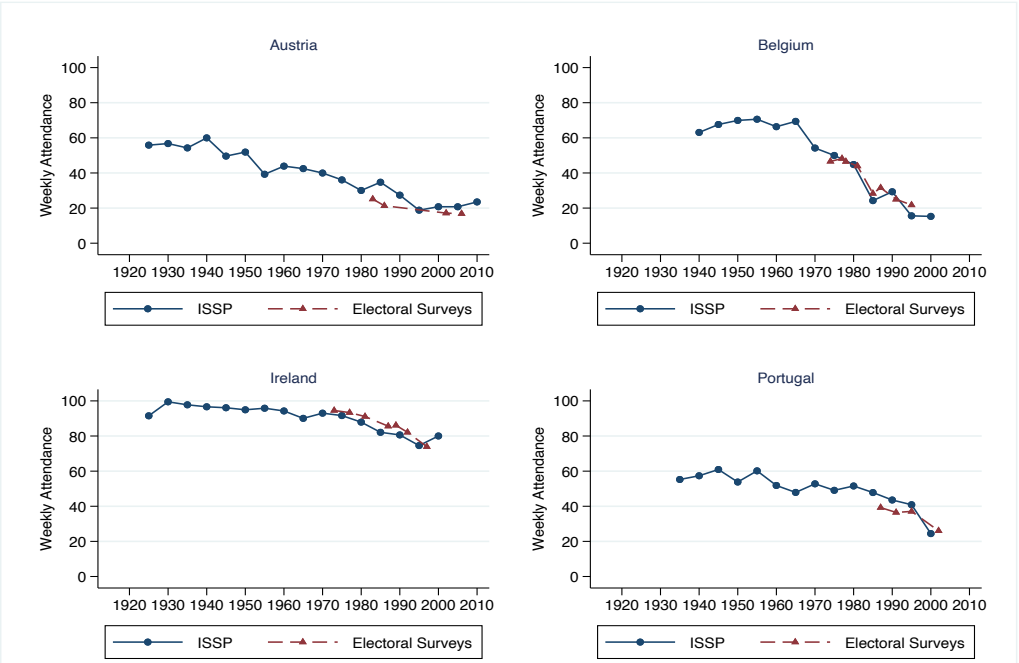
Comparison of ISSP Retrospective with Gallup 1968 Survey Data



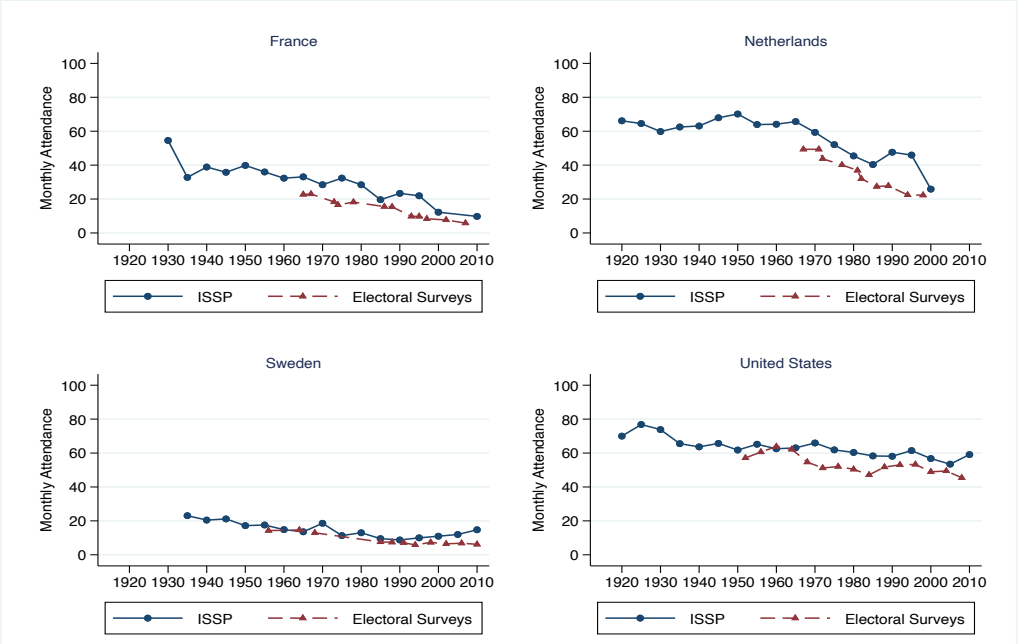
Note: The figure plots the rates of weekly religious-service attendance from the ISSP retrospective data for 1970 (1968-1972) and from the 1968 Gallup survey. The figure applies to the 11 countries with data in common.

Figure 9 Comparison between ISSP Retrospective and Electoral Surveys Data

Panel (*a*) Weekly Attendance



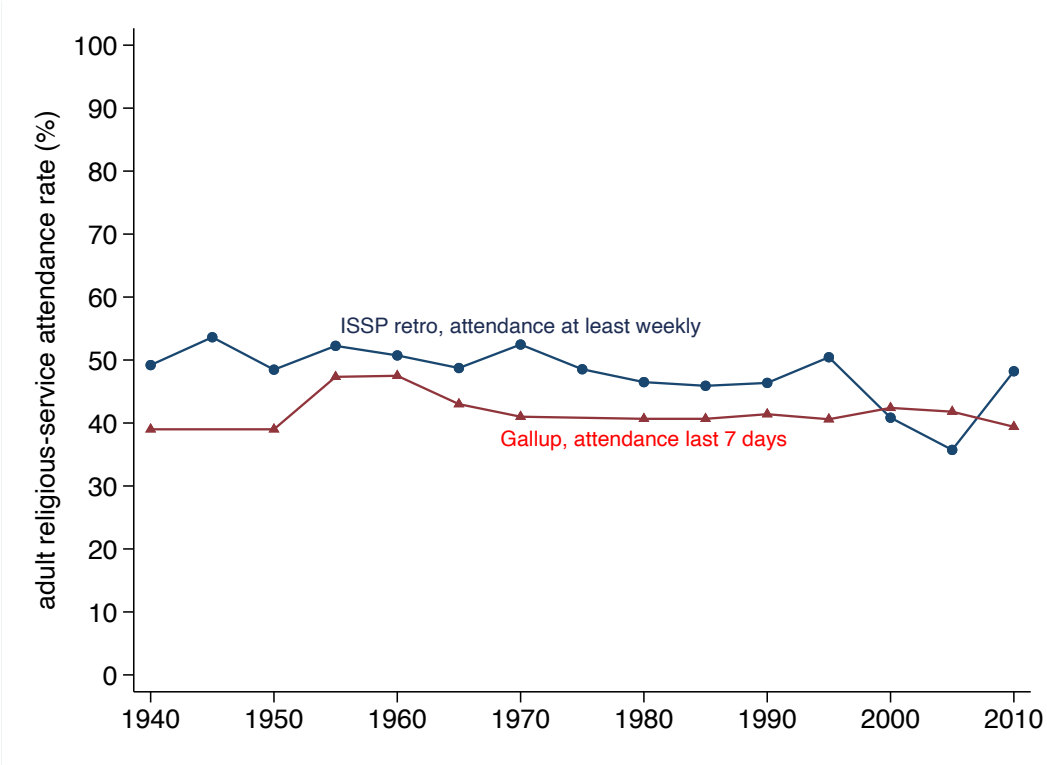
Panel (*b*) Monthly Attendance



Note: The figure plots time series of religious-service attendance rates from ISSP retrospective data (blue lines) and from contemporaneous data from post-election surveys from Gethin, et al. (2022) (red lines).

Figure 10

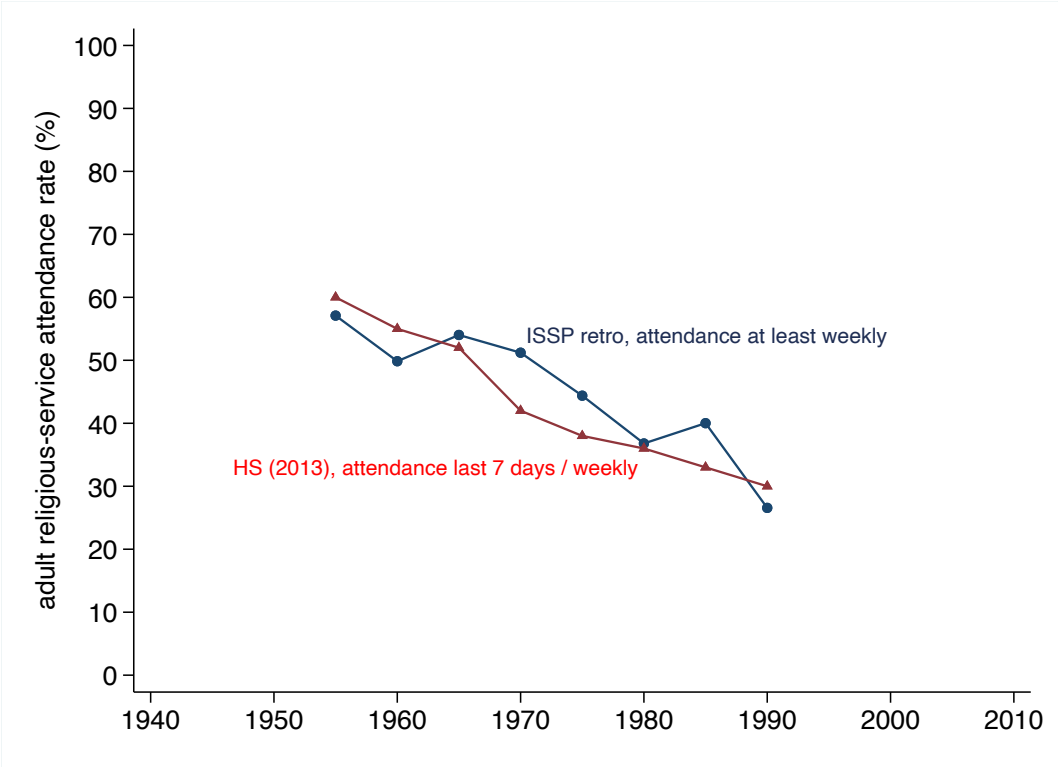
Comparison between ISSP Retrospective and Gallup Survey for the United States



Note: The figure plots time series of weekly adult religious-service attendance rates for the United States from ISSP retrospective data (blue line) and from contemporaneous data from Gallup (2024).

Figure 11

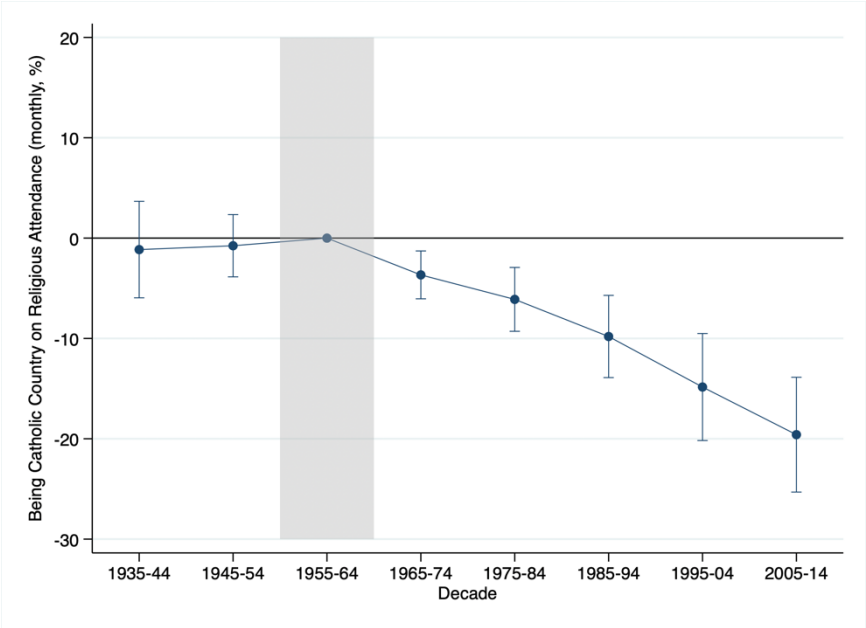
Comparison between ISSP Retrospective and Surveys for Canada



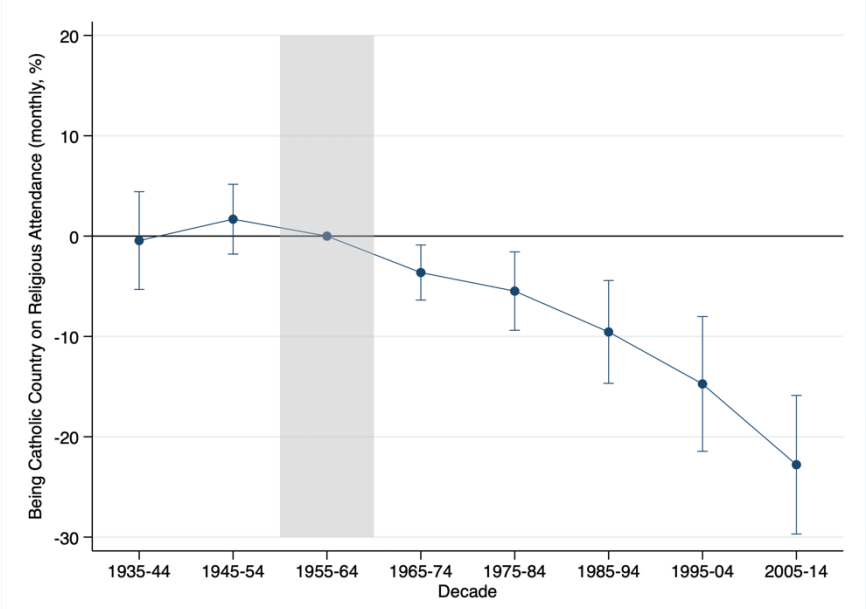
Note: The figures plots time series of weekly adult religious-service attendance rates from ISSP retrospective data (blue lines) and from contemporaneous data from Hiemstra and Stiller (2013, Figure 1, and updated data provided by these authors) (red lines).

Figure 12
Effects of Vatican II on Monthly Adult Religious-Service Attendance Rates

Panel (*a*) All countries



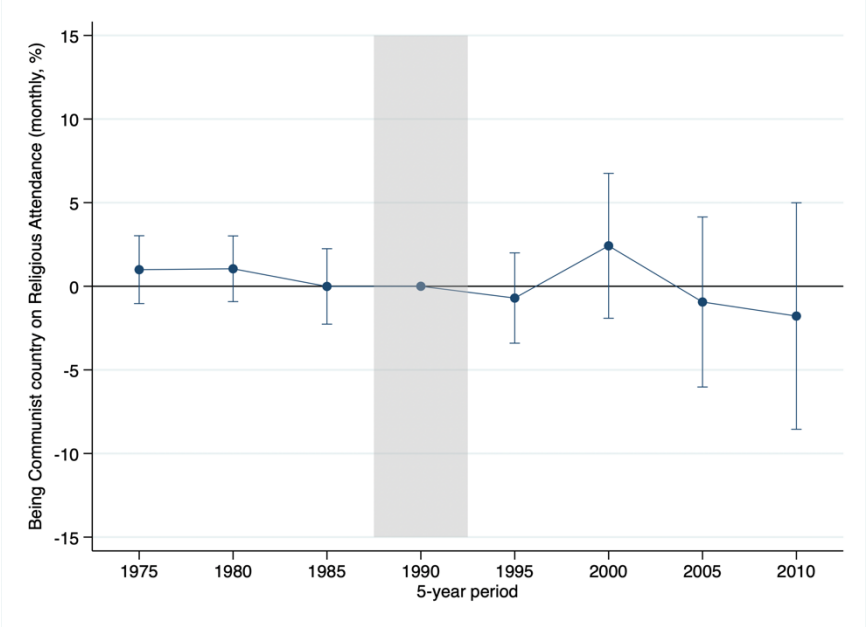
Panel (*b*) Christian countries



Note: The figure shows point estimates and 95% confidence intervals for coefficients of the leads and lags of the indicator variables defined in Eq. (1). The analysis applies to countries with Catholic adherence of 50% or more in 1900. Each indicator variable takes the value one in the indicated decade (with the coefficient set to zero for the 1955-1964 decade, denoted as period -1, when Vatican II took place). The estimated coefficients μ_{4-} and μ_{5+} in Eq. (1) are close to zero and are not shown in the figure. Estimation is by OLS. An observation is a country x decade, with 497 observations for 67 countries (with East and West Germany included separately) in Panel (a) and 322 observations for 41 countries in Panel (b). Standard errors are clustered at the country level. Control variables included are total population, average number of years of schooling, infant mortality rate, real GDP growth rate, and the presence of Communism. Appendix Table B4 shows the point estimates and other estimation output.

Figure 13
Effects of Ending Communism on Monthly Religious-Service Attendance Rates

Panel (*a*) Adults (parents)



Panel (*b*) Children

Note: The figures show point estimates and 95% confidence intervals for coefficients of the leads and lags of the indicator variables defined in Eq. (2). Each indicator variable takes the value one in the indicated five-year period (with the coefficient set to zero for the 1988-1992 period, denoted as period -1, when the ending of Communism occurred in the USSR and other former Communist countries). The estimated coefficients μ_{5-} and μ_{5+} in Eq. (2) are close to zero and are not shown in the figures. Estimation is by OLS. An observation is a country x five-year period, with 956 observations for 67 countries (with East and West Germany included separately). Standard errors are clustered at the country level. In Panel (*a*) the dependent variable is the monthly adult religious-service attendance rate; in Panel (*b*) it is the monthly child religious-service attendance rate. Appendix Table B5 shows the point estimates and other estimation output.

References

Ager, Phillip, Casper Worm Hansen, Ezra Karger, and Lars Lønstrup. 2024. "Religion as Social Insurance: Evidence from the Great Mississippi Flood of 1927," CEPR Discussion Paper 19565.

Anderson, Robert Warrant, Noel D. Johnson, and Mark Koyama. 2017. "Jewish Persecutions and Weather Shocks: 1100-1800," *Economic Journal*, 127, 924-958.

Azzi, Corry and Ronald Ehrenberg. 1975. "Household Allocation of Time and Church Attendance," *Journal of Political Economy*, 83, 27-56.

Barrett, David B. 1982. *World Christian Encyclopedia*, Oxford, Oxford University Press.

Barro, Robert J. and Rachel M. McCleary. 2003. "Religion and Economic Growth," American *Sociological Review*, 68, 760–781.

Barro, Robert J., Jason Hwang, and Rachel M. McCleary. 2010. "Religious Conversion in 40 Countries," *Journal for the Scientific Study of Religion*, 49, 15-36.

Barro, Robert J. and Jose Ursua. 2008. "Macroeconomic Crises since 1870," *Brookings Papers on Economic Activity*, Spring, 255-350.

Becker, Sascha O., Markus Nagler, and Ludger Woessmann. 2017. "Education and Religious Participation: City-Level Evidence from Germany's Secularization Period 1890–1930," *Journal of Economic Growth,* 22, 273–311.

Belloc, Marianna, Francesco Drago, and Roberto Galbiati. 2016. "Earthquakes, Religion, and Transition to Self-Government in Italian Cities," *Quarterly Journal of Economics*, 131, 1875-1926.

Bentzen, Jeanet. 2019. "Acts of God? Religiosity and Natural Disasters across Subnational World Districts," *Economic Journal*, 129, 2295–2321.

Berman, Eli, Laurence R. Iannaccone, and Giuseppe Ragusa. 2018. "From Empty Pews to Empty Cradles: Fertility Decline among European Catholics." *Journal of Demographic Economics*, 84, 149-187.

Bottan, Nicolas L. and Ricardo Perez-Truglia. 2015. "Losing My Religion: The Effects of Religious Scandals on Religious Participation and Charitable Giving," *Journal of Public Economics*, 129, 106-119.

Brenner, Philip S. 2011. "Exceptional Behavior or Exceptional Identity? Overreporting of Church Attendance in the US." *Public Opinion Quarterly* 75:19–41.

Brenner, Philip S. 2016. "Cross-National Trends in Religious Service Attendance," *Public Opinion Quarterly*, 80, 563-583.

Breskaya, Olga and Sinisa Zrinscak, eds. 2024. *Annual Review of the Sociology of Religion*, v.15*, Change and Its Discontents. Religious Organizations and Religious Life in Central and Eastern Europe*, Leiden Netherlands, Brill.

Bultena, Louis. 1949. “Church Membership and Church Attendance in Madison, Wisconsin,” American *Sociological Review*, 14, 384-389.

Chaney, Eric. 2013. “Revolt on the Nile: Economic Shocks, Religion, and Political Power,” *Econometrica*, 81, 2033-2053.

Chaves, Mark and David E. Cann. 1992. “Regulation, Pluralism, and Religious Market Structure,” *Rationality and Society*, 4, 272–290.

Chaves, M. and Philip S. Gorski. 2001. “Religious Pluralism and Religious Participation,” *Annual Review of Sociology*, 27, 261–281.

Chen, Daniel L.. 2010. “Club Good and Group Identity: Evidence from Islamic Resurgence during the Indonesian Financial Crisis,” *Journal of Political Economy*, 118, 300-354.

Davie, Grace. 1994. *Religion in Britain since 1945*, Oxford, Blackwell.

Evans, Geoffrey and Ksenia Northmore-Ball. 2012. “The Limits of Secularization? The Resurgence of Orthodoxy in Post-Soviet Russia,” *Journal for the Scientific Study of Religion*, 51, 795–808.

Finke, Roger and Rodney Stark. 1992. *The Churching of America*, 1776-1990: Winners and Losers in our Religious Economy, New Brunswick NJ, Rutgers University Press.

Franck, Raphaël and Laurence R. Iannaccone. 2014. “Religious Decline in the 20th Century West: Testing Alternative Explanations,” *Public Choice*, 159, 385–414.

Froese, Paul. 2004a. “After Atheism: An Analysis of Religious Monopolies in the Post-Communist World,” *Sociology of Religion*, 65, 57–75.

Froese, Paul. 2004b. “Forced Secularization in Soviet Russia: Why an Atheistic Model Failed,” *Journal for the Scientific Study of Religion*, 43, 35-50.

Froese, Paul. 2008. *The Plot to Kill God: Findings from the Soviet Experiment in Secularization*, Berkeley, University of California Press.

Froese, Paul and Steven Pfaff. 2001. “Replete and Desolate Markets; Poland, East Germany, and the New Religious Paradigm,” *Social Forces*, 80, 481-507.

Froese, Paul and Steven Pfaff. 2005. “Explaining a Religious Anomaly: A Historical Analysis of Secularization in Eastern Germany,” *Journal for the Scientific Study of Religion*, 44, 397-422.

Gallup. 2024. “How Religious Are Americans?” available at news.gallup.com/poll/358364/religious-americans.aspx#, March 29. See also news.gallup.com/poll/1690/religion.aspx.

Gethin, Amory, Clara Martinez-Toledano, and Thomas Piketty. 2022. "Brahmin Left versus Merchant Right: Changing Political Cleavages in 21 Western Democracies, 1948-2020,” *Quarterly Journal of Economics*, 137, 1–48.

Gihleb, Rania and Osea Giuntella. 2017. "Nuns and the effects of catholic schools. Evidence from Vatican II," *Journal of Economic Behavior & Organization*, *137*, 191–213.

Glaeser, Edward L. and Bruce I. Sacerdote. 2008. “Education and Religion,” *Journal of Human Capital*, 2, 188-215.

Glenn, Norval D. 1987. “The Trend in “No Religion’ Respondents to U.S. National Surveys,” Late 1950s to Early 1980s,” *Public Opinion Quarterly*, 51, 293-314.

Glock, Charles Y. and Rodney Stark. 1965. *Religion and Society in Tension*, Chicago, Rand McNally.

Greeley, Andrew M. 2002. "Religious Revivals in Eastern Europe," *Society*, 39, 76-77.

Greeley, Andrew M. 2004. *The Catholic Revolution: New Wine*, Old Wineskins, and the Second Vatican Council, Berkeley CA, University of California Press.

Gruber, J., & Hungerman, D. M. 2008. The Church vs. the Mall: What happens when religion faces increased secular competition. *Quarterly Journal of Economics*, 123, 831–862.

Hiemstra, Rick and Karen Stiller. 2016. *Religious Affiliation and Attendance in Canada*, Trust Center for Theological Schools, available at intrust.org/in-trust-magazine-issues/new-year-2016/religious-affiliation-and-attendance-in-canada.

Hout, Michael, and Andrew M. Greeley. 1987. “The Center Doesn’t Hold: Church Attendance in the United States, 1940-1984,” American *Sociological Review*, 52, 325-345.

Iannaccone, Laurence R. 1991. “The Consequences of Religious Market Structures: Adam Smith and the Economics of Religion,” *Rationality and Society*, 3, 156–177.

Iannaccone, Laurence R. 1992. “Sacrifice and Stigma: Reducing Free-Riding in Cults, Communes, and other Collectives,” *Journal of Political Economy*, 100, 271-291.

Iannaccone, Laurence R. 2003. “Looking Backward: A Cross-National Study of Religious Trends,” unpublished, George Mason University.

Iannaccone, Laurence R. and Rodney Stark. 1994. “A Supply -Side Reinterpretation of the ‘Secularization’ of Europe,” *Journal for the Scientific Study of Religion*, 33, 230-252.

Kahneman, Daniel, Paul Slovic, and Amos Tversky. 1982. Judgment Under Uncertainty: Heuristics and Biases. Cambridge, Cambridge University Press.

Kornai, Janos. 1992. *The Socialist System: The Political Economy of Communism*, Princeton NJ, Princeton University Press.

Jenkins, Philip 2002. *The Next Christendom: The Coming of Global Christianity*. Oxford: Oxford University Press.

Lazerwitz, Bernard. 1961. “Some Factors Associated with Variations in Church Attendance,” *Social Forces*, 39, 301-309.

Lipset, Seymour M. 1991. *“American Exceptionalism Reaffirmed*.” In Is America Different? A New Look at American Exceptionalism, ed. B. Shafer, New York: Oxford University Press. 1–45.

Lenski, Gerhard E. 1953. “Social Correlates of Religious Interest,” *American Sociological Review*, 18, 533-544.

Lyall, Jason. 2020. *Replication Data for Divided Armies*, available at doi.org/10.7910/DVN/DUO71E.

MacCulloch, Diarmaid. 2010. *A History of Christianity the First Three Thousand Years*. London, Penguin.

Madsen, Richard. 2013. “Religion under Communism,” Oxford Handbook of the History of Communism, Stephen A. Smith, ed., Oxford, Oxford University Press.

McCleary, Rachel M. and Robert J. Barro. 2006. “Religion and Political Economy in an International Panel,” *Journal for the Scientific Study of Religion*, 45, 149-175.

Miller, Charles. 2022. *Historical Conflict Event Dataset*, available at https://doi.org/10.7910/DVN/6ZFC0V,

Norris, Pippa, and Ronald Inglehart. 2011. *Sacred and Secular: Religion and Politics Worldwide*, 2nd ed. New York: Cambridge.

Northmore-Ball, Ksenia and Geoffrey Evans. 2016. Secularization versus Religious Revival in Eastern Europe: Church Institutional Resilience, State Repression and Divergent Paths. *Social Science Research*, 57, 31–48.

O’Malley, John W. 2010. *What Happened at Vatican II*, Cambridge MA, Harvard University Press.

Ruiter, Stijn and Frank Van Tubergen. 2009. “Religious Attendance in Cross-National Perspective: A Multilevel Analysis of 60 Countries”, *American Journal of Sociology*, 115 (3), 863-895.

Sigelman, Lee. 1977. “Multi-Nation Surveys of Religious Beliefs,” *Journal for the Scientific Study of Religion*, 16, 289-294.

Smith, Tom W. and Benjami Schapiro. 2021. “The International Social Survey Program Modules on Religion, 1991–2018, “*International Journal of Sociology*, 51, 337-344.

Stark, Rodney. 1999. "Secularization, R.I.P.," *Sociology of Religion*, *60*, 249–273.

Stolz, Jorg, Oliver Lipps, David Voas, and Jean-Philippe Antonietti. 2024. "Can We Explain the Generation Gap in Churchgoing?" *Journal for the Scientific Study of Religion*, 63, 809–829.

Tomka, Miklos. 2011. *Expanding Religion: Religious Revival in Post-Communist Central and Eastern Europe*, Hague, De Gruyter.

Voas, David, and Mark Chaves. 2016. “Is the United States a Counterexample to the Secularization Thesis?” *American Journal of Sociology* 121 (5):1517–56.

Wilde, Melissa J. 2004. “How Culture Mattered at Vatican II: Collegiality Trumps Authority in the Council’s Social Movement Organizations,” American *Sociological Review*, 69, 576-602.

Wilde, Melissa J. 2007. *Vatican II: A Sociological Analysis of Religious Change*, Princeton NJ, Princeton University Press.

Appendix

The first part of the appendix covers Bayesian estimation of a model with measurement error. The second part has appendix tables, and the third part has appendix figures.

A. Comparisons with Bayesian Estimation of Attendance using Hierarchical Modeling

Our attendance series are well suited for Bayesian shrinkage approaches; they are combinations of the same latent historical attendance rates evaluated by different groups, which may differ in their recall biases. Older respondents, for instance, might have a harder time remembering events of their childhood or have a tendency to over or underreport. The gender of a respondent could also matter for their experience and recall of the same parental behavior, possibly depending on the gender-match between the parent and the child. A hierarchical model accounts for these systematic differences between groups while sharing information across them. In addition, the resulting shrinkage—that is, the pulling of estimates toward their group-specific means when uncertainty is large—helps to reduce the noise associated with the small sample sizes of some groups.

Concretely, we model $y^{j}_{\{it\}}$, the recalled monthly church attendance rate of parent of gender *j* at time *t* by child *i* in country *c* as

$$y^{j}_{it} = \theta^{j}_{c,t} + \beta^{j}_{i,t} + \alpha^{j}_{n} + \varepsilon^{j}_{i,t} \tag{A1}$$

with

$$\beta^{j}_{i,t} = \gamma^{\mathrm{j}}_{\mathrm{a}} + \delta^{\mathrm{j}}_{\mathrm{it}}$$

where $\theta_{c,t}$ is the true adult attendance rate in the country, $\beta^{j}_{i,t}$ are 10-year age cohort deviations modeled as random effects, α^{j}_{n} is a child-gender "n" specific recall deviation modeled as a fixed effect, and $\varepsilon^{j}_{i,t}$ is idiosyncratic noise. We estimated this model separately for father and mother attendance, with a

Bayesian logistic regression, setting the priors of all parameters to be distributed $\mathcal{N}(0, \sigma)$.[23] We use ISSP individual level data of each county-decade with more than 20 respondents, as we did when computing means of the raw data. Appendix Figure C5 shows the comparison of these Bayesian estimates for mother attendance with the mean values computed from the raw data. Overall, the two series follow each other closely in all countries. This correspondence also holds for father attendance.

As expected, the imprecision of the estimates, shown as 95% confidence intervals, is larger for earlier years, and, perhaps more surprisingly, also for recent periods. These results likely apply because the number of the different age cohorts and the reliability of their recall are smaller for these years. Appendix Figure C6 plots the estimated γ_a^j, i.e., the age-cohort estimated deviations. Not only do older/younger cohorts tend to slightly over/under-estimate attendance compared to 30- or 40-year-old adults (by 2 to 3 percentage points), they also have a wider range of deviation (up to 18 percentage points for the 90-year-old cohort, as opposed to 8 percentage points for the 40-year-old one). In other words, their recall seems less precise, though reliable on average.

Appendix Figure C7 looks at gender-specific deviations in mother and father attendance, the α_n^j. Gender being a (quasi-)random outcome, it should, a priori, not impact the probability of parents attending religious services monthly.[24] The figure provides an interesting insight: when compared to female respondents, males seem to over-estimate their father's attendance but not their mother's. The effect is not large (around one percentage point) but clearly distinguishable from zero. This pattern could be consistent with the salience heuristics described above, if one believes that, during the 20th century, the behavior of a parent was more salient to a child of the same gender.

[23]We use the brms package with *cmdstanr* backend (using MCMC sampling), setting 4 chains of 4000 iterations each. Convergence was easily achieved, with the R-hat (the ratio of between- and within- chain variances) of the father and mother attendance models both at 1.001, and Bulk/Tail effective sample sizes (that is, the number of independent samples of the chain, accounting for the autocorrelation between them) of 4938/5531 and 1722/2967, respectively.

[24]Unless one conjectures that raising a child of a certain gender can impact religious attitudes of parents.

Overall, the results of this fairly unconstrained Bayesian estimation echo our previous validation exercises. They indicate that some of the suspected biases of retrospective data could exist, but their magnitude is small and the data reliable in producing time trends

B. Appendix Tables

Table B1

Questions on Religious-Service Attendance in Electoral Surveys collected by Gethin, et al. (2022)

Survey	Religious-Service Attendance Question	Country (years)	Notes
American National Election Studies (ANES)	1970-1988: Would you say you/do you go to (church / synagogue) (1) every week (2) almost every week (3) once or twice a month (4) a few times a year (5) or never? 1990 and later: Lots of things come up that keep people from attending religious services even if they want to. Thinking about your life these days, do you ever attend religious services, apart from occasional weddings, baptisms or funerals? (if yes) Do you go to religious services (1) every week (2) almost every week (3) once or twice a month (4) a few times a year, (5) or never?	United States (1972-2008)	
Dutch Parliamentary Election Studies	How often do you attend religious meetings or church services? (1) At least once a week (2) 2 or 3 times a month (3) Once a month (4) Several times a year (5) (Almost) Never	Netherlands (1971-1997)	
Eurobarometer	Do you go to religious service (1) Several times a week (2) Once a week (3) A few times a year (4) or never?	Austria (1994-2002); Belgium (1974-1997); Ireland (1973-1997); Portugal (1985-2002)	No “monthly” category

European Social Survey (ESS)	Apart from special occasions such as weddings and funerals, about how often do you attend religious services nowadays? (1) Every day (2) More than once a week (3) Once a week (4) At least once a month (5) Only on special holy days (6) Less often (7) Never	Austria (2007)	
French Election Studies	Usually, do you go to the mass: (1) Several times a week (2) Every Sunday (3) Once or twice a month (4) From time to time (5) Only on special occasions (6) Never	France (1967-2007)	"Every Sunday" could be different than "Every week"
International stratification, mobility and politics file (ISMP)	How often do you attend religious services? (1) Always (every week) (2) Mostly (1 times a month) (3) Sometimes (few times a year) (4) Seldom (5) Never	Austria (1971-1991);	
Swedish National Election Studies	How often do you attend Church of Sweden or free church services of meetings? (1) At least once a month (2) A few times a year (3) Less often (4) Never	Sweden (1956-2010)	No "weekly" category

Note: The table lists the questions on religious-service attendance from country-specific or cross-country post-election surveys collected by Gethin, et al. (2022). The years in parentheses indicate the years that overlap with the ISSP retrospective attendance data.

Table B2

Comparing Observations in Common in ISSP Survey Years for Each Retrospective Year, Adult Monthly Attendance

Retro Year	N	1991	1998	N	1991	2008	N	1991	2018	N	1998	2008	N	1998	2018	N	2008	2018
1925	1	64.0	72.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1930	9	64.3	65.1	--	--	--	--	--	--	--	--	--	--	--	--	--		--
1935	16	60.8	57.1	8	62.8	55.2	--	--	--	8	62.8	55.2	--T	--	--	--	--	--
1940	18	60.4	55.9	14	61.3	63.2	1	37.0	31.0	14	61.3	63.2	1	31.0	49.0	1	31.0	49.0
1945	18	60	59.5	16	59.2	58.2	5	53.6	55.0	16	59.2	58.2	11	50.8	48.5	10	53.3	48.5
1950	18	57.3	59.2	17	55.8	56	8	47.6	52.2	17	55.8	57.6	18	46.2	47.6	17	46.5	48.3
1955	18	54.1	56.9	17	53.2	56.4	10	46.0	50.1	17	53.2	56.1	21	43.6	42.7	20	44.4	43.6
1960	18	52.6	53.4	17	52.1	55.8	11	48.4	50.1	17	52.1	52.2	22	41.2	42.4	21	42.5	43.5
1965	18	52.9	52.6	17	51.5	53.9	11	48.5	49.1	17	51.5	51.1	22	40.2	41.4	21	41.4	42.6
1970	18	49.3	52.9	17	48.2	51.2	11	44.2	48.5	17	48.2	51.5	22	39.2	39.6	21	40.5	41.0
1975	18	47.1	50.6	17	45.8	50.4	11	42	46.5	17	45.8	44.2	22	36.6	37.6	21	38.1	39.0
1980	18	47.2	46.9	17	46	46.4	11	42.6	41	17	46.0	45.9	22	35.9	34.7	21	36.9	35.4
1985	15	50.3	45.9	13	51.8	47.5	9	45.9	42.4	13	51.8	47.5	22	31.2	34.6	21	32.2	35.5
1990	--	--	--	--	--	--	--	--	--	--	--	--	22	32.3	33	21	33.3	34.2
1995	--	--	--	--	--	--	--	--	--	--	--	--	3	15	13	3	15.0	13.0

Note: For each retrospective year, the columns show the number, *N*, of observations in common and the mean adult monthly religious-service attendance rates for each pair of survey years.

Table B3

Effects of Vatican II: Main Religion of Countries in the Sample

Catholic	Other Christian	Other/No Religion
Austria	Australia	Algeria
Belgium	Bulgaria	Cambodia
Brazil	Canada	Ghana
Chile	Cyprus	Indonesia
Croatia	Denmark	Israel
Czech Republic	Estonia	Japan
Dominican Republic	Finland	Jordan
France	Georgia	Kenya
Hungary	Germany East	Latvia
Ireland	Germany West	Malawi
Italy	Iceland	Malaysia
Lithuania	Netherlands	Mongolia
Mexico	New Zealand	Nepal
Nicaragua	Norway	Nigeria
Philippines	Russia	Singapore
Poland	Sweden	South Africa
Portugal	Switzerland	South Korea
Slovakia	Ukraine	Sri Lanka
Slovenia	United Kingdom	Suriname
Spain		Taiwan
Uruguay		Tanzania
Venezuela		Thailand
		Tunisia
		Turkey
		United States
		Vietnam

Note: The table shows the countries with 50% or more of the population in 1900 adhering to Catholicism, other Christian Denominations, or other (that is, either another religion or no religion constitutes the majority). The underlying data are from the *World Christian Database*.

Table B4

Effects of Vatican II on Monthly Adult Religious-Service Attendance Rates: Table format

	All Countries	Christian Countries
	(1)	(2)
Decade -3	-1.14	-0.45
	(2.88)	(2.89)
Decade -2	-0.76	1.68
	(1.86)	(2.06)
Decade 0	-3.67**	-3.63**
	(1.43)	(1.63)
Decade 1	-6.11***	-5.48**
	(1.91)	(2.32)
Decade 2	-9.81***	-9.55***
	(2.46)	(3.04)
Decade 3	-14.84***	-14.73***
	(3.20)	(3.99)
Decade 4	-19.59***	-22.78***
	(3.43)	(4.10)
Country FE	✓	✓
Decade FE	✓	✓
Controls	✓	✓
R-sq (within)	0.28	0.35
Observations	497	322
Clusters	67	41
Mean DepVar	46.6	45.2

Note: Models are estimated using OLS. An observation is a country x decade. The sample includes all countries with religious attendance data in Column (1), and all countries with either Protestant, Orthodox, or Catholic pre-dominance in 1900 in Column (2). The dependent variable is the monthly religious attendance in percent. Controls and 4-/5+ indicator variables are not included for the sake of clarity. Standard errors are shown in parentheses and clustered at the country level.
*p<0.10, **p<0.05, ***p<0.01.

Table B5

Effects of Ending Communism on Religious-Service Attendance Rates: Table format

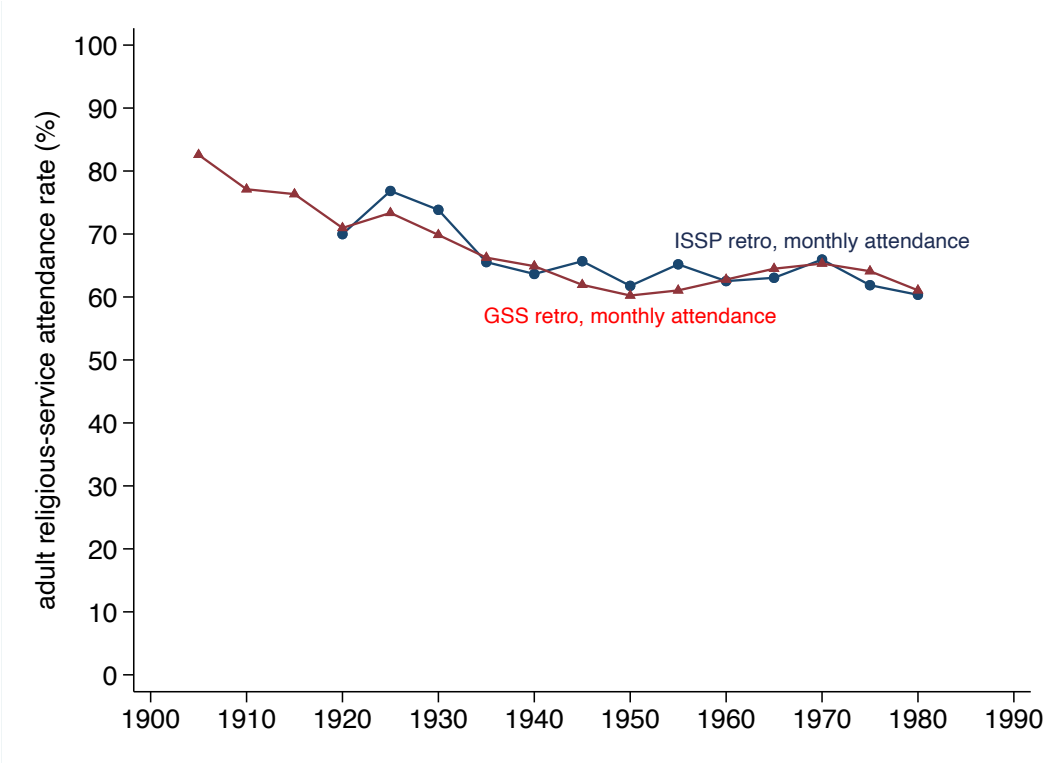
	Adult Monthly Attendance	Child Monthly Attendance
	(1)	(2)
Period -4	0.99	-0.39
	(1.22)	(1.13)
Period -3	1.05	0.44
	(1.18)	(1.14)
Period -2	-0.01	-1.46
	(1.35)	(1.55)
Period 0	-0.70	3.82
	(1.62)	(2.31)
Period 1	2.42	6.95*
	(2.60)	(3.74)
Period 2	-0.94	4.44
	(3.05)	(5.04)
Period 3	-1.78	1.92
	(4.06)	(5.75)
Country FE	✓	✓
Decade FE	✓	✓
Controls	✓	✓
R-sq (within)	0.17	0.15
Observations	956	956
Clusters	67	67
Mean DepVar	46.6	51.6

Note: Models are estimated using OLS. An observation is a country x 5-year period. The dependent variable in column 1 is the adult monthly religious-attendance rate. In column 2 it is the child monthly religious-attendance rate. Controls and 5-/4+ indicator variables are not shown. Standard errors are in parentheses and clustered at the country level.
* p<0.10, ** p<0.05, *** p<0.01.

C. Appendix Figures

Figure C1

U.S. Monthly Adult Religious-Service Attendance Rate: Comparing Retrospective Data for Parents from ISSP and GSS (prior to the integration of the latter into the former).

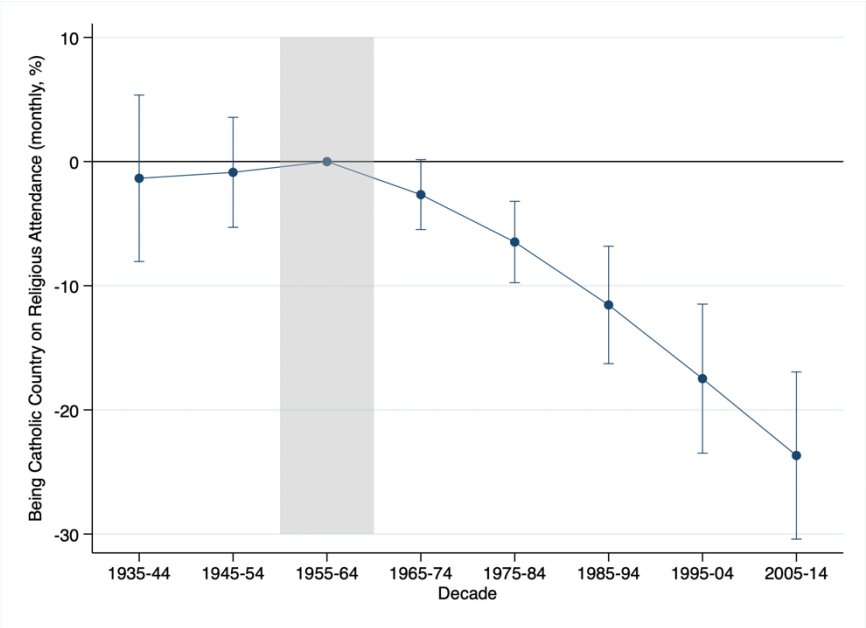


Note: The figure plots the rates of religious-service attendance from ISSP retrospective data of the 1991, 1998, 2008 and 2018 waves (blue line) and GSS retrospective data of the 1983, 1984, 1985, 1986, and 1988 waves (red line).

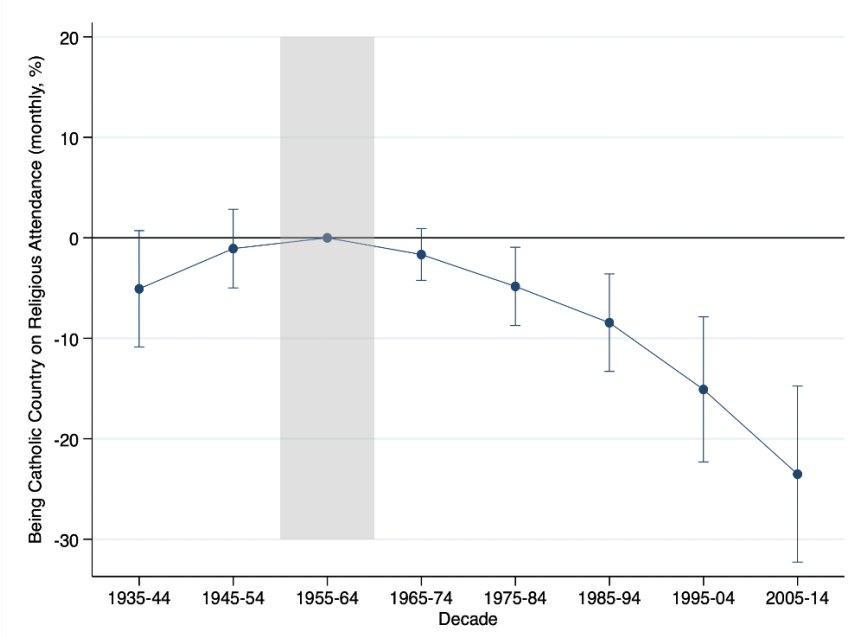
Figure C2

Effects of Vatican II on Monthly Religious-Service Attendance Rates: Robustness

Panel (a) Using Share of Catholic Adherents



Panel (b) Using Monthly Child Attendance Rates

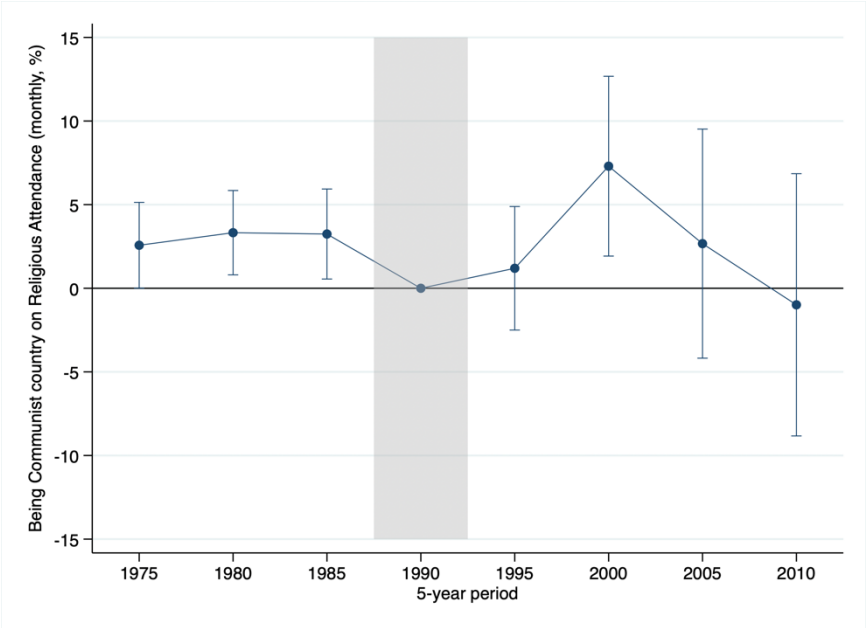


Note: See the notes to Figure 12. Panel (a) uses the share of Catholic adherents in 1900 instead of an indicator variable for whether the Catholic adherence share is 50% or more. Panel (b) uses monthly religious-service attendance rates for children.

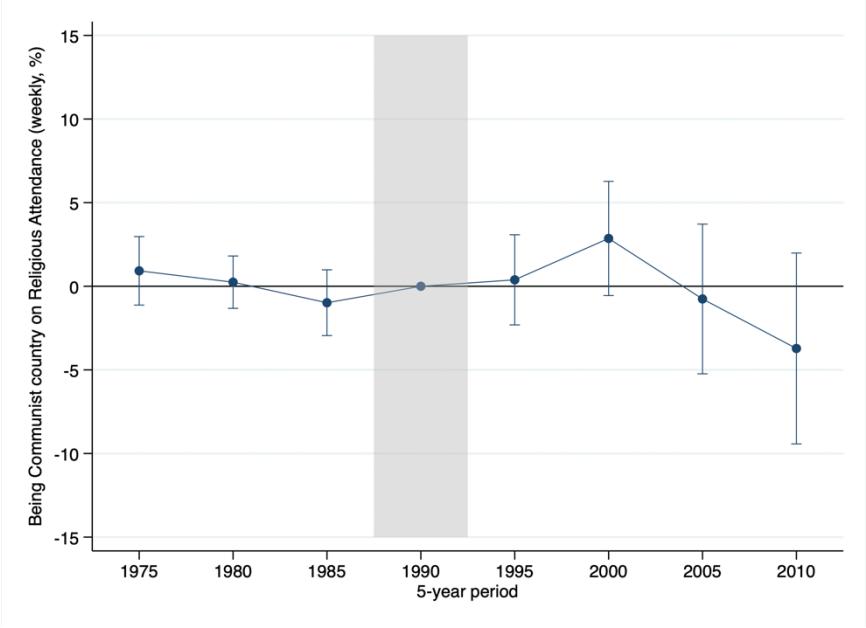
Figure C3

Effects of Ending Communism on Attendance Rates: Robustness

Panel (a) European Countries only



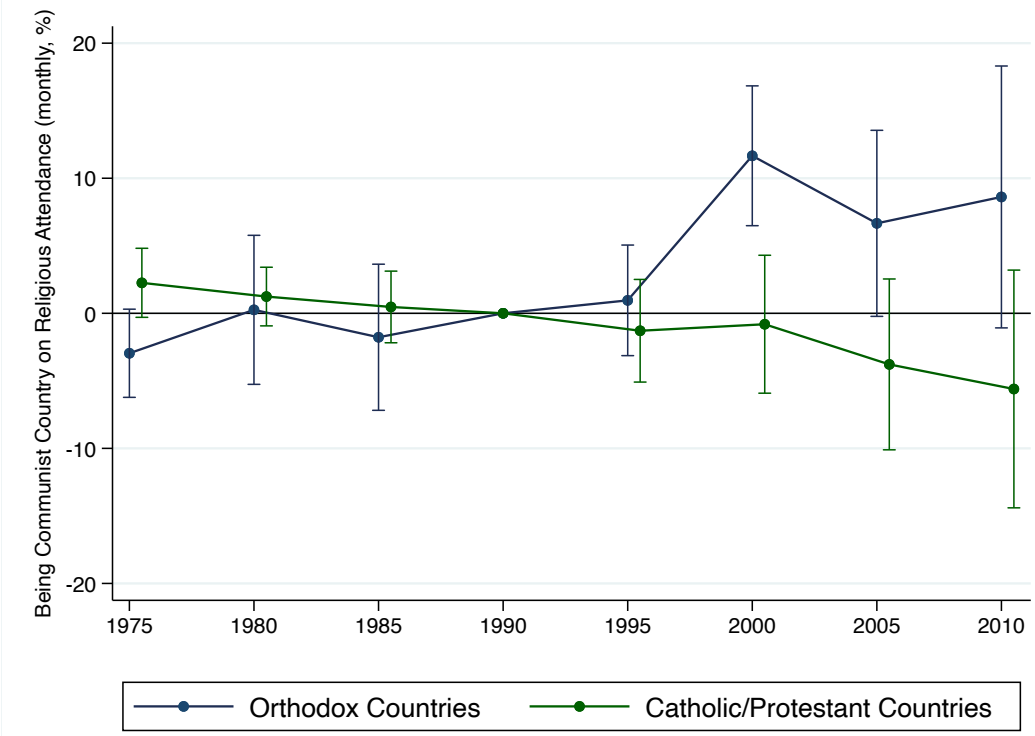
Panel (b) Weekly Attendance



Note: See the notes to Figure 13. In Panel (a), the sample is 32 countries in Europe. In Panel (b), the outcome variable is weekly attendance.

Figure C4

Effects of Ending Communism on Monthly Adult Religious-Service Attendance Rates: Orthodox vs. Catholic and Protestant countries.

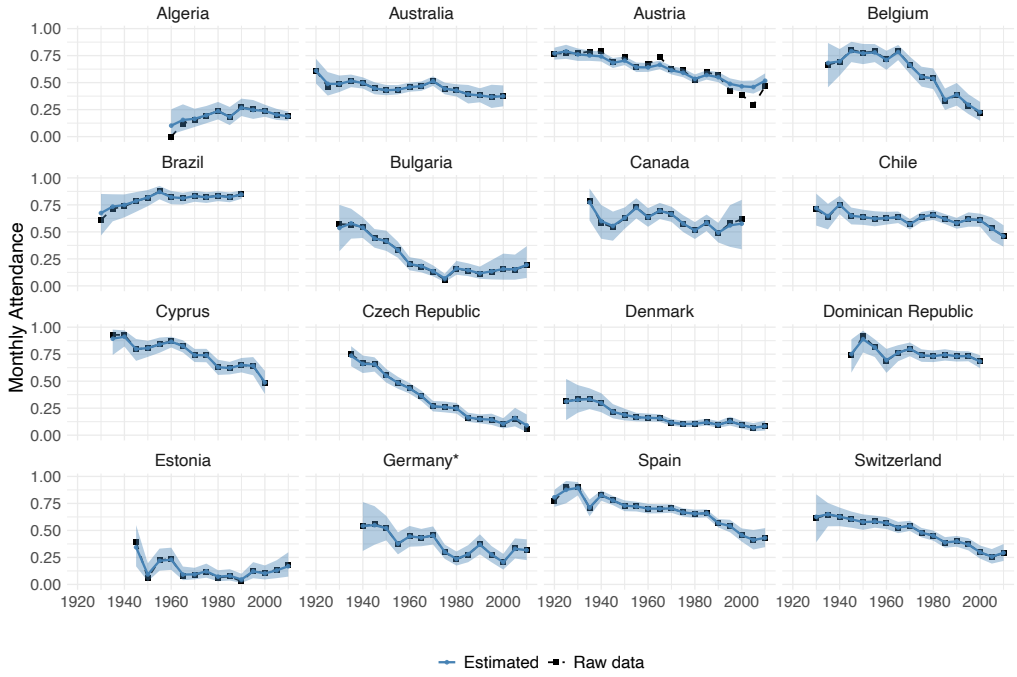


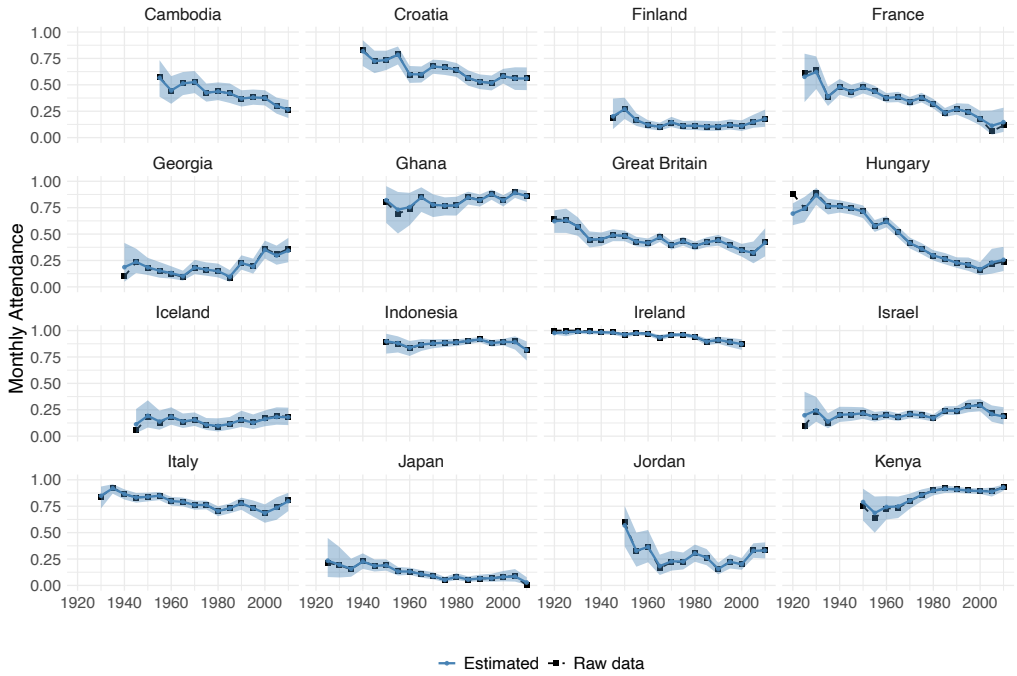
Note: This figure modifies Figure 13 to separate Orthodox from Catholic/Protestant countries. See the notes to Figure 13.

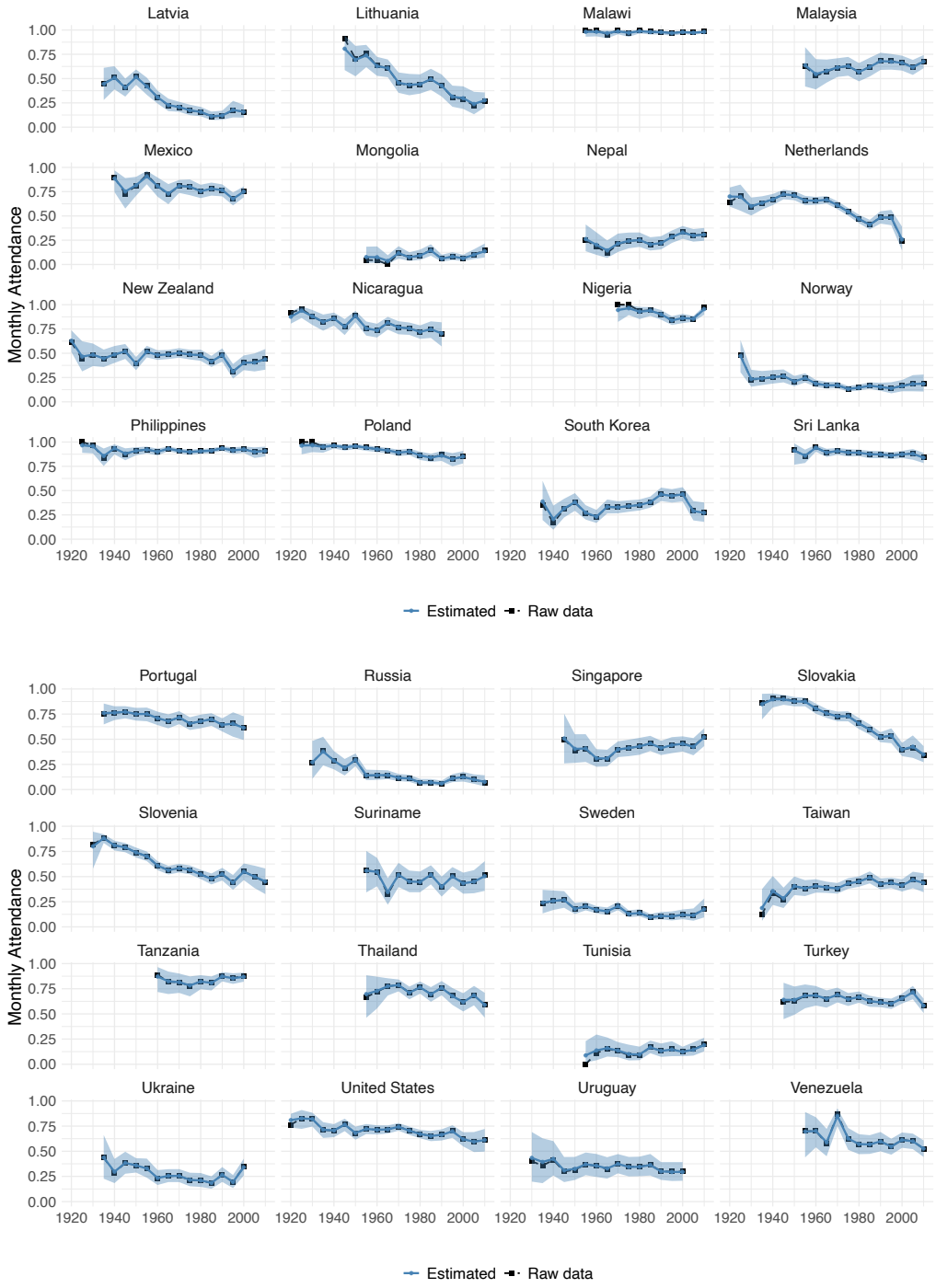
Figure C5

Comparisons between Sample Averages and Bayesian Estimates of Mothers' Religious-Service Attendance Rate

ISSP retrospective data



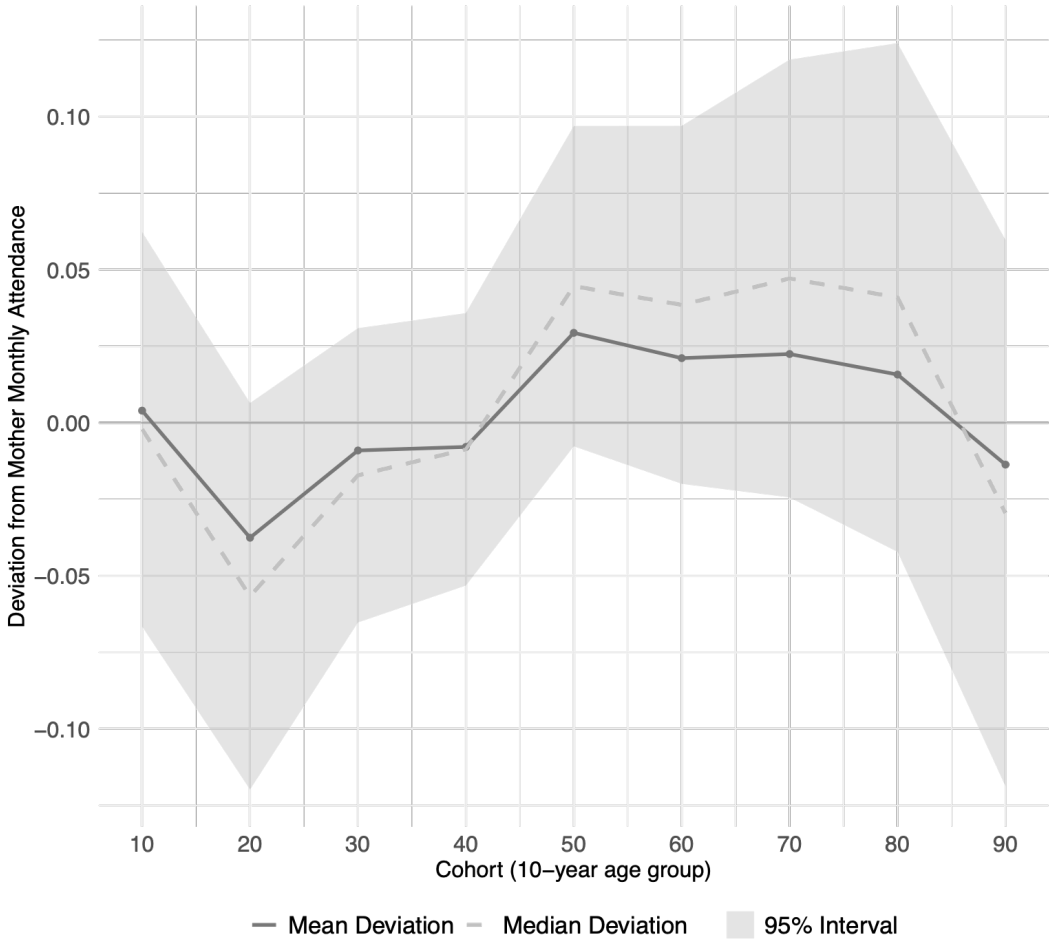




Note: The figure plots time series of religious-service attendance rates of adult females (mothers) from ISSP retrospective data, obtained as sample averages of the individual observations (black dashed lines) and as the point estimates and 95% confidence intervals resulting from a Bayesian estimation of a hierarchical model described in Appendix A (blue lines and areas).

Figure C6

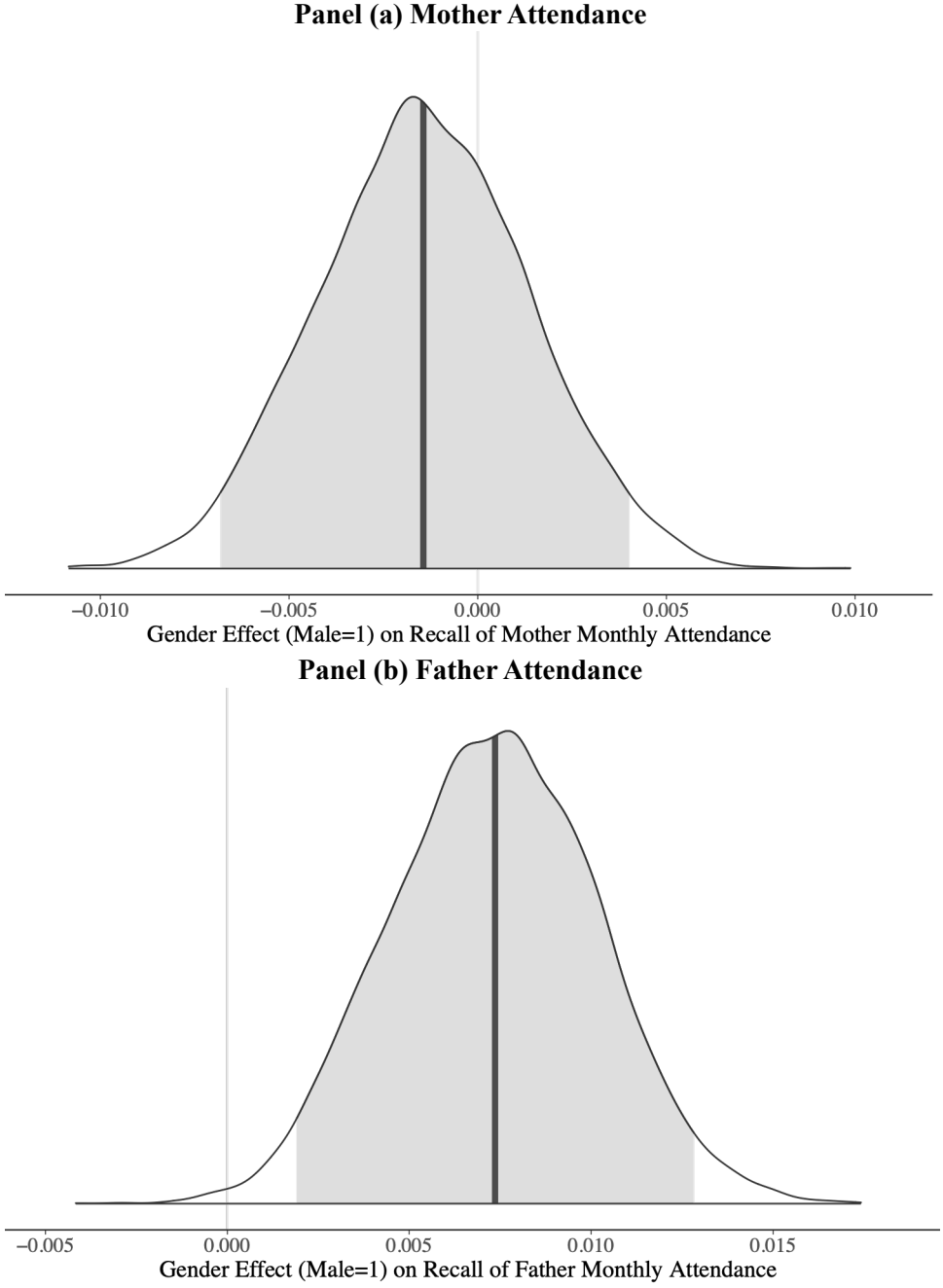
Cohort-deviations in Individual Recall of Mothers' Religious-Service Attendance Rates



Notes: The figure plots, for each 10-year age cohort, the distribution of deviations in recall of mothers' religious-service attendance rate, as defined in Eq. (A1) and estimated with a Bayesian approach.

Figure C7

Effect of Child's Gender on the Recall of Parental Attendance, Bayesian Estimates



Note: The figures show the distribution of the effect of the ISSP respondent's gender on the probability of recalling the monthly religious-service attendance rate of one's mother (Panel *a*) or father (Panel *b*).