

# Can Schools Change Religious Attitudes? Evidence from German State Reforms of Compulsory Religious Education

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The question whether churches should have a place in public schools to teach religious education has been the subject of fierce disputes in many countries throughout history. Yet little is known about whether compulsory religious education in fact affects people's religiosity in the long run. We argue that the different timing of reforms that abandoned compulsory religious education across German states provides plausibly exogenous variation in individuals' exposure to compulsory religious education. Our event-study approach shows that, conditional on state and birth-year fixed effects, the termination of compulsory religious education led to a significant reduction in reported religiosity, personal prayer, and church membership of affected students in adulthood. Beyond religious attitudes, the reform also affected family and economic outcomes: It reduced males' conservative attitudes towards gender roles and marriage and the number of children and increased female labor-force participation and earnings. Supporting our identifying assumption, the reform is not related to a series of placebo outcomes or to non-religious school outcomes.

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## Extended Abstract

Religious attitudes are an important component of people's personalities and values. On average across the 60 countries participating in the World Values Survey in 2000-2014, 82 percent of the population belong to a religious denomination, 71 percent say that religion is important in their life, and 57 report to pray at least several times a week. People's religiosity has important repercussions for their personal preferences, interpersonal interactions, and economic prosperity (Iannaccone (1998); McCleary and Barro (2006a); Iyer (2016)). Still, as religious attitudes are often deeply ingrained in humans' personality, rigorous research on their emergence and determinants faces a challenging task. In particular, are religious attitudes natural traits of a person or can they be taught? In this paper, we address the question whether the school curriculum can affect individuals' religious attitudes in adulthood.

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The relationship between religion and the state in the education system has been a contested matter throughout history. Many Western school systems have their roots with the churches, which then exerted fierce resistance to the emerging state-sponsored non-denominational education systems during the 19<sup>th</sup> century (Ramirez and Boli (1987); West and Woessmann (2010)). Democracies and dictatorships alike use state schooling as a means of indoctrination, socialization, and instruction of beliefs (Lott (1999); Gradstein and Justman (2002); Pritchett and Viarengo (2015)). This has left wide variation across countries in the extent to which churches can instill religious attitudes through religious instruction in the public school system. Some countries like the United States have enacted a strict separation of church and state that forbids religious education in public schools. Other countries allow for religious education as an elective subject or even have it as a compulsory subject in public schools.

Against the backdrop of Nazi takeover of schools, the 1949 constitution of the Federal Republic of Germany formally enshrined religious education as the only subject that is institutionalized as a regular subject in public schools. Initially, nearly all German states had religious education as a compulsory subject in their curricula. At different points in time since the early 1970s, however, different states have replaced the obligation to attend religious education with the option to choose between denominational religious education and ethics as a non-denominational subject. We argue and provide supporting evidence that conditional on state and birth-year fixed effects, this series of reforms provides plausibly exogenous variation in individuals' exposure to compulsory religious education.

We use the variation in the abolishment of compulsory religious education across West German states and over time to analyze whether schools can affect religious outcomes in adulthood. The first state, Bavaria, abolished compulsory education in 1972, and the last states, Hamburg and North Rhine-Westphalia, in 2004. As is evident from Table 1, there is no time pattern in whether the governments introducing the reform were left-wing or right-wing. Nor was any of the reforms introduced following a change in government.

A particularly interesting feature of the reforms is that the counterfactual to compulsory denominational religious instruction is not to have no value-oriented instruction, but rather to get non-denominational value-oriented instruction (usually called "ethics" or "philosophy" in the school curriculum). As a consequence, the reforms allow us to identify whether it is the religious

part of the instruction, rather than a general value-oriented instruction, that is giving rise to the observed findings.

To exploit these reforms empirically, we merge a dataset of state reforms to two individual-level datasets that allow us to link religious outcomes of individuals in adulthood to their state of schooling in childhood, even if they migrated to other states afterwards. The first dataset is the adult cohort of the National Education Panel Study (NEPS) which provides a panel of over 9,000 adults observed between 2007 and 2016 who entered primary school between 1950 and 1993. The second dataset is the German General Social Survey (ALLBUS) which provides repeated cross-sections of over 16,000 adults observed between 1980 and 2016 who entered primary school between 1950 and 2003. Combining the two datasets for reasons of statistical power, our estimation sample includes up to 25,000 observations. Both datasets allow us to observe individuals' year of birth, state of schooling, and religious outcomes such as subjective religiosity, personal prayer, and church membership. When looking at family and economic outcomes, we extend the analysis to the German Socio-Economic Panel (SOEP) which provides a panel of over 25,000 adults observed between 1984 and 2017 who entered primary school between 1950 and 2004.

Our event-study research design identifies changes in religious outcomes across cohorts that were and were not affected by the reform in compulsory religious education in states with reform events relative to other states without reform events at the same time, after accounting for fixed differences between states and birth cohorts. We implement parametric and non-parametric event-study estimations to disentangle reform effects which happen directly at the time of the reform from those which occur gradually after implementation of the reform. We define a student to be exposed to the reform if the reform was implemented at the year of her primary-school entry. Standard errors are clustered at the state level and estimated by wild cluster bootstrap (Cameron, Gelbach, and Miller (2008)).

We find that the abolishment of compulsory religious education decreased the religiosity of affected students in adulthood. The non-parametric estimates in Figure 1 indicate that individuals who entered school after the reform report significantly lower levels of religiosity. At the same time, equality of pre-trends cannot be rejected. These results are confirmed in the equivalent parametric estimates of the effect of abolishing compulsory religious education on religiosity in Table 2.

An attractive feature of the event-study approach is that including a trend variable relative to the reform constitutes a placebo test of the main identifying assumption, namely that the timing of reforms is as good as random. If reforming states are on a different trend than non-reforming states prior to the reform, this could indicate challenges for identification in the event-study design. However, as the regression estimates show, there is no significant difference in the pre-trend between reforming and non-reforming states. Estimates of the rather demanding specification that allows for both a shift term of the reform, a relative trend, and an interaction between reform and trend suggest that the reform effect phases in gradually over time.

In addition to the overall measure of subjectively reported religiosity, the reform affected actual acts of religiosity. At the informal level, terminating compulsory religious education in schools reduced the incidence of personal prayer in adulthood (Figure 2). At the formal level, the reform reduced religious affiliation (Figure 3). While the effect on prayer again phases in gradually, the effect on affiliation appears to be closer to a one-time shift (Table 3). The reform effects on religiosity and religious affiliation do not differ significantly between males and females (Table 4). By contrast, personal prayer is only affected among females, but not among males.

Beyond the religious sphere, the reform may also affect family and economic outcomes. Given that the churches historically strongly promoted traditional religious family role models, the termination of compulsory religious education may arguably affect people's attitudes towards family and gender roles in our setting. By affecting women's choices to become housewives or participate in the labor market, the reform may thus affect gender equity.

Results in Table 5 show that abolishing compulsory religious education decreased the likelihood that males think that men are better suited for certain professions than women and increased the likelihood that males think that men and women should have the same duties in the home. Effects on females' views about family and gender roles point in the same direction but are smaller and do not reach statistical significance. Thus, the reform decreased conservative views about family and gender roles among male adults. Likewise, the reform reduced the view that people should get married if they live with a partner permanently, in particular among males (Table 6). Thus, the reform effects extend to attitudes beyond the pure religious sphere. Consistent with the decrease in conservative family attitudes, the reform affected actual family outcomes, reducing males' likelihood of getting married and the number of children. Ultimately,

the reform also had positive effects on female labor-market participation, employment, and earnings (Table 7).

Supporting our identifying assumption, the reform is not related to placebo outcomes such as height, weight, or difficulties with climbing stairs or other strenuous activities. Similarly, the reform is not significantly related to non-religious school outcomes such as type of school degree, school attendance abroad, years of schooling, or age of first employment. In addition, there is no evidence of effects on political outcomes such as political interest, left-right voting patterns, or satisfaction with democracy, nor on behavioral outcomes such as measures of prosociality, reciprocity, trust, risk, volunteering, and life satisfaction.

Our study contributes to several strands of the literature. First, studies in the economics of religion have shown the importance of religion and religiosity for outcomes such as economic development and personal outcomes (see Barro and McCleary (2003) and McCleary and Barro (2006a) for a cross-country setting and Becker and Woessmann (2009, 2018) for the German historical context). Recent studies on the determinants of religiosity and the demand for religious services have investigated, among others, effects of secular competition (Gruber and Hungerman (2008)), economic deprivation (Becker and Woessmann (2013)), printing technology (Rubin (2014)), and the performance of pastors (Engelberg et al. (2016)). Several papers have studied the interrelationship between education and religion in different contexts (Brown and Taylor (2007); Glaeser and Sacerdote (2008); Chaudhary and Rubin (2011); Hungerman (2014); Franck and Iannaccone (2014); Meyersson (2014); Becker, Nagler, and Woessmann (2017)). To the extent that they study an effect of education on religion, these papers focus on effects of the level of education in general. Here, we focus on a different aspect, namely the effect of religious education in the school curriculum as a more direct means by which schools may affect religious outcomes.

Second, the political economy of state schooling studies why states take over control of school curricula, modeling aspects such as totalitarian indoctrination (Lott (1999)), social cohesion (Gradstein and Justman (2002)), and socialization (Pritchett and Viarengo (2015)). Focusing on the relationship of church and state beyond education, Barro and McCleary (2005) study determinants of state religions and investigate their effects on religiosity (McCleary and Barro (2006b)).

Third, a broad literature in the economics of education studies the impact of different school reforms on respective outcomes (e.g., Hanushek (1986); Woessmann (2016)). While this literature has traditionally looked at students' cognitive achievement and later labor-market success, more recent contributions also focus on a range of non-cognitive outcomes such as personality traits (e.g., Almlund et al. (2011)) and soft skills (e.g., Koch, Nafziger, and Nielsen (2015)). Relatedly, an emerging literature in behavioral economics studies how economic preferences, personality traits, and values emerge and develop during childhood and adolescence (Sutter and Kocher (2007); Dohmen et al. (2012); Fehr, Glätzle-Rützler, and Sutter (2013); Lergertporer et al. (2014)). Kosse et al. (2019) study how prosociality and other behavioral traits and attitudes are affected by a mentoring intervention. Closest in spirit to our study, Cantoni et al. (2017) investigate how a curricular reform of Chinese textbooks affected students' political attitudes. We contribute to this literature by studying how school curricula reforms can affect outcomes beyond traditional achievement measures, namely religious attitudes in the long run.

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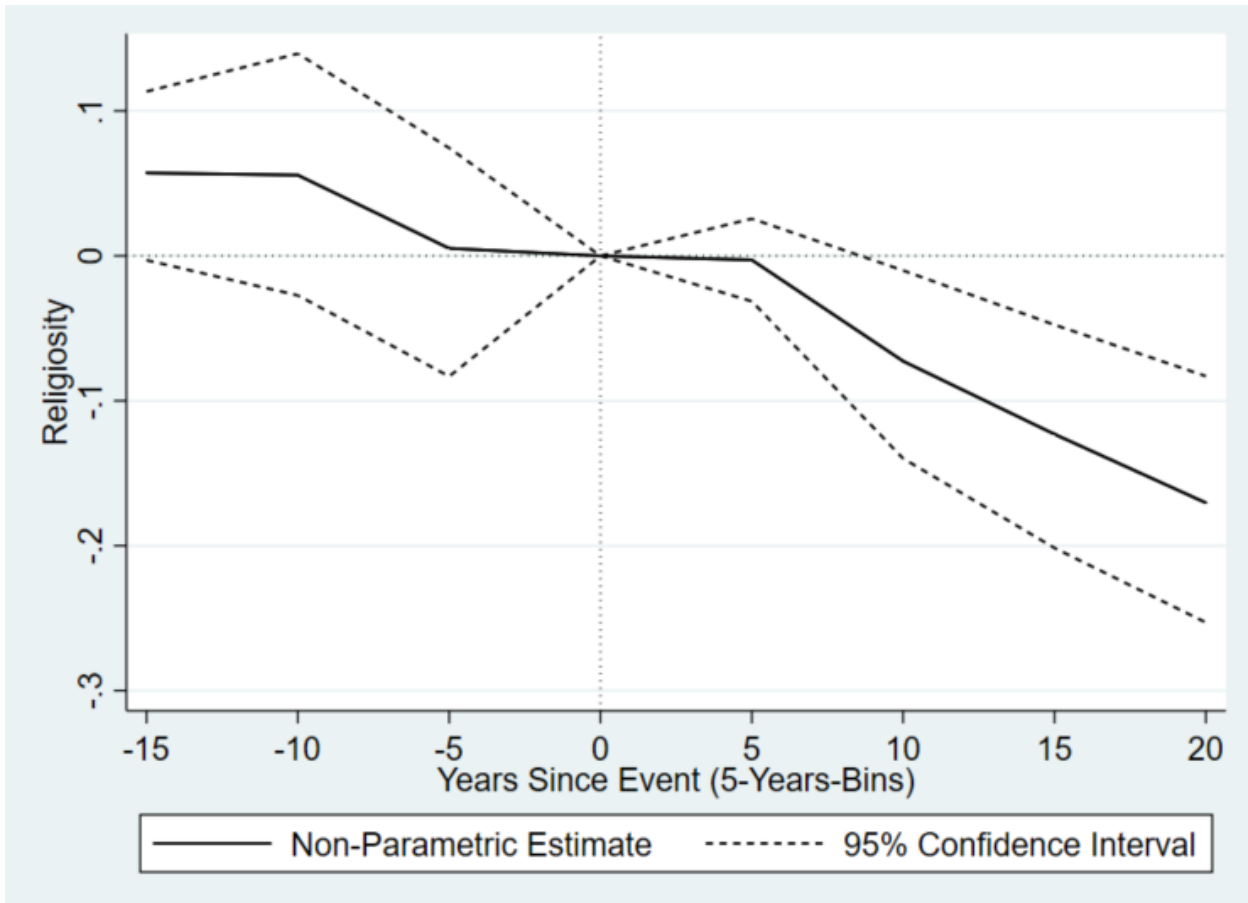
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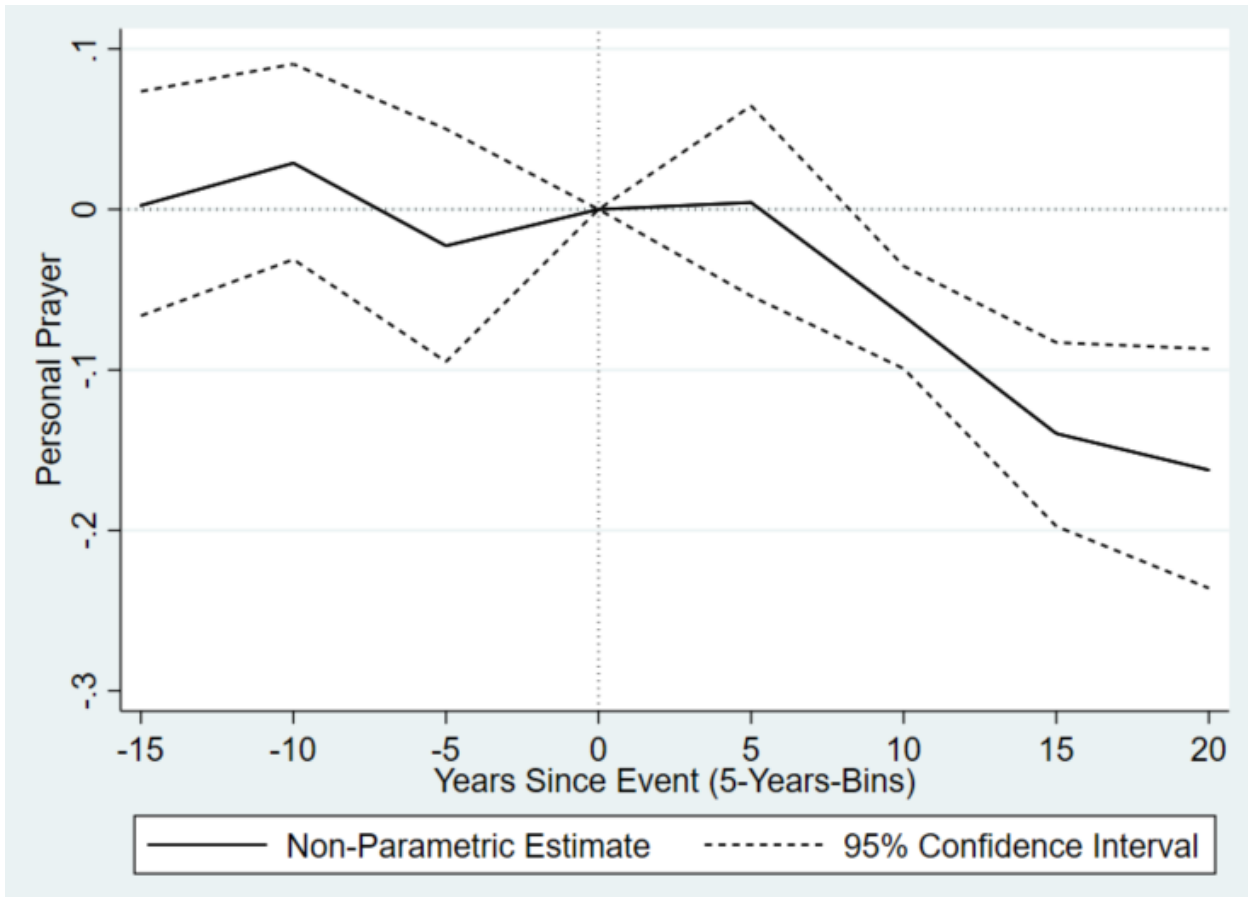


**Figure 1: The effect of abolishing compulsory religious education on religiosity:  
Non-parametric event-study estimates**



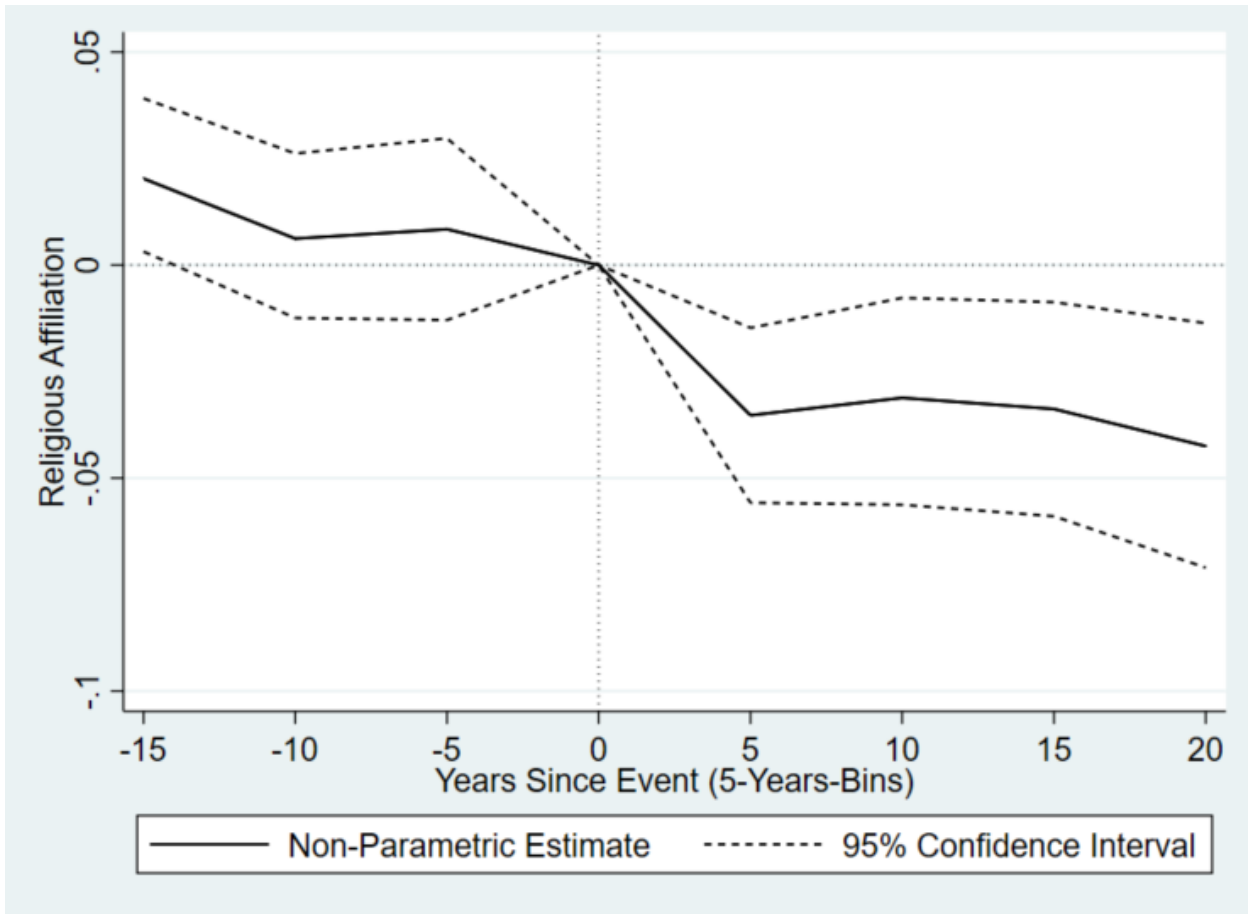
Notes: Coefficients from non-parametric event-study regressions and their 95% confidence intervals. Dependent variable: religiosity (standardized, based on 4-point-scale NEPS question “How religious are you?” and 10-point-scale ALLBUS question “Would you say that you are rather religious or rather not?”). Numbers on horizontal axis refer to final year of respective five-year bins; i.e., 0 = last five years prior to treatment (excluded category), 5 = first five years of treatment. The  $p$  values of omnibus hypothesis tests of zero pre- and post-event effects are 0.479 and 0.000, respectively. Data source: National Education Panel Study (NEPS), Cohort 6; German General Social Survey (ALLBUS) Cumulation 1980-2016.

**Figure 2: The effect of abolishing compulsory religious education on personal prayer:  
Non-parametric event-study estimates**



Notes: Coefficients from non-parametric event-study regressions and their 95% confidence intervals. Dependent variable: personal prayer (standardized, based on 7-point-scale NEPS question “How often do you pray?” and the same 11-point-scale ALLBUS question). Numbers on horizontal axis refer to final year of respective five-year bins; i.e., 0 = last five years prior to treatment (excluded category), 5 = first five years of treatment. The  $p$  values of omnibus hypothesis tests of zero pre- and post-event effects are 0.838 and 0.000, respectively. Data source: National Education Panel Study (NEPS), Cohort 6; German General Social Survey (ALLBUS) Cumulation 1980-2016.

**Figure 3: The effect of abolishing compulsory religious education on religious affiliation:  
Non-parametric event-study estimates**



Notes: Coefficients from non-parametric event-study regressions and their 95% confidence intervals. Dependent variable: religious affiliation (indicator variable, based on NEPS question “Do you belong to a faith or religion?” and ALLBUS question “Which religious denomination do you belong to?”). Numbers on horizontal axis refer to final year of respective five-year bins; i.e., 0 = last five years prior to treatment (excluded category), 5 = first five years of treatment. The  $p$  values of omnibus hypothesis tests of zero pre- and post-event effects are 0.274 and 0.000, respectively. Data source: National Education Panel Study (NEPS), Cohort 6; German General Social Survey (ALLBUS) Cumulation 1980-2016.

**Table 1: Religious education reforms and ruling parties**

State and year of reform	Ruling parties	
	Legislation period before reform	Legislation period of reform
Bavaria (1972)	CDU (1966-1970)	CDU (1970-1974)
Lower Saxony (1974)	SPD (1970-1974)	SPD, FDP (1974-1976)
Rhineland-Palatinate (1977)	CDU (1971-1975)	CDU (1975-1979)
Hesse (1977)	SPD, FDP (1970-1974)	SPD, FDP (1974-1978)
Baden-Württemberg (1983)	CDU (1976-1980)	CDU (1980-1984)
Schleswig-Holstein (1992)	SPD (1988-1992)	SPD (1992-1996)
Hamburg (2004)	CDU, PRO, FDP (2001-2004)	CDU (2004-2008)
North Rhine-Westphalia (2004)	SPD, Grüne (1995-2000)	SPD, Grüne (2000-2005)

**Table 2: The effect of abolishing compulsory religious education on religiosity: Parametric event-study estimates**

	(1)	(2)	(3)
Reform	-0.072** [0.034]	-0.072* [0.078]	0.015 [0.626]
Years relative to reform		-0.000 [0.946]	0.001 [0.626]
Reform x Years relative to reform			-0.012*** [0.002]
State fixed effects	Yes	Yes	Yes
Birth-year fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	15,708	15,708	15,708

Notes: Event-study regressions with state and birth-year fixed effects. Dependent variable: religiosity (standardized, based on 4-point-scale NEPS question “How religious are you?” and 10-point-scale ALLBUS question “Would you say that you are rather religious or rather not?”). Controls: gender, migration status, mother’s education, and father’s education.  $p$  values with clustering at the state level based on wild cluster bootstrap  $t$ -procedure in square brackets (Cameron/Gelbach/Miller 2008; 1000 repetitions with null imposed; Stata command `cgmwildboot` by Judson Caskey). Data source: National Education Panel Study (NEPS), Cohort 6; German General Social Survey (ALLBUS) Cumulation 1980-2016.

**Table 3: The effect of abolishing compulsory religious education on prayer and religious affiliation: Event-study estimates**

	Personal prayer			Religious affiliation		
	(1)	(2)	(3)	(4)	(5)	(6)
Reform	-0.051** [0.028]	-0.049* [0.076]	0.035 [0.174]	-0.039*** [0.006]	-0.043*** [0.002]	-0.041*** [0.002]
Years relative to reform		-0.001 [0.632]	0.000 [0.912]		0.002* [0.052]	0.002** [0.036]
Reform x Years relative to reform			-0.012*** [0.002]			-0.000 [0.684]
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Birth-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,287	13,287	13,287	25,168	25,168	25,168

Notes: Event-study regressions with state and birth-year fixed effects. Dependent variable: columns (1)-(3): personal prayer (standardized, based on 7-point-scale NEPS question “How often do you pray?” and the same 11-point-scale ALLBUS question); columns (4)-(6): religious affiliation (indicator variable, based on NEPS question “Do you belong to a faith or religion?” and ALLBUS question “Which religious denomination do you belong to?”). Controls: gender, migration status, mother’s education, and father’s education. *p* values with clustering at the state level based on wild cluster bootstrap *t*-procedure in square brackets (Cameron/Gelbach/Miller 2008; 1000 repetitions with null imposed; Stata command `cgmwildboot` by Judson Caskey). Data source: National Education Panel Study (NEPS), Cohort 6; German General Social Survey (ALLBUS) Cumulation 1980-2016.

**Table 4: Effects on religious attitudes by gender**

	Religiosity (1)	Personal prayer (2)	Religious affiliation (3)
Reform	-0.076*** [0.004]	0.001 [0.934]	-0.031* [0.054]
Reform x Female	0.008 [0.796]	-0.099*** [0.006]	-0.015 [0.160]
State fixed effects	Yes	Yes	Yes
Birth-year fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	15,708	13,287	25,168

Notes: Event-study regressions with state and birth-year fixed effects. Dependent variable: see column headers. Controls: gender, migration status, mother's education, and father's education.  $p$  values with clustering at the state level based on wild cluster bootstrap  $t$ -procedure in square brackets (Cameron/Gelbach/Miller 2008; 1000 repetitions with null imposed; Stata command `cgmwildboot` by Judson Caskey). Data source: National Education Panel Study (NEPS), Cohort 6; German General Social Survey (ALLBUS) Cumulation 1980-2016.

**Table 5: The effect of abolishing compulsory religious education on attitudes towards gender roles: Event-study estimates**

	Different gender suitability for professions	Different gender duties in the home
	(1)	(2)
Reform	-0.094** [0.030]	-0.098** [0.034]
Reform x Female	0.031 [0.416]	0.053 [0.174]
State fixed effects	Yes	Yes
Birth-year fixed effects	Yes	Yes
Controls	Yes	Yes
Observations	8,542	8,529

Notes: Event-study regressions with state and birth-year fixed effects. Dependent variable: column (1): different gender suitability for professions (standardized, based on 4-point-scale agreement to statement “Men are better suited for certain professions than women”); column (2): different gender duties in the home (standardized, based on inverted 4-point-scale agreement to statement “Men and women should have the same duties in the home”). Controls: gender, migration status, mother’s education, father’s education, and survey year. *p* values with clustering at the state level based on wild cluster bootstrap *t*-procedure in square brackets (Cameron/Gelbach/Miller 2008; 1000 repetitions with null imposed; Stata command `cgmwildboot` by Judson Caskey). Data source: National Education Panel Study (NEPS), Cohort 6.



**Table 6: The effect of abolishing compulsory religious education on family outcomes: Event-study estimates**

	Attitude: should get married if living with partner permanently	Married (ever)	Number of children
	(1)	(2)	(3)
Reform	-0.163*** [0.002]	-0.023*** [0.002]	-0.175*** [0.002]
Reform x Female	0.082** [0.020]	0.032*** [0.000]	0.130*** [0.000]
State fixed effects	Yes	Yes	Yes
Birth-year fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	14,920	56,558	49,425

Notes: Event-study regressions with state and birth-year fixed effects. Dependent variable: column (1): “Do you think one should get married if one is living with a partner on a permanent basis?” (standardized, 3-point-scale in ALLBUS, 4-point scale in SOEP); column (2): currently married, divorced, or widowed (0=never married); column (3): number of children. Controls: gender, migration status, mother’s education, father’s education, and survey year. *p* values with clustering at the state level based on wild cluster bootstrap *t*-procedure in square brackets (Cameron/Gelbach/Miller 2008; 1000 repetitions with null imposed; Stata command `cgmwildboot` by Judson Caskey). Data sources: National Education Panel Study (NEPS), Cohort 6; German General Social Survey (ALLBUS) Cumulation 1980-2016; German Socio-Economic Panel (SOEP) Core 1984-2017 (v.34).

**Table 7: The effect of abolishing compulsory religious education on labor-market outcomes: Event-study estimates**

	Labor-force participation (1)	Employment (2)	Earnings (3)
Reform	0.0003 <i>[0.976]</i>	0.007*** <i>[0.006]</i>	-0.074 <i>[0.166]</i>
Reform x Female	0.028*** <i>[0.000]</i>	0.030*** <i>[0.000]</i>	0.256*** <i>[0.000]</i>
State fixed effects	Yes	Yes	Yes
Birth-year fixed effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	58,053	58,053	44,872

Notes: Event-study regressions with state and birth-year fixed effects. Dependent variable: column (1): currently employed or unemployed; column (2): currently employed; column (3): log net monthly earnings. Controls: gender, migration status, mother's education, father's education, and survey year. *p* values with clustering at the state level based on wild cluster bootstrap *t*-procedure in square brackets (Cameron/Gelbach/Miller 2008; 1000 repetitions with null imposed; Stata command `cgmwildboot` by Judson Caskey). Data sources: National Education Panel Study (NEPS), Cohort 6; German General Social Survey (ALLBUS) Cumulation 1980-2016; German Socio-Economic Panel (SOEP) Core 1984-2017 (v.34).