

The between and within effects of social security on church attendance in Europe 1980-1998: a cautionary tale for various fields of research

[Authors' version, accepted for publication in European Sociological Review 2015]

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Abstract

Tests of hypotheses explaining the variation in church attendance are dominated by the use of international comparative survey-data covering many countries with only a limited number of samples within these countries. As a result the main research focus is on between country effects and hardly on within country effects. The latter however comprises a more convincing test, because fewer assumptions about unobserved country specific variables are required. Elaborating on various analytical models, we show that results from a between countries research design may lead to inaccurate conclusions. To illustrate this point, we selected the Mannheim Eurobarometer Trend File, which includes as many European countries on as many points in time as possible. Step by step we disentangle the well-known strong negative overall between country correlation of social security with church attendance. We show that this correlation most likely is due to unspecified country characteristics, as within countries, social security is sometimes positively related to church attendance and sometimes negatively, whereas on average there is no effect at all. Rather than increases in social security spending, rising Gross Domestic Product seems to reduce church attendance. Our cautionary tale about the use of between country research designs applies to other fields of research as well.

1. The relationship between social security and religious involvement

The explanation of religious behavior, like church attendance, has been subject of research within the field of sociology for a long time. As in many scientific disciplines, it evoked fierce debates on where to look for answers. The Secularization Theory or Modernization Theory is one of the classical theories to explain the (historical) variation in church attendance. Although the exact mechanism remains part of the debate among scholars, the basic idea is that increasing modernity has undermined the social significance of religion (Wilson, 1966). Peter Berger, one of the founders of Secularization Theory (1969), found little evidence for the decline in religion, except in Western European countries (1997). According to Berger, researchers should not question why in most countries religion has not declined, but why it did so in those European countries. Many sociologists have done just that; they have examined if and why in Western Europe secularization did take place (for example De Graaf and Need, 2000; Halman and Draulans, 2006; Pollack, 2008; Pollack and Pickel, 2007). Although Bruce (2002; 2011) argues that secularization theory is rather complex and contains various aspects, Ruiter and Van Tubergen (2009) were able to distinguish three main mechanisms of the effects of modernization on religious commitment. The first is the modernization of ideologies according to which the traditional religious worldview is slowly replaced by the modern, scientific, secular worldview. The second is the modernization of social ties, according to which social ties become weaker and social networks lose their density and homogeneity. As a consequence, religious networks have less control over their members, which leads to decreasing religious commitment. The last mechanism is the modernization of economics. Most modern nations provide to their inhabitants a certain (high) degree of security, financially, politically, and socially. Because people feel more secure, the need for religion diminishes. Recently these three hypotheses have been tested with the use of a large data set including 26 European countries (Immerzeel and Van Tubergen, 2013). In line with expectations, this study found social security to have a negative effect on church attendance: the higher social security rates in a country, the less its population on average attended church. The authors however acknowledge that their conclusions are tentative and may be prone to spuriousness. The focus of this paper concerns a critical assumption that had to be made, namely that the effect of social security *between* countries reflects also a *within* country effect. In other words, it is assumed that unobserved country specific factors are not responsible for this between country effect. If this assumption is violated, then the claim of a causal effect of social security is seriously undermined. In Figure 1 we show a clear hypothetical example of such a violation.

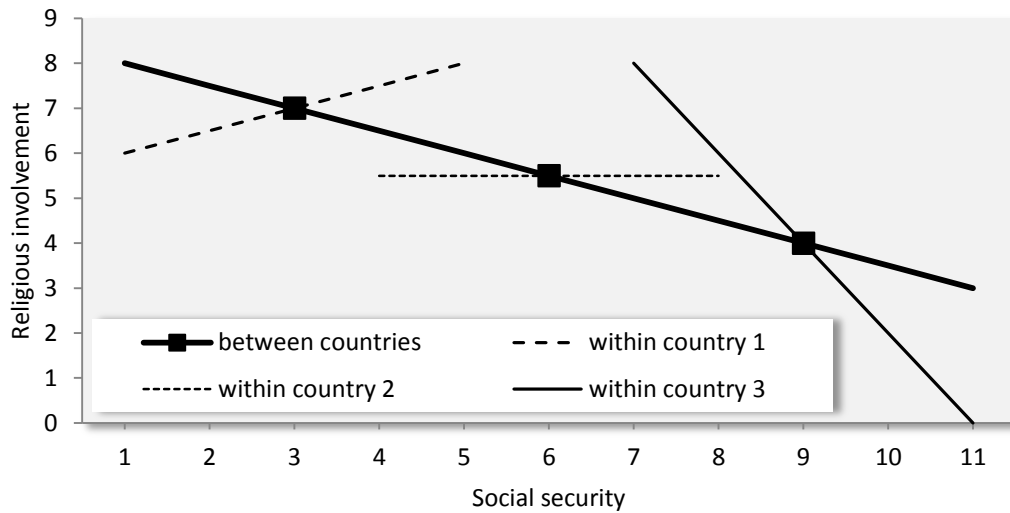


Figure 1 The negative between country effect of social security on religious involvement and three possible within country effects (a positive within effect in country 1, a null within effect in country 2, and a negative within effect in country 3)

The thick black line represents the between country effect of social security on religious involvement that may be found in a collection of cross-national samples. This between country effect is negative: *high average* social security rates go together with *low average* church attendance rates. The other three lines represent within country effects. Within country 1 and 2 the direction of these effects contradicts the negative between country effect as they are positive (1) or null (2). It is important to note that strength and direction of the within country effects may have no statistical relationship with the between country effect. So, we may have a situation where the between country effect is clearly negative while within country effects are positive, negative or even absent.

In this paper we will demonstrate that in the analyses of the relationship between social security and church attendance such paradoxical outcomes exist. To show how this is possible we will start from very basic analytical models and end with a multilevel model (Snijders and Bosker, 2012). To our understanding this is currently the most appropriate research design to measure the causal effect of contextual characteristics like social security on the behavior of individuals (see also Fairbrother, 2014).

In sum, the question we aim to answer is, *do higher social security rates lower individual religious involvement (i.e., church attendance)?* Our contribution shows that it is crucial to make a distinction between within and between effects in order to be able to give a more accurate causal answer. Answers exclusively based on between country effects bear the danger of drawing invalid conclusions.

2. Theory and hypotheses

There are several mechanisms that may explain variation in church attendance. In this section we give a brief overview of the relevant theories and related hypotheses.

Secularization theory in contemporary sociology is more of an umbrella under which several mechanisms of the influence of modernization on religious behavior can be found (Bruce, 2011; De Graaf, 2013). The general axiom of secularization theory is that religion in all of its aspects is losing importance in modern day life (Bruce, 2002). This decline in religion can be explained by different mechanisms of modernization. Ruiter and Van Tubergen (2009) were able to distinguish three different mechanisms in the literature: the modernization of ideologies, the modernization of social ties, and the modernization of economies.

The theory of modernization of economies is related to our main research question, namely the effect of security on religious involvement. Norris and Inglehart (2004) suggest that modernization provides more security, politically, materially, and more importantly financially, which in turn make individuals less religious. So religious involvement may decline in post-industrialized nations because of an increase in (existential) security. Norris and Inglehart (2004) state that the negative effect of security on religion operates on both the societal level as on the individual level. With more security and wealth, provided by the state, or provided by their personal level of wealth, people feel more in control of their lives and feel less inclined to go to church. To evaluate this theoretical notion we test three hypotheses: *individuals will attend religious meetings less often, the more their governments spend on social welfare (H1a), the higher their own income (H1b), and the higher their country's Gross Domestic Product (H1c).*

Modernization of ideologies is probably the oldest identified mechanism of secularization and is rooted in the works of Max Weber ([1922] 1993). In short, it is assumed that traditional religious worldviews are undermined by scientific rationalism, and makes way for a more active, mechanical worldview. One of the places where this undermining takes place is at school. Pupils are taught critical thinking, and learn about the theory of evolution for instance, which is at odds with traditional belief systems. In this sense, modernity would lower levels of religious beliefs and behavior (Weber, [1922] 1993; Need and De Graaf, 1996; Stark, Iannaccone, and Finke, 1996). This leads to our fourth hypothesis to be tested:

The more educated people are, the less often they will attend religious meetings (H2a).

This hypothesis has been tested many times before and at best mixed results have been found. Some studies suggest that there is a negative effect on religiosity (Stroope, 2011), while others find positive effects on religious attendance (Schwadel, 2011), small negative effects (Ruiter and Van Tubergen, 2009; Immerzeel and Van Tubergen, 2013) or no significant effect at all, after controlling for contextual characteristics (Te Grotenhuis and Scheepers, 2001).

Besides the educational effect at the individual level, it seems reasonable to expect a contextual effect as well. Firstly, In a country where educational levels are high on average, even citizens with lower educational

attainment are likely to be exposed to a scientific worldview and this may in turn lead to lower levels of religious attendance. Secondly, the average level of education reflects to some extent a country's level of modernization which is assumed to influence religious involvement. Thirdly, the average educational levels in a country may very well be related to social security levels so it may function as a relevant control variable as well. Therefore our fifth hypothesis reads:

The higher the average level of education in a country, the less often individuals will attend religious meetings (H2b).

The third branch of the secularization theory is the *modernization of social ties*. This mechanism assumes that religion is mainly a social phenomenon while people will internalize the norms that are considered relevant in their social networks. People in a religious environment are assumed to comply more strongly with religious norms than in a more secular environment. A notion that dates back as far as the works of Durkheim (1912), see also Van Tubergen, Te Grotenhuis and Ultee, (2005) for an empirical test. One way to test this hypotheses is to look for differences in social ties in urban and in rural settings. In rural environments, social ties are more intense, multiplex, and kin-based, and the networks are more dense and homogeneous (Ruiter and Van Tubergen, 2009). These conditions lead to more normative pressure towards conformity (Marsden, 1987). In urbanized areas, social relations tend to be weaker and more heterogeneous. So people who live in a rural environment are influenced by the stronger family and community bonds, and thus remain more religious. This leads to our sixth hypothesis:

People who live in urbanized settings will attend religious meetings less frequently compared to people who live in rural settings (H3a).

Ruiter and Van Tubergen (2009) further found over and above the effect of living in a rural environment on religious behavior, a similar effect at the country level. The argument is that in more urban countries, people have higher job mobility and more opportunity to move which weakens social ties. In more rural countries, people remain to live close to their birth ground, because of lower job mobility. The relationships remain more kin-based, social control is more strict and enforcing social norms more eminent. The last hypothesis therefore reads:

People who live in more urbanized countries will attend religious meetings less frequently compared to people who live in more rural countries (H3b).

We present an overview of our hypotheses in Figure 2.

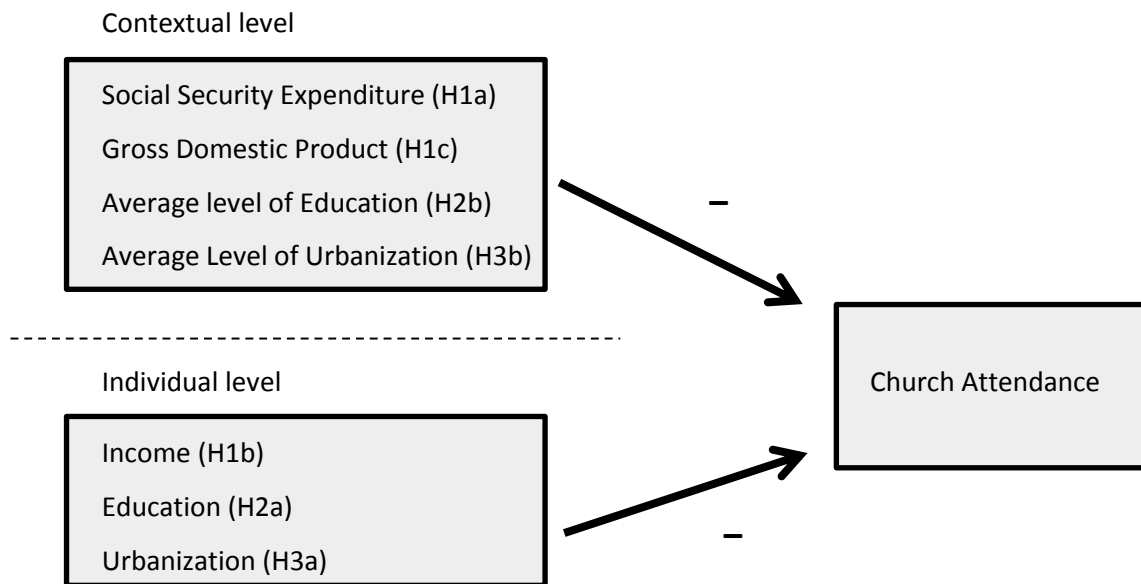


Figure 2 Hypotheses to be tested (– = reducing church attendance)

3. Data

To adequately use the analytical models, we looked for a dataset that includes as many European countries on as many points in time (waves) as possible. The dataset that constitutes the best tradeoff between the number of (comparable) countries and number of waves is *The Mannheim Eurobarometer Trend File* (Schmitt, Scholz, Leim, and Moschner, 2008). The project is an initiative of the Mannheim Zentrum für Europäische Sozialforschung (MZES) and the Zentrum für Umfragen, Methoden und Analysen (ZUMA), and combines the most important trend questions of the Eurobarometer surveys conducted between 1970 and 2002, as well as numerous demographic variables, such as age, sex, marital status, educational level, income, and also religion. After the deletion of countries with few waves we ended up with close to 190,000 respondents from 9 European countries (i.e., Belgium, Denmark, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, and the UK) covering the 1980-1998 period. In all nine European Union member countries, national samples were drawn from the national population of 15 years and older on the basis of a multi-stage, random (probability) sample design. Interviews were conducted face-to-face in respondents' homes in the appropriate national language. We supplemented these data with social security expenditure rates and Gross Domestic Product figures from *OECD Statistics* (2013) for the period 1980-1998.

Dependent variable

In the Eurobarometer surveys, religious attendance was measured by asking respondents how often they attended religious services. Answers were given on an ordinal scale, including "never" (0), 1 "once a year", 2 "a few times a year" 3 "once a week" 4 "several times a week". Unfortunately, church attendance was

measured within Christian denominations only. In order not to lose statistical power, we gave all individuals who were not affiliated to any denomination, the lowest score on church attendance (i.e., 0=never).¹ The variable was not always included in the questionnaire of every wave. As a result the number of waves was limited to twelve: 1980, 1981, 1985, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, and 1998, which still is the longest and most detailed longitudinal dataset possible given the nine countries. After reviewing the bivariate relationship between church attendance and our predictor variables with the use of scatterplots and statistical tests of non-linearity, church attendance in this study is considered to be interval scaled. Church attendance rates are known to be overestimated in conventional surveys (Chaves and Stephens 2003) and this implies a potential source of measurement error. Interestingly, this overrepresentation however especially applies to the United States and Canada and not so much to Europe (Brenner 2012: 373-374). Furthermore, Brenner (2012) showed that even in case of serious overestimations of church attendance, this does not affect the estimates of demographic predictors. Hence, given our focus on European countries and the unlikelihood of systematic over reporting affecting effect sizes, we are less worried about this source of measurement error.

Furthermore, we like to note that for the comparison of the between and within country effects, in our multilevel models the relationship between church attendance and the predictor variables is assumed to be non-recursive.

Individual independent variables

Education was measured by the number of years respondents went to school. The observations, in years, ranged between 14 (or less) and 22 (or more). Respondents who were still at school or were studying at the time of the interview received the score of their current age minus 6 with a maximum of 22. As a result the variable ranges from 9 to 22 years of education. Although the score 14 means '14 years or less' for respondents who completed their education, and 22 means '22 years or more', we treat this variable as being continuous. The percentage of missing cases is about 6%. This is mainly due to an error in the data collection process that had led to no valid observations for the wave in 1995.

Economic security was measured by asking the respondents about their household income per month. Unfortunately, in the trend file national currencies are being used while the categorization of income classes is country and wave specific. For these reasons, it is very difficult to harmonize and standardize the income variable. Therefore we decided to estimate a unique income effect for each country separately (see paragraph 4). Because the number of missings on the income variable is high (about 25%), we used multiple imputation (Rubin, 1987) to get estimates for these missings. After imputation, the percentage of missings was down to less than 1%.²

Urbanization has twelve categories; it ranges from very small rural communities (2000 inhabitants or less) to big cities or capitals (500.000 or more) and was measured in all years except 1981 (missings 5.5%). We will treat this variable also as continuous. We like to note that the way of categorization differs across years

and countries in the data file. It is very likely that this introduced measurement error and consequently resulted in an underestimation of the effects for urbanization in our analytical models.

Contextual independent variables

We use four contextual variables: social security expenditure, Gross Domestic Product (GDP), level of urbanization, and average educational level. *Average Educational level* and *level of urbanization* were retrieved from the trend file itself by means of aggregation to the nation/wave level. So, within each country and for every year (wave) we calculated from the individual answers the average years of education and the average level of urbanization. *Social security expenditure* was retrieved from *OECD Statistics*. This is defined as the public total % of Gross National Product that is spent on social security per year, per country (OECD, 2013a). Gross Domestic Product (GDP) was also retrieved from OECD (2013b). We took the total GDP which is measured in million US dollar using 2005 prices and PPP's. We summarized all variables in Table 1.

Table 1 Descriptive statistics for all variables

	n	min.	max.	mean	std. dev.
Contextual variables					
Average Church Attendance (1)	107	.77	2.99	1.59	.57
Social Security	107	12.33	29.45	21.62	4.11
Gross National Product	107	4,735.64	1,368,910.41	399,345.99	424,456.80
Average Urbanization (2,4)	98	2.07	7.27	3.46	1.17
Average Educational Level (3,4)	98	16.20	19.89	17.51	.80
Individual variables					
Church Attendance	187,389	0	4	1.57	1.26
Urbanization (2)	176,772	1	12	3.37	2.12
Educational Level (4)	177,199	9	22	16.76	3.11
Income (5)					
Belgium	21,298	1	12	5.89	2.79
Denmark	21,414	1	12	6.69	3.45
France	21,441	1	12	7.22	3.17
Greece	20,930	1	12	6.22	3.18
Luxembourg	9,204	1	12	7.28	3.39
Ireland	21,823	1	12	7.18	2.87
Italy	22,696	1	12	6.13	3.01
Netherlands	21,160	1	12	7.26	3.29
UK	27,423	1	12	7.45	3.26

(1) not available in Greece in 1980

(2) not available in all countries in 1981

(3) not available in all countries in 1995

(4) average urbanization and average educational level were aggregated from the full individual data set (n=177,199 (education) and n=176,772 (urbanization))

(5) income (including imputation, cf. note 2) is presented per country while pooled across all 5 iterations

4. Analytical models

Ecological analysis

To measure the relationship between social security and church attendance, we first combined all waves and computed the average social security and the average church attendance per country. The resulting nine (country) data points show a rather strong and almost linear negative between country effect of social security on church attendance (see Figure 3).

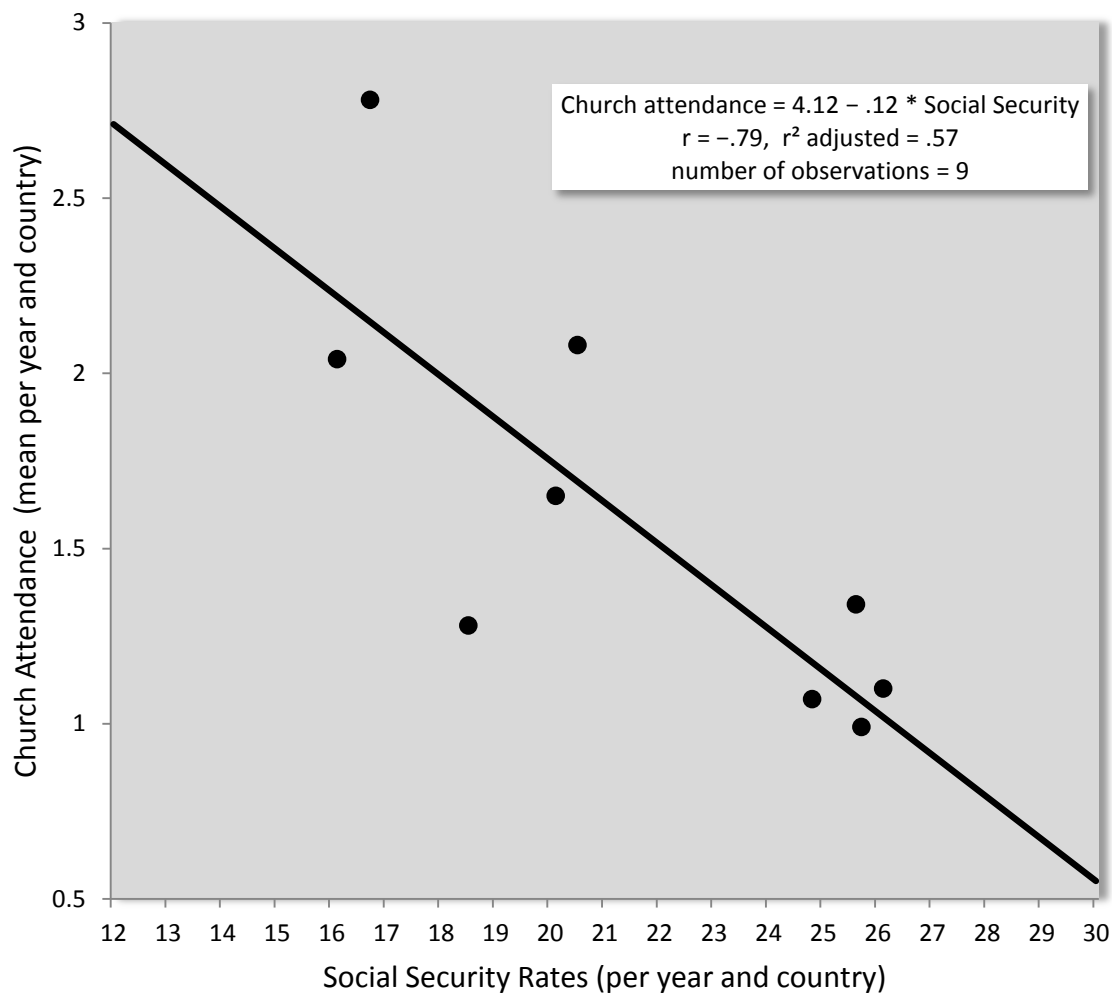


Figure 3 The between country effect of average social security rates on average church attendance based on the information from 9 countries (all 12 waves combined)

The Pearson correlation in Figure 3 amounts to a significant $-.79$, which is not unusually high for this kind of analyses (Robinson, ([1950] 2009). We also calculated the Pearson correlation per wave and again found in each of the 12 waves strong negative correlations (ranging between $-.53$ in 1985 and $-.85$ in 1992) which are significant in 9 cases (see Table 2 for details).

Table 2 *The between country correlation of social security and church attendance: combined and per wave*

	Pearson's correlation	p-value (two-tailed)
Between country effect		
9 countries, all waves combined (see also Figure 3)	-.79	.010*
Between country effect per wave		
(8 countries for 1980, 9 countries for all other years)		
1980	-.60	.115
1981	-.54	.134
1985	-.53	.139
1988	-.59	.097*
1989	-.60	.085*
1990	-.80	.010*
1991	-.83	.006*
1992	-.85	.004*
1993	-.84	.005*
1994	-.83	.006*
1995	-.82	.007*
1998	-.73	.026*

* Significant at $\alpha = .10$ two-tailed

So, regardless of whether one analyses the relationship between social security and church attendance with countries as unit of analysis and all twelve waves combined or alternatively, one analyses the same relationship in each and every wave separately, the conclusion is the same: there is a strong negative correlation between social security and church attendance.

Next, we plotted all 107 observations at the country-wave level (there are twelve waves and nine countries which normally yields 108 combinations, only Greece has no observation for 1980). As Figure 4 shows, the relationship again is strong: the higher social security rates, the lower the mean church attendance in a given country and wave combination. The Pearson correlation amounts to $-.72$ ($p < .01$). Note that the correlation is somewhat lower compared to the correlation in Figure 3 ($-.79$), which is the direct result of analysing at a lower level of aggregation (Robinson, ([1950] 2009).

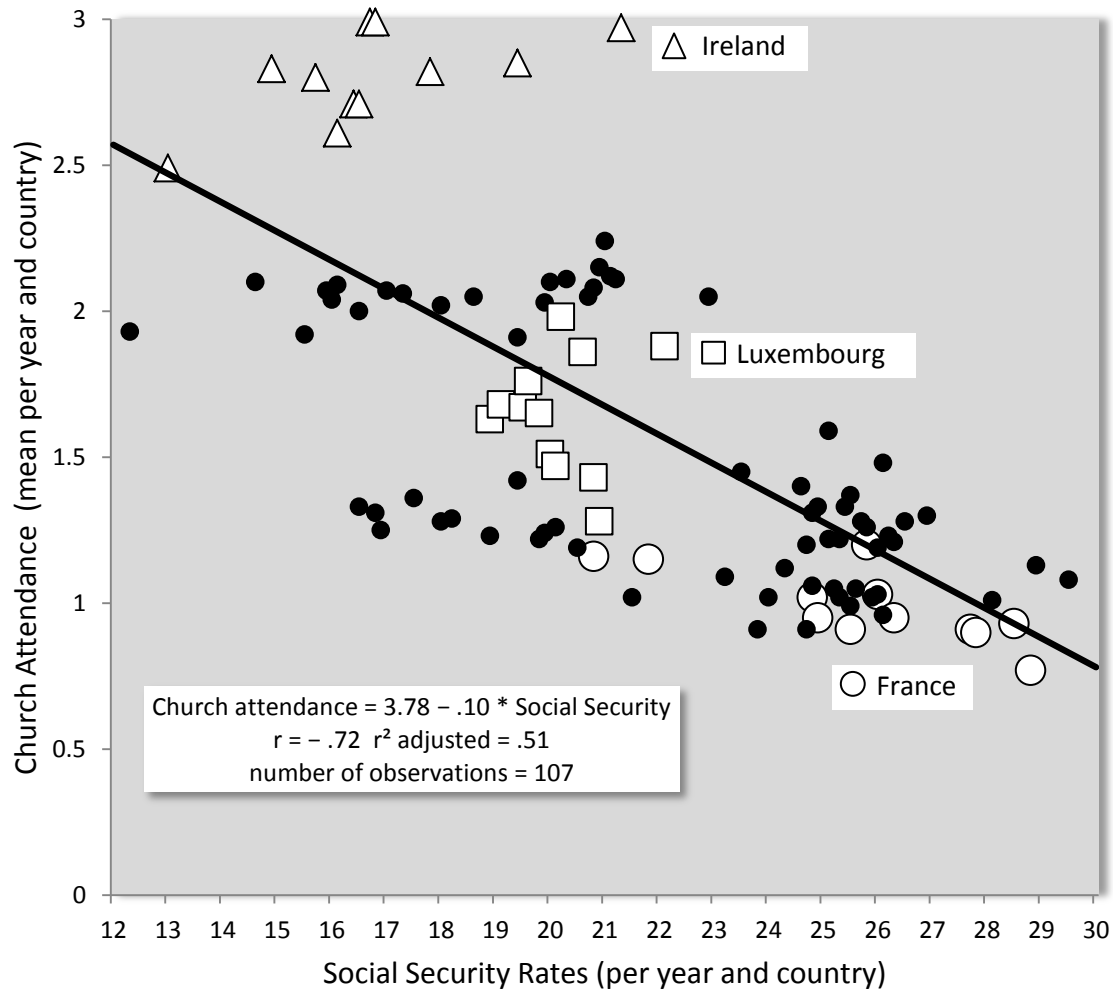


Figure 4 The between country-wave effect of social security rates on mean church attendance based on 107 observations from 9 countries and 12 waves, with Ireland, Luxembourg, and France highlighted

However, as illustrated in Figure 4, the data points per country are not scattered across the whole plot nor do they all follow the average negative trend. Instead, they cluster in certain areas and the direction of the trends is quite diverse. For instance, the data points for Ireland can be found in the upper left corner of Figure 4 and show a positive tendency, while Luxembourg is found in the middle, without an apparent tendency, whereas the data points from France are in the lower right corner showing a negative tendency. All other countries are also clustered in a similar way in Figure 4 (results not shown). So, the next question is whether the negative between country-wave correlation is (partly) spurious due to country-specific differences. To have a first indication, we again analysed all 107 wave/country combinations, but this time we estimated the effect of social security while controlling for unspecified country differences in an OLS regression analysis with country fixed-effects.³ The standardized beta coefficient turned out to be only $-.01$

($p = .914$). This means that, on average, the within country effect of social security is approximately zero over the nine countries in our sample.

This country controlled effect, or within country effect, may be the net result of positive and negative within country effects that counter balance each other. So we calculated the nine within country correlations and they appeared to run between $-.77$ and $+.64$. Interestingly, only the positive correlation in Ireland and the negative correlations in Belgium, France and UK (after deletion of an influential case (Van der Meer, Te Grotenhuis, Pelzer, 2010)) reach significance when using a two-tailed t-test with $\alpha=.10$. We note that the average of all nine within country correlations ($-.01$) is equal to the (rounded) OLS country controlled effect of $-.01$. We refer to Table 3 for all details.⁴

Table 3 *The within country correlation of social security on church attendance per country*

	Pearson correlation	p-value (two-tailed)
Belgium (number of waves (n) =12)	-.53	.074*
Denmark (n=12)	-.11	.731
France (n=12)	-.77	.003*
Greece (n=11)	.49	.128
Italy (n=12)	.40	.193
Ireland (n=12)	.64	.025*
Luxembourg (n=12)	.05	.871
Netherlands (n=12)	.18	.585
United Kingdom (n=12)	-.42	.171
United Kingdom, without influential case (n=11)	(-.75)	(.008*)
Average of all 9 correlations (United Kingdom, n=11 not included)	-.01	

* Significant at $\alpha = .10$ two-tailed

In sum, based on ecological analyses it is highly questionable whether there is a negative causal effect of social security on church attendance. We hold two arguments against it. First, the average within country effect while controlling for unspecified country differences is very close to zero. Second, the within country effects are only significantly negative in three cases: Belgium, France, and the UK. In all other 6 countries the effects run counter to the hypothesis 1a, with even a significant positive effect for Ireland. Based on these results, it seems that the strong negative between country correlations found in Figure 3 and 4, are merely caused by country specific characteristics.

Multivariate multilevel analyses with two levels

The ecological analyses on the country level and country-wave level may not be the most suitable design because individual observations on church attendance were aggregated to a higher level. As a consequence, the possible effects of individual characteristics, which also may be confounding compositional variables on the contextual level, cannot be estimated. Besides, we like to estimate the effect of social security when controlling for GDP, average educational attainment, and average urbanisation. Therefore, our second design is a *multilevel model* that measures both individual and contextual variation. First, we estimated a so-called ‘null-model’ to measure both types of variation. At the individual level the variation in church attendance is 1.20, whereas on the country-wave level the variation is .37. The intra class correlation then equals .24 ($.37 / (.37 + 1.20)$). So, of all variation in church attendance, about 24% is related to the contextual (level 2) level, i.e. country-wave. Next, we added social security as a predictor variable to the model, and consequently the contextual variation dropped from .37 to .20. This means that social security explains about 45% ($100 - (.20/.37) * 100$) of all contextual variation. Note that this is rather close to the explained variance in Figure 4. The standardized effect of social security is $-.72$, which is equal to our previous results (see Figure 4).⁵ Next, we extended the model with Gross Domestic Product, average level of education, and average level of urbanization. For this we have two reasons, firstly, these variables are assumed to influence religious involvement and secondly, they may explain why the effect of social security is negative in the first place. The results show that all four contextual variables have negative, significant effects: the higher social security rates, the higher Gross Domestic Product, the higher the average educational level, and the higher the average urbanisation, the lower people’s religious involvement (see Table 4, Model 1). This corroborates our contextual hypotheses 1a, 1c, 2b, and 3b.

However, the effects of the contextual variables in Model 1 may to some extent be the result of country specific differences. When we take these differences into account it may alter our conclusions profoundly given the results from our ecological analyses. Because we have only nine countries, we decided to use a *fixed effects model* in which the variation at the country level is not measured on an extra third level (Fairbrother, 2014; Schmidt-Catran and Fairbrother, forthcoming) but instead with a set of dummy variables to identify each country (Snijders and Bosker, 2012). This way, we are able to measure the total variance in church attendance at the country level. All variance that is still left unexplained at level 2 (i.e., country-wave) therefore cannot be attributed to country differences. As a consequence, effects on level 2 like that of social security reflect average within country effects.

The results in this fixed effects model are very different from those in Model 1 with regard to social security, average educational level, and average urbanisation. In Model 2 (Table 4) none of them are substantial and none of them reach significance anymore. The only variable that seems to have the expected effect is GDP, which is consistently negative and significant.

Lastly, we extended the fixed effects model with the individual variables: education, urbanisation, and income (see Model 3 in Table 4). To obtain unbiased effects of average educational level and average

urbanisation, the individual educational level and level of urbanisation in one's neighbourhood are mean centred on the country and wave specific means (Snijders and Bosker, 2012). As income is measured in diverse national currencies, the effect of income is measured within each country separately.⁶

We standardized these individual effects using the standard deviation of church attendance at the individual level (i.e., 1.57) and the standard deviations in Table 1, see also note 5.

Table 4 Results from multilevel analyses (individuals at level 1, country-waves at level 2, standardized coefficients are shown)

	M1	M2	M3
<i>Contextual level</i>			
Social security	-.45*	.01	.01
GDP (log)	-.26*	-.92*	-.93*
Education (avg.)	-.34*	.09	.09
Urbanisation (avg.)	-.14*	-.04	-.05
<i>Individual level</i>			
Urbanisation			-.08*
Education			-.02*
Income in:			
Belgium			.01
Denmark			-.03*
France			.00
Greece			-.09*
Ireland			-.05*
Italy			-.06*
Luxembourg			.01
Netherlands			.00
UK			-.01
	n1=166,730 n2=89	n1=166,730 n2=89	n1= 166,728 n2=89

* Significant at $\alpha = .10$ two-tailed

In model 2 and 3 all country dummies (8 in total, with UK as reference) are included, estimates not shown

The level of urbanisation in one's neighbourhood has a significant negative effect on church attendance, which is also true for one's own educational level. This confirms hypotheses 2a and 2b. Household income is found to have a significant negative effect in Denmark, Greece, Ireland, and Italy. For inhabitants of these four countries, hypothesis 1b is corroborated. We like to note that the effects of one's education, urbanisation, and income are rather weak. What is more, the inclusion of the individual variables hardly did change the contextual effect in the previous model. We like to add that in an analysis without the non-affiliates (cf. note 1), model 3 differed in three ways: firstly the effect of average level of urbanisation

became somewhat stronger negative and reached significance ($p = .08$). This may indicate that the effect of urbanisation is only effective among religious affiliated people. Secondly individual educational attainment became weaker and turned insignificant ($p = .16$). This may be an explanation for the mixed results of education discussed in section 2. Thirdly, the effect of income was somewhat stronger and positive for affiliates in the Netherlands, in Luxembourg, and in the UK. All other estimates and p-values remained virtually the same.

For an optimal analysis and in order to make claims about changes in time as a consequence of for example changes in social security, it would be preferable to include time as a covariate at the context level (Fairbrother, 2014). However we like to add that it is very unlikely that time suppresses the negative effect of social security. To have this suppressing effect, time then needs to be positively related to both social security and church attendance. Indeed, social security rates have a tendency to rise over time but as far as we know in most Western countries church attendance declines over time.⁷

6. Conclusions and discussion

This contribution shows that drawing conclusions based on between country effects is risky when hypotheses about variation in church attendance are being tested. When one investigates this variation within countries, results may go in the opposite direction compared to analyses across countries, even when international comparable data includes various waves. In this particular case we have shown that previous conclusions about the between country relationship of social security and religious involvement (cf. Norris and Inglehart, 2004; Immerzeel and Van Tubergen, 2013) are not supported by a within country analysis. Ruiter and Van Tubergen (2009) already mentioned that “the dynamics of religious decline and increase within countries” (p. 887) deserve special theoretical and empirical attention. We have attended to this point, and have shown that indeed more data points within a country are required to reach conclusions about these very dynamics. Our results do not falsify the secularization paradigm altogether, because we included various indicators of modernization. In this study rising Gross Domestic Product, rather than increases in social security spending or rising levels of education and urbanisation, seem to reduce church attendance. This has important theoretical implications, because it brings a weakness of the secularization paradigm to light. Increases in GDP might be the driving forces behind secularization, yet Stark and Finke (2000) compare this putative effect with a rather useless hotel elevator that goes down only. This comparison applies here, because the general trend is that GDP levels hardly decrease over time and therefore religiosity cannot increase. In contrast, social security spending increases and occasionally decreases over time and this could cause an increase in religiosity (De Graaf, 2013; Norris and Inglehart, 2004; Immerzeel and Van Tubergen, 2013). However, our study, questions the veracity of this social security explanation (see also Healy and Breen (2014) for an empirical refutation). Interestingly, during the current financial crisis GDP in some countries has actually declined and this reversal offers a unique natural experiment for future research to test the effect of GDP on religiosity. In this respect, the secularization

paradigm might also benefit from being brought together with aspects of the supply side approach (De Graaf, 2013; Stolz, 2006; 2009).

Our findings also raise a new and important question. Social security spending seems to be helpful in understanding between country differences in church attendance (the higher social security rates in a country, the lower average church attendance in that country, see Figure 3). However, within country variation in social security spending does not seem to affect church attendance (see Table 3 and Table 4, Model 2/3). The (bivariate) country between correlation was significant and in the expected negative direction, while the within correlation was significantly negative only in only 3 out of 9 countries and significant positive in 1 country (Ireland). These findings clearly are at odds with each other and the question is what this means for our understanding of the social security-church attendance link. Furthermore, average levels of education, urbanization, and GDP seem to be relevant for understanding between country differences in church attendance (see Table 4, Model 1), but only changes in GDP are capable of explaining within country change in church attendance in the fixed effects model (see Table 4, Model 2/3). Of course, GDP also correlates with other indicators as well, hence more tests are required.

It is important to recognize that scholars often draw conclusions based on between country effects/correlations implicitly assuming that country-specific unobserved variables are irrelevant. We have shown that this crucial assumption does not hold for an important test. Only in case of GDP we find congruence between conclusions from between country differences and conclusions based on within country differences. To adequately use the analytical models presented in this paper, data from as many countries on as many points in time (waves) as possible are to be preferred. As this type of data is scarce, it implies that we face a trade-off between the number of (comparable) countries and the number of waves. In various fields of research (e.g. religiosity, volunteering, citizenship, and ethnic discrimination) we see a pattern that hypotheses are predominantly tested with data from various countries where the number of waves are small and as a consequence grouped together to increase statistical power. The increasing number of comparable data probably will make it easier to estimate within country effects in the future. However, as long as the majority of comparisons are between nations, scholars should realize that their conclusions bear the danger of a fallacy. We recommend to at least include the unspecified country characteristics in a fixed effects model (see Table 4, Model 2 and 3). It would be even better to model between country effects on a third (country) level, and preferably include time (wave) as a control variable (Fairbrother, 2014; Schmidt-Catran and Fairbrother, forthcoming), to minimize the risk of jumping to false conclusions as this study has demonstrated.

Notes

1. To assume church attendance to be absent in non-affiliates seems realistic, yet we checked whether such data modification is warranted by doing all analyses in this article with the religious affiliated respondents only. It turned out that it did not change the estimates and figures importantly (results are available upon request). Only in Model 3 some changes occurred which are addressed in the text.
2. We first used an OLS regression with income as dependent variable. The predictor variables were: occupation of respondent (in 27 categories), occupation of head of household (29 categories), occupational status (9 categories), education (15 categories), age (ratio scaled), wave (ratio) and sex. We ran this model for every country separately. The explained variance was rather high: from 34% in Italy and Luxembourg to 58% in Denmark. Next, we replaced the missings on income with the use of these predictors, with the restriction that the imputed score must fall within the range of the original income variable (1-12). We used the multiple imputation module within the SPSS 22 package. The number of imputations was 5 for each missing score, imputation method: monotone. After imputation, the total number of valid observations for income is 187,389 (original 138,871).
3. The OLS equation: Average Church Attendance = $a + b_1 * \text{Social Security} + b_2 * \text{Denmark} + b_3 * \text{France} + b_4 * \text{Greece} + b_5 * \text{Ireland} + b_6 * \text{Italy} + b_7 * \text{Luxembourg} + b_8 * \text{the Netherlands} + e$. We used UK as reference category (indicator contrast). All unspecified country characteristics that may influence social security are represented by $a + b_2$ thru b_8 .
4. We also calculated within country effects of GDP (log) per country and found 6 significant negative effects, 1 non-significant effect (Luxembourg) and two significant positive effects (Greece and Italy). The effect of average educational attainment was somewhat less consistent (5 significant negative effect and 1 significant positive effect (Greece), and two non-significant effects (Italy, UK). The effect of average urbanization was as inconsistent as the social security effect (3 significant positive effects (France, Belgium, and UK) and 6 non-significant effects).
5. The between country effect was standardized by using the ratio between the standard deviation of social security (4.11) and the standard deviation of church attendance (.57), see Table 1. The unstandardized between effect (slope estimate) is $-.10$, so the standardized effect is $(4.11 / .57) * -.10 = -.72$.
6. To estimate the country specific effect of income we constructed nine income variables. For instance for Belgium we took the incomes of all Belgian respondents while respondents from all other countries received the mean income score in Belgium ($= 5.89$). This way, the regression slope for Belgium is not affected. The income effects shown in Table 4 are the sum of the main effect $b_1 * \text{income}$ and the interaction effect $b_x * \text{income} * \text{country } x$ from an OLS interaction model.

7. If social security has a negative effect [1] on church attendance after including time, and a (almost) zero effect with time excluded [2], then effect [1] is offset by a positive suppressor effect. This latter effect is only positive when time is positively related to church attendance [3], given the (empirical found and documented) positive relationship between time and social security [4]. In formula: $\text{negative effect [1]} + (\text{positive effect [3]} * \text{positive effect [4]}) \approx 0 (= \text{effect [2]})$. This scenario is unrealistic though, because effect [3] (time \rightarrow church attendance) is most likely negative in the nine European countries. At least on the bivariate level, the correlation between those two variables is found (very weak) negative (-.04) in our data set.

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