Church Attendance and Voluntary Engagement: The Anatomy of a Causal Mechanism

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— Preliminary Draft —

Abstract

This contribution examines the causal nexus between church attendance and voluntary engagement in a longitudinal perspective relying on panel data from the GSOEP. Recent years have seen an increased interest in the role of voluntary engagement for the workings of democracy and the social integration of modern societies. Furthermore, much research suggests that next to education, religious involvement is the most powerful predictor for active engagement in voluntary organizations on the individual level.

Although this finding is well established in the empirical literature, the exact causal relationship between religious involvement and voluntary engagement is far from clear. While theory suggests that people that attend religious services on a regular basis acquire important civic skills and are integrated in social networks that will eventually lead to voluntary work, the idea of a unidirectional causal link from religion to volunteering was not left without critics. For instance, the close connection between church attendance and voluntary work could also be due to a confounding third variable which leads to a mistaken causal relationship. In addition, a reciprocal relationship with voluntary involvement also leading to more religious involvement is another thinkable option.

Therefore, the aim of our paper is to empirically scrutinize the relationship between church attendance and voluntary work and resolve the debate on the causal mechanism by tackling different problems of endogeneity – unobserved heterogeneity, reversed causation and reciprocity. Information on volunteering and church attendance is provided in a total of 10 waves, allowing for a unique test of effect directions. Preliminary results show that – controlling for unobserved heterogeneity – there is indeed a link between individual church attendance and voluntary work that cannot be attributed to a third factor. In addition, we find a reciprocal relationship, but the effect of religious involvement on voluntary engagement is larger than vice versa.

Introduction

Recent years have seen an increased interest in the role of voluntary engagement for the workings of democracy and the social integration of modern societies. Furthermore, much research suggests that next to education, religious involvement is the most powerful predictor for active engagement in voluntary organizations on the individual level. Religious people simply are more active and civically engaged. Although this finding is well established in the empirical literature, the exact causal relationship between religious involvement and voluntary engagement is far from clear. While theory suggests that people that attend religious services on a regular basis acquire important civic skills and are integrated in social networks that will eventually lead to voluntary work, the idea of a unidirectional causal link from religion to volunteering was not left without critics.

In general two alternative specifications of the relationship are argued for. The first stresses the importance of confounding third factors which cause both, volunteering and attending religious services. When estimating the effect of attending religious service on volunteering, it is argued, the estimates are biased by unobserved heterogeneity. The second type of counter arguments does not deny the existence of the relationship but questions its direction. The correlation one can observe between attending religious service and Volunteering, it is argued here, is either due to a reversed causal process (i.e. from volunteering to attending religious services) or due to simultaneous effects in both directions.

Against this background, the aim of this paper is to empirically scrutinize the relationship between church attendance and voluntary work and to resolve this debate on the causal mechanism. Does church attendance indeed lead to voluntary engagement as much

of the literature suggests? Or is this relationship spurious, reciprocal, or even the other way around?

Although gaining in prominence in the social sciences, statements about causality derived from observational data (as opposed to experimental data) still is uncommon in the the field of social capital research (but see Brehm and Rahn, 1997; Claibourn and Martin, 2000; Freitag and Traunmüller, 2009; Paxton, 2002). One reason is that methods to solve the problem of causality have higher than usual requirements on the data (e.g. well behaved sets of instruments or panel data). Luckily, high quality panel data is available from the German Socio-Economic Panel, which allows us to address and study causal relationships. The GSOEP provides information on both religious indicators and civil engagement for a sufficient number of waves. To disentangle the causal mechanism behind the observable link we make use of the properties of two types of statistical models, namely fixed effects panel models and cross-lagged structural equation models.

The structure of the paper then is as follows. First, we lay out the theory. After presenting the counterarguments we then proceed with the description of our data. Next we introduce our models and provide empirical evidence for the idea that church attendance causes voluntary engagement. Last, we briefly summarize our main findings.

Theory

The widely accepted knowledge that religion and religious actors play a crucial role in civil society can be traced back to the days of de de Tocqueville ([1862] 1956). More recently, Putnam (2000, 66) noted that "nearly half of all associational memberships in America are church related, half of all personal philanthropy is religious in character, and half of all

volunteering occurs in a religious context." Indeed, the finding that religiosity and church attendance in particular is an important predictor for civic engagement and voluntary work is by now a well established fact in the literature (Bekkers, 2005; Borgonovi, 2008; Campbell and Yonish, 2003; Stolle and Hooghe, 2004).

This positive association between church attendance and volunteering is by no means restricted to the American case as studies for Germany show. For instance, in a recent study using GSOEP data, Traunmüller (2009) found that weekly church attendance boosts the probability to volunteer to 25 percent for Catholics (as compared to 19% for non-attenders), and a striking 59 percent for Protestants (as compared to 16 %) (see also Gensicke, Geiss and Picot, 2006; Von Rosenbladt, 2000).

The main theoretical argument for this relationship follows the ideas of Verba, Brady and Schlozman (1995) who state in their *Civic Voluntarism Model* that volunteering is explained by three factors: motivation, opportunity and resources. Belonging to a religious group and especially the active involvement in the religious community enhances these factors. Motivation arises from religious norms that encourage good deeds and caring for others. But religious communities also present opportunities for volunteering. Churches usually provide a wide scope of social, cultural, and educational services that require volunteers. These structures offer an easy way to participate and get involved in different fields and organizations. Concerning an individual's resources it is argued that active involvement in a religious community fosters the civic skills of its members, which in turn may be transferred to other spheres of civil society.

Although theory thus provides several paths in which an active religious life leads to volunteering and empirical findings also seem to point in this direction, the idea of a

causal link from religion volunteering was not left without critics. In fact, two alternative explanations for the empirical relationship are mentioned in literature: unobserved heterogeneity and reciprocal or reversed causality.

Addressing the first problem, Norris and Inglehart (2004, 194), for instance, argue that "people who are socially trusting 'joiners' [are] most likely to engage in civic activity and to belong to religious associations". Oesterle, Johnson and Mortimer (2004) also stress that the disposition to be socially active and to volunteer is set up early stages of the life course and does not change later on. These unobserved third factors pose a problem if they cause both volunteering and church attendance since omitting them will yield biased estimates of the church attendance-volunteering-nexus.

Concerning the second problem, Norris and Inglehart (2004, 192), further argue that while "people [...] in churchrelated organizations [...] learn to become more engaged in the social concerns [...] the reverse causal process could equally well be at work". Indeed, McIntosh, Sykes and Kubena (2002) as well as Stark and Finke (2000, 118) explain church attendance through the structure and influence of one's social networks and thus reverse the causal arrow.

Clearly, these different theoretical accounts of the linkage between church attendance and volunteering needs further empirical investigation.

If these critical voices are to be rejected, we should be able to observe two things: (1) When controlling for unobserved heterogeneity, the effect of church attendance on volunteering should not vanish. (2) When estimating a model that allows effects to go simultaneously in both directions, there should be no effect in the direction from volunteering to attending religious services. In order to test these assumptions, we will

make use of the properties of fixed effects models and cross-lagged structural equation models, respectively.

FIGURE 1: Alternative Explanations for the Relationship Between Church Attendance and Volunteering

Direct Effect

Unobserved Heterogeneity

Reciprocity and Reversed Causation
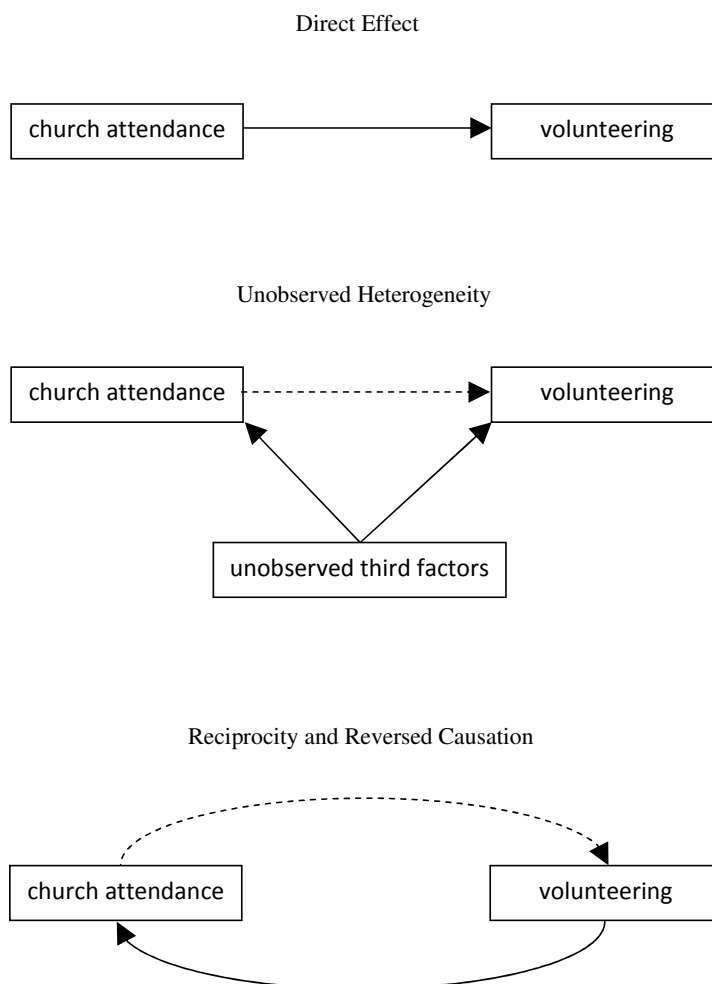
Data

To shed light on the causal relationship between church attendance and voluntary engagement we rely on the high quality panel data of the German Socio-Economic Panel (GSOEP). Information on volunteering was first collected in 1985, information on attending religious services since 1990. Information on volunteering and church attendance at the same time is provided in 10 of the GSOEPS's waves (see table 1).

TABLE 1: Waves of the GSOEP – Availibility of Key Variables

Year	Volunteering	Church Attendance
1985	x	
1986	x	
1987		
1988	x	
1989		
1990	x	x
1991		
1992	x	x
1993		
1994	x	x
1995	x	x
1996	x	x
1997	x	
1998	x	x
1999	x	x
2000		
2001	x	x
2002		
2003	x	x
2004		
2005	x	x

Data source: GSOEP

Volunteering is understood as doing voluntary unpaid work in associations, clubs, and organization on a regular basis. Religion as the explanatory factor is conceived of as a

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[1]More than 5000 respondents answered the questions on our key variables for all 10 waves. Per wave the number of respondents having answered both key variables fluctuates between 13,174 and 22,033 respondents. Our dataset consists of the following sub-samples: "Germans-West" (A), "Foreigners-West" (B) , "SOEP-East" (C), "Migrants" (D), "Refreshment" (E), "Innovation" (F).

person's involvement in a religious community. It is assumed that the regular attendance at religious services serves as a good proxy. Volunteering and attending religious service in the GSOEP are measured by the following question:

> *"Which of the following activities do you take part in during*
> *your free time? Please check off how often you do each activity:*
> *at least once a week, at least once a month, less often, never."*

> *"Volunteer work in clubs or social services"*

> *"Attending church, religious events."*

We choose to recode these key variables into dichotomies: '1' then denotes church attendance and volunteering on a regular base - once a month or more often - and '0' less than once a month. As a result both variables have straight forward interpretations[2].

To rule out the possibility of a spurious relationship and to decide on the direction of effects we choose fixed effects models and crossed-lagged structural equation models in order to control for unobserved heterogeneity and to estimate reciprocal relationships. Both models need at least two panel waves for estimation but will produce more reliable results if more time points are available. Fixed effects estimates are enhanced due to more precise estimates and and in our cross-lagged structural equation models every further wave adds one additional estimate of the relationship we are interested in. First we will discuss the fixed effects models' properties and respective results and then present the specification of the cross-lagged structural equation model in a second step.

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[2]In general ordered logit models are more accurate in dealing with categorical variables and therefore should be the first choice for estimating the effects. However, some problems arise from this estimation procedure. In ordered logit models new metrics are estimated for the dependent variable in respect to the probabilities to fall in one of the categories. However, we want to compare effect sizes and therefore need a reliable, non-changing scale.

Analysis I: Testing for Unobserved Heterogeneity

Fixed effects models are an elegant way to get rid of a considerable amount of time invariant and possibly biasing unobserved heterogeneity (Finkel, 2008; Greenberg, 2008; Halaby, 2004; Menard, 2002). They thus allow us to test whether the relation between church attendance and volunteering can be attributed to a third factors confounding the relationship. By subtracting out all information which is not changing over time, unobserved third factors drop out of the estimation and are no sources of bias anymore. A fixed effect model may be formally expressed as:
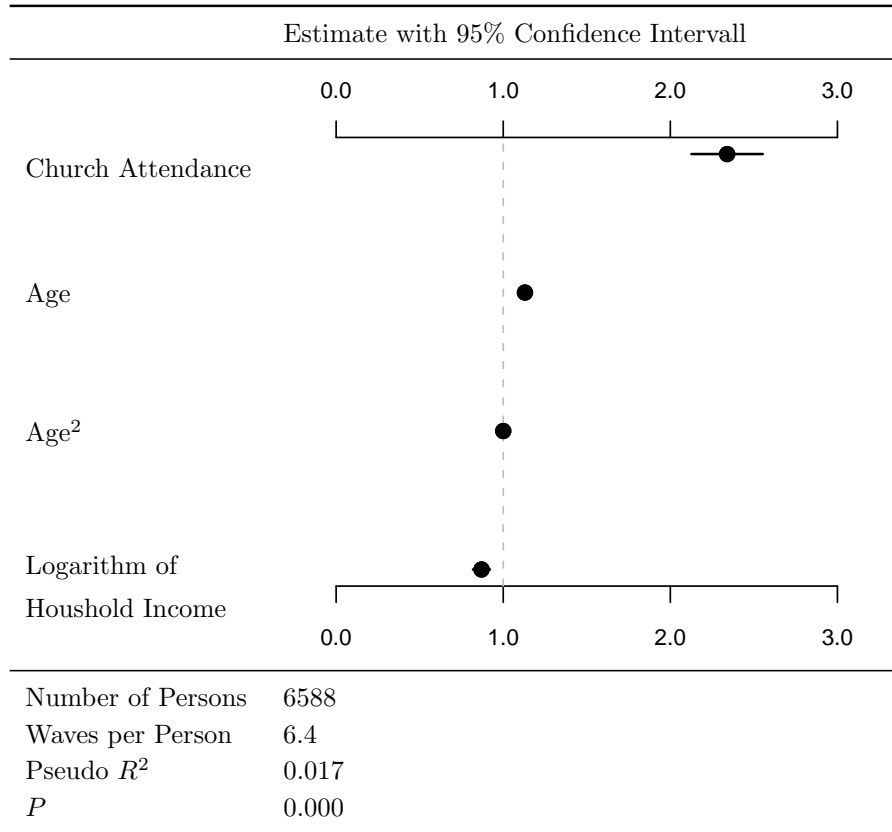
$$(Y_{it} - \overline{Y}_i) = \beta_1(X_{1it} - \overline{X}_{1i}) + \beta_2(X_{2it} - \overline{X}_{2i}) + \cdots + \beta_j(X_{jit} - \overline{X}_{ji}) + (\epsilon_{it} - \overline{\epsilon}_i) + (u_i - \overline{u}_i) \ .$$

Where Y is the dependent variable and X the independent variables. ϵ_{it} and u_i are error terms with the first being unit and time specific and the latter only unit specific and constant over time. $\overline{Y}_i, \overline{X}_i, \overline{\epsilon}_i$ and $\overline{u}_i$ are the unit specific means of Y, X, ϵ and u, for all time points t. Respectively the unit specific error term drops out because u_i is constant over time so that $u_i = \overline{u}_i$ and $u_i - \overline{u}_i = 0$. The same is true for all X_n that are constant over time.

Table 2 presents the results of the fixed effects model. Although we controlled for all time invariant as well as two time variant factors (age and income) here, church attendance has a highly significant effect. Speaking in terms of substantial effect sizes, people who attend church on a regular basis have a more than doubled probability to do voluntary work than the religiously uninvolved[3]. Comparing the fixed effects estimates to ordinary

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[3]Starting with a probability of 12% to do voluntary work – the mean of all non church attenders in the sample – than an effect of 2.343 (as odds ratio) would mean that we predict a probability of 24.21% for an religiously involved person.

TABLE 2: The Effect of Church Attendance on Volunteering (Fixed Effect Model)

	Estimate with 95% Confidence Intervall			
	0.0	1.0	2.0	3.0

Number of Persons	6588	
Waves per Person	6.4	
Pseudo R^2	0.017	
P	0.000	

Odds ratios reported.

cross-sectional estimates (not shown here) the effect's size is only half the cross-sectional one. This indicates that estimates from cross-sectional analyses are indeed upward biased by confounding third factors. More importantly, however, the fixed effects model provides us with evidence that the relationship usually found in cross sectional data is not spurious: Church attendance is indeed strongly and positively related to volunteering.

While fixed effects models do a good job in controlling for time invariant unobserved heterogeneity and therefore yield more reliable estimates than cross-sectional models, they cannot cope with reciprocity. The problem with reciprocity is that it leads to a violation of the assumption that independent variables and error term are uncorrelated. Estimating a reciprocal relationship with standard regression models would produce estimates which are biased because they estimate both - the effect of X on Y and the effect of Y on X

at the same time. We therefore turn to a different analytical strategy, i.e. Cross-Lagged Structural Equation Modelling.

Analysis II: Testing for Reverse and Reciprocal Causation

The second type of model we estimate is a cross-lagged structural equation model which allows us to establish the direction of the effects – from attending religious services to voluntary engagement and/or the other way around (Finkel, 1995). A cross-lagged structural equation model may be formally expressed as:

$$Y_t = \alpha_1 + \beta_1 Y_{t-1} + \beta_2 X_{t-1} + \epsilon_1$$

$$X_t = \alpha_2 + \beta_3 X_{t-1} + \beta_4 Y_{t-1} + \epsilon_2$$

Where Y_t and X_t are both dependent variables, α_1 and α_2 are the regression intercepts and the ϵ_1 and ϵ_2 are error terms, $\beta_1 Y_{t-1}$ and $\beta_3 X_{t-1}$ are controls for previous values while β_2 and β_4 are the actual cross-lagged effects, respectively. Because Y_t cannot have an effect on X_{t-1}, X_{t-1} should then be uncorrelated with the error term which solves the problem of estimating reciprocity.

Because the processes of volunteering and church attendance have certain properties which are not considered in Finkel's standard model we have to add some modifications. We introduce the three components of our modified model step by step. The first two components – the stability and regression to the mean parts – serve as a baseline for comparison while the cross-lagged part models the effects we are actually interested in (see figure 2).

FIGURE 2: Components of the Cross-Lagged Structural Equation Model
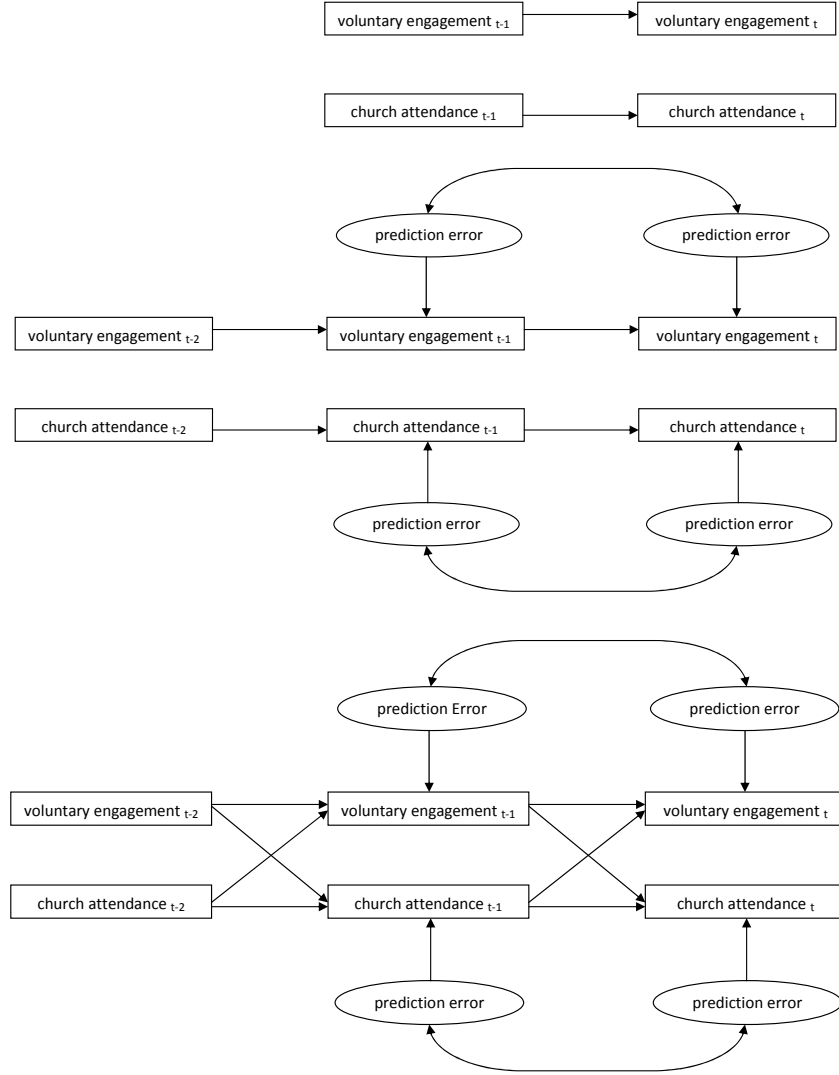
The first component of the model captures stability of our key variables across waves. Both variables are quite sticky and change does not happen too often. Correlations from one wave two another lie between .56 and .67 for volunteering and between .72 and .79 for church attendance. Therefore an accurate model has to capture these stabilities. Because stability means no change, the coefficient should be close to 1. In other words people who did not volunteer at time $t-1$ are likely not to do so at time t either, while people who volunteered are likely to also volunteer at later points of time (therefore $Y_t = 1 \cdot Y_{t-1}$). Besides modelling stability, the first component of the model also serves as a control for

unobserved time invariant third factors. If time invariant third factors exist they should be part of Y_t and Y_{t-1} so that the lagged variable Y_{t-1} explains all the variation of Y_t which is due to time invariant factors.

Up to now we only modelled stability, but changes from wave to wave do occur. This change over time can be split in two parts. The first refers to change that is of no substantial interest to us since it incorporates change caused by unobserved time variant third factors, measurement error, and real regression to the mean effects (see Finkel, 1995, for a discussion). All these factors lead to a negative correlation of Y_t and Y_{t-1} and therefore downward bias the stability estimator. Furthermore, in the case of binary variables every change in Y adds to the negative correlation by necessity. To control for all the usual change we find in our data, we estimate the regression to the mean effect by allowing the errors of Y to correlate (see the panel in the middle of figure 2).

The last component of our model introduces the so called cross-lagged effects. Here we finally model the relationship we are actually interested in, i.e. effects from attending church to volunteering and vice versa. As mentioned before lagged values of the independent variables are used to make sure that Y_t's error term is uncorrelated with that of the independent variable (see the panel at the bottom of figure 2).

Figure 3 presents the structure of our structural equation model while table 3 presents the most important model fit indicators. Let us first consider the model fit of different specifications. We estimated a total of four models with constrained parameters and compare their model fit statistics. The first constrained model sets all cross-lagged effects to zero, while the other two models constrain either church attendance's effect or voluntary work's effect to be zero. Because setting all cross-lagged effects to zero doubles the χ^2-

|	No Cross-Lagged Effects	Volunteering Coefficients = 0	Church Att. Coefficients = 0	Full Cross-Lagged Model
df	155	146	146	137
χ^2	2057	1221	1637	1052
$\Delta \chi^2$	1055	169	585	0
χ^2/df	13.27	8.37	11.21	7.68
CFI	.988	.993	.991	.994
RMSEA	.0191	.0148	.0174	.0141
Hoelter .05	3027	4826	3600	5288

statistics we can conclude that both cross-lagged effects seem to be essential parts to replicate the empirically found covariance structure. But which of the effects is more relevant? While constraining volunteering's effect to zero increases the χ^2-value by 169 points, constraining the ones for church attendance provides us with a statistic that is 585 points larger than that of the basic model. In other words, assuming that the effect of church attendance is zero results in a much worse model fit.

All in all, the model fit statistics attest the fully cross-lagged model the best fit. Although the χ^2-statistics is high – 1052 with 137 degrees of freedom – those numbers are not surprising due to the large number of observations. Further measures like the CFI, RMSEA and the Hoelter criterion attest our model an excellent fit. The Hoelter criterion, for instance, states That, had we used only 5288 individuals for the estimation, the χ^2 statistics would have been small enough to be accepted at a significance level of .05 (see table 3).

A problem related to our cross-lagged structural equation model is the determination of the adequate lag-structure. In our model we use all waves which leads to lags of one or two years between independent and dependent variable. This is however not a big

TABLE 4: SEM – Estimates

Year	Estimates with 95% Confidence Interval
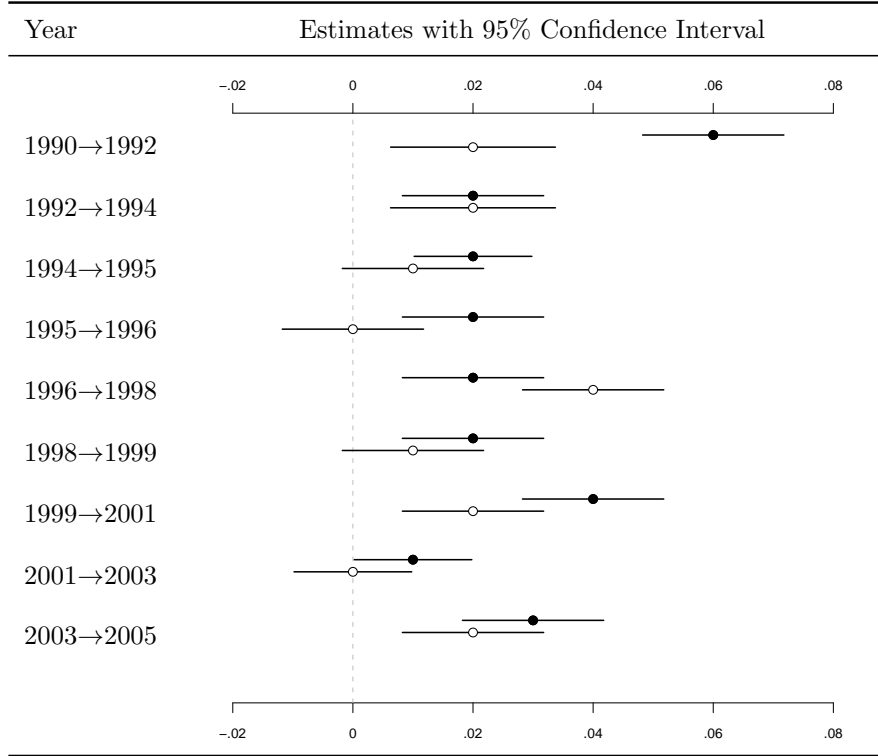
Black dots represent estimates for the effect of church attendance while white dots represent volunteering's effect.

problem. First, we have no theoretical guidance for how long it takes for the effects to manifest - so varying the intervals seems a good idea. Second, we want to have a general test of our hypothesis and prefer to have more estimates instead of less. Most importantly, however, we are mainly concerned with the comparison between the effects of different directions and thus are more concerned with the symmetry of the lags than with their actual duration.

Regarding the estimates one can see that they are quite small. This results from the fact that we control for the previous wave's value as well as for the regression to the mean mechanism. Therefore the variance left to be explained is very small and so are the estimated effects. This is the price for a reliable comparison of effect sizes. However, the

effect sizes become more substantial when we start to interpret them.

The interpretation of those cross-lagged effect estimates is not trivial. Let us recapitulate: The key effects we are estimating are the effects of previous explanatory variables on the dependent one – controlled by stability and the usual change. Because stability is controlled for, the estimate gives us information about whether or not people are changing from one wave to another due to changes in the explanatory variable – in addition to ordinary change. Let us give an example: We estimated an effect of $\hat{\beta} = .02$ for the effect of church attendance in 1994 on volunteering 1995. This means than that the expected probability to volunteer is 2% higher for those who started to regularly attend religious service compared to their previous probability – controlled for change that occurs for other reasons. Considering our hypothesis we can conclude that in seven out of ten instances, coefficients are larger for the church attendance effect than for the voluntary work effect. Only in two instances they are clearly smaller (see table 4). Thus, while we find some evidence for a reciprocal relationship, the effect of church attendance on voluntary work is somewhat stronger than the other way around.

FIGURE 3: Full Cross-Lagged Structural Equation Estimates
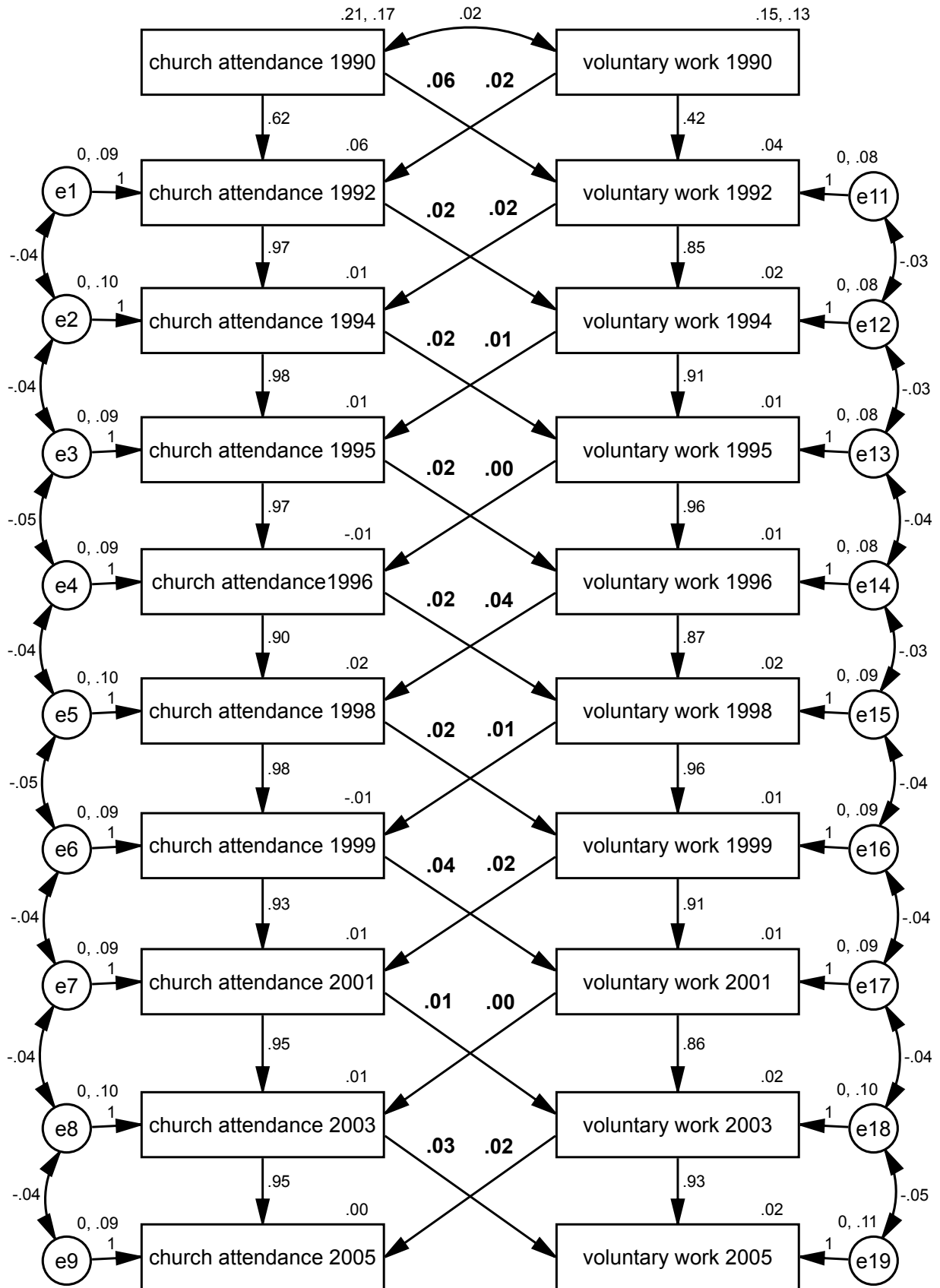
Conclusion

The aim of our analysis was to shed light on the causal mechanism between attending religious services and voluntary work. Although there are good theoretical reasons why attending religious service should lead to voluntary work, there exist two alternative explanations for this link. First, the relation may be spurious, caused by unobserved heterogeneity. Second, that the relation may be reciprocal or reversed. By using fixed effects models to sort out unobserved heterogeneity and structural equation models to simultaneously estimate effects in both directions we could resolve this causal puzzle. First, the relationship is robust controlling for unobserved heterogeneity. Second, the relationship is reciprocal but church attendance shows a higher effect on volunteering than vice versa.

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