

## Comparing religiosity cross-nationally: about invariance and the role of denomination

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## **Comparing Religiosity Cross-nationally**

### ***- About Invariance and the Role of Denomination***

#### **Abstract**

For quite some time there has been widespread consensus in the social sciences that religiosity is a multidimensional and multifaceted phenomenon (see for example Glock 1962; Storm 2009). Individuals may be very religious with respect to one dimension and less so towards another. Previous research has identified various typologies, also called religious profiles, showing different combinations of religious multidimensionality within and across countries. This paper identifies dominant cross-national profiles of religiosity and (1) examines whether there is one valid typology worldwide, or if some countries show profiles more similar to one another than to others; (2) tests the results for invariance to examine whether it is actually appropriate to compare the empirically found typologies of religiosity cross-nationally and (3) looks at the impact of denomination for profile formation. The results reveal that (1) there is a valid typology worldwide, but instead of showing specific characteristics, profiles can be ordered on a single latent continuum from low to high levels of religiosity. (2) It is almost impossible to establish full invariance across countries with a comprehensive set of variables measuring religiosity, but partial homogeneity can be achieved. Contrary to all theoretical expectations, the analyses imply (3) that denomination is not a crucial impact factor for religious profile formation.

**Keywords:** religiosity, LCA, invariance



## **1. Introduction**

Even if God was already declared dead by 19<sup>th</sup> century European philosophers, ongoing global debates on secularization and recent religion-based conflicts suggest that studies on religion will only gain in importance in the foreseeable future. Knowledge about the nature of individual religiosity enables examinations of increases and declines in religiosity in societies as it sheds light on mechanisms that might trigger conflicts.

Empirical research has shown that religiosity is a multifaceted phenomenon (Glock 1962; Cornwall et al. 1986; King and Hunt 1975; Storm 2009; Pearce and Denton 2011; Pearce, Hardie and Foster 2013). Factors such as belief, emotional connection to God, spirituality, religious behavior, or institutional affiliation account for different dimensions of religiosity. People might be highly religious along certain dimensions and less religious along others. Against this backdrop some argue that religiosity can only be satisfactorily captured by typological measurement approaches, since individual combinations of religious dimensions lead to individual profiles of religiosity (see for example Storm 2009, Pearce, Hardie and Foster 2013). The typological approaches of previous research enabled the discovery of some very specific profiles of religiosity. However, comparative research has since shown that these observable dominant religious profiles are not necessarily the same across countries (see for example Davie 1994; 2000; Storm 2009 or Voas 2009).

For meaningful comparisons data must be truly comparable, therefore, it is necessary to test data for measurement invariance (see Vandenberg and Lance 2000; Meuleman and Billiet 2012; Davidov et al. 2014; to mention but a few). Invariance tests are particularly important for cross-national data, since respondents have been socialized in different cultural contexts, live in different economic circumstances and speak different languages - all factors that might



lead to dissimilar and varied understandings of survey questions and related concepts and thereby compromise data comparability across countries.<sup>1</sup>

However, in the case of religiosity there may be a second element causing structural differences in the data. As religious doctrines play a crucial role in shaping religious beliefs and behavior (Halman and Draulans 2004, McQuillian and Gehrmann 2017), both country-specific differences and individual religious affiliation, i.e. the religion or denomination the individual affiliates with (or the lack of any religious affiliation) can be assumed to affect religious profile development.

This paper examines cross-national profiles of religiosity from a methodological and substantial angle, beginning with an analysis of whether there is one valid typology worldwide, or if some countries show profiles more similar to one another than to others. Then, it tests the results for invariance in an effort to examine whether it is actually appropriate to compare the empirically found typologies of religiosity cross-nationally. Finally, it looks at the impact of respondents' denomination as a distinguishing element for profile development. The data basis for this endeavor is the ISSP (*International Social Survey Programme*) of 2008, which provides a wide range of variables on religious beliefs, attitudes and behavior for a total of forty-four countries worldwide.

The next section summarizes the main arguments for using typological measurement approaches to measure religiosity and introduces some relevant profiles of religiosity discovered by previous research. This section is followed by theoretical considerations on what kind of influence religions or denomination, respectively, might have for profiles of individual religiosity. Section 4 outlines the central research questions and hypotheses, while

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<sup>1</sup> Another question in this context, which is not the focus here, is whether survey instruments are translated accurately so as to be understood equally by respondents within and across countries. This kind of measurement error is in principle always possible, however, not too likely due to the high standard of the ISSP translation procedures.



section 5 describes the data basis, variables and methods used, followed by results and discussion. The final section concludes the paper with a summary of the main results and their implications for further research.

## **2. Profiles of religiosity**

An established procedure for measuring religiosity in and across societies is the utilization of a typological approach examining the nature of individual religiosity which is then cumulated on a society level (see for example Chaves 2010, Davie 1990, 1994 and 2000; Edlund 2013; Jones et al. 2011; Pearce and Denton 2011; Stolz et al. 2014; Voas 2009). This approach is based on the idea that religiosity is a multidimensional phenomenon characterized by multiple factors such as belief, emotional connection to God, spirituality, religious behavior, or institutional affiliation. Unlike continuous measures<sup>2</sup> that take only one specific value indicating an individual's degree of religiosity within a range, typological measures grant all factors the right of a parallel existence and thereby indicate individual religious profiles. A score along a continuous religiosity measure cannot reveal which factors are actually crucial for achieving this score. They merely indicate a certain degree of religiosity, but variations in religiosity, so it is argued, are often differences in pattern rather than degree (Storm 2009, 716) and patterns only appear due to typological measures.

Different dominant profiles of religiosity<sup>3</sup> have been identified across societies by various studies: Edlund (2013) uses ISSP data across twenty-nine countries and three different points of time between 1991 and 2008. His analyses reveal a typology of *Traditional Believers*, *two different types of Alternative Believers* and *Non-Believers* – a set of profiles that can be found across countries and time. However, due to the article's approach, this is based on a rather

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<sup>2</sup> Continuous measures can be, for example, factor scores resulting from a Confirmatory Factor Analysis.

<sup>3</sup> The procedure to identify profiles of religiosity is explained in detail in the methods section.



limited number of just three items measuring religious belief. Stolz et al. (2014) also developed a typology on the basis of ISSP data. The national Swiss study identifies typologies on two different levels of detail along the axes of institutional religiosity and alternative spirituality. The broader classification comprises an *institutional type*, a *reserved type*, a *secular type* and an *alternative type*.<sup>4</sup> By means of national data, Pearce and Denton (2011) identify five common profiles of religiosity among adolescents in the United States; labeling these the “Five A’s”: *Abiders*, *Adapters*, *Assenters*, *Avoiders* and *Atheists*. *Abiders* display high levels of religiosity, while *Atheists* score very low on all measures of religiosity. The three other groups are located between these extremes, each showing certain specific profiles of religiosity. Jones et al. (2011) look at the impact of gender and ethnicity on religious profiles among young adults participating in two waves of an US-American longitudinal survey. Next to the obligatory extreme groups of *generally low* and *generally high* religiosity, on the basis of the included items they differentiate between a *personal experiential* group, a *personal ritual* group, an *involved* group and a *spiritual-not-religious* group. Voas examines religious change in twenty European countries utilizing ESS (*European Social Survey*) data. His findings are not that different: Next to one quite consequently *religious* and one *non-religious* group, he discovers a large group of people situated between these two extremes. Instead of differentiating specific profiles among those neither holy religious, nor non-religious, however, he speaks of one group showing “Fuzzy Fidelity” (Voas 2009). Others have also focused on these “fuzzy groups” which exist between the religious and the non-religious. Davie (1990; 1994; 2000) identifies persons classifiable as *Believing without belonging* in Great Britain as well as groups of those *Belonging without believing* predominantly in Scandinavian countries. Storm (2009) examines data across ten European countries and identifies Davie’s *Believers without belonging*, those *Belonging without*

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<sup>4</sup> Translation from German by the author



*believing* as well as four “fuzzy” groups. Siegers (2012) examines the nature and distribution of alternative spiritualities in Europe. Using data from the EVS (*European Values Study*) his analyses reveal six classes of religious orientations across twenty-seven European countries: *atheism, religious indifference, moderate religiosity, individualistic religiosity, church religiosity* and *alternative spiritualities*<sup>5</sup>.

With the exception of Siegers, none of these studies systematically tested the latent classes nor the items involved for invariance across groups, leading to the question as to whether the meaning of the latent classes is actually comparable across countries. After a section theoretically exploring the question of what sort of impact belonging to certain religions/denominations might play in individual religious profile formation, this paper then follows the typological measurement approach for the identification of cross-national religious profiles and tests for invariance.

### **3. Religion and denomination**

Religions or denominations<sup>6</sup> provide their followers with an ideology and a code of behavior, more or less strictly formulated depending on the nature of denomination and the level of secularization within the country. The following explores religious attitudes and behavior theoretically expected of various religious groups:

Particularly in Northern and Western Europe those who consider themselves as *not belonging to any denomination* are an already large and steadily growing group. Although parts of this group might have been socialized in a religious context and are more or less affected by the influence of societies’ dominant denominations, of all respondents they are expected to show

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<sup>5</sup> Translation from German by the author

<sup>6</sup> Due to the data basis this paper differentiates between followers of main religions, in the cases of Jews and Muslims. In the case of Christians, it further differentiates between the denominations: Roman Catholicism, Protestantism and the Orthodox Church. To save space, from now on the term denomination will be used to refer to these Christian denominations as well as the main religions.



the lowest levels of religiosity across all dimensions. An exception could be a group of *Believers without Belonging* as observed by Davie (1990). Such a group would form a cluster with low levels of institutional religiosity, but with quite strong belief in God and other sacred matters.

*Catholics* are generally presumed to be more religious than *Protestants* since the secularization process has affected the major Protestant Churches more strongly than the Catholic Church (Therborn 1995, 274). Especially in terms of institutionalized, church-related behavior, Protestants are generally presumed to show lower levels of commitment. The roots lie in the theological foundations of denominations themselves. Individualism receives greater emphasis in Protestantism, since emphasis on the role of the Church as mediator between the believer and God is reduced (Halman and Draulans 2004, 286). Protestants, however, less institutionally involved, might stress their sense of spirituality more than Catholics do.

Theologically, *Orthodoxy* also stresses the community idea, however, unlike in Catholicism, not in a centralistic way “from above”, but more in an emancipated manner as “the Church as a whole” (Halman and Draulans 2004, 266). The Orthodox Church puts specific emphasis on ceremonial religious rituals at religious holidays, which creates a number of “occasional church goers” in Orthodox societies (Höllinger 2013, 55). Apart from the theological foundations, one cannot ignore the influence that suppression by the Soviet regime had on the Orthodox Church in affected countries, which is most likely the reason for the rather high level of secularization (Halman and Draulans 2004, 266).

*Jewish* tradition in general is focused much more on religious practice than on religious belief (Cohen, Siegel and Rozin 2002). In a series of studies Cohen et al. (2002) have shown how also Jewish participants’ self-rated religiosity is predicted by their extent of practice but not by knowledge of Judaism or religious beliefs. The reason for this may be that the level of attention Jews give to individuals’ mental states is lower compared to other religions (Cohen,



Siegel and Rozin 2002). While, for example, Protestants' individual beliefs conceptualize a person's religion, Judaism is passed on via the mother, independently from the individual's connection with God. Or, while for a Protestant having thoughts about immoral actions already means having done something wrong, for Jews, such thoughts are morally neutral (Cohen and Rozin 2001).

Formulating expectations for a Muslim typology of religious attitudes and behavior is more complicated, since to date, this remains less widely examined. However, given that for Muslims being faithful is self-evident (Pace 1998, El-Menouar 2014, 56), high levels of religiosity are expected to be observed on all belief questions. "Church" (or rather mosque) attendance could be comparably low, first, because it is mostly just men who attend, and second, even for men mosque attendance is not an inherent part of Muslim piety as such and therefore, not compulsory (El-Menouar 2014, 55).<sup>7</sup>

#### **4. Hypotheses**

This paper aims to develop a cross-national typology of religious profiles including thirty-five countries across the world that produces results which pass an invariance test. The database comprises some very dissimilar countries. Dissimilarity in this context refers to the languages spoken, the denominational structure, the economic and political situation, recent history, as well as the Church-State relationship, just to mention a few factors. Finding dominant profiles of religiosity that will be valid across a large number of these partly very dissimilar countries, therefore, seems challenging at best. Consequently, the central hypothesis is:

*H1a: It is not possible to conduct a valid typology for religiosity including thirty-five countries.*

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<sup>7</sup> The implications of this issue for the comparability of the measurement instruments are further discussed in section 5.



Some countries, however, appear more similar to each other than others. The level of similarity probably increases, if the whole set of countries is broken down into smaller groups.

*H1b: The smaller the groups of countries and the more similar the countries contained in these groups, the more invariant the data becomes.*

Denominations provide their followers with an ideology and a code of behavior. It is therefore assumed that members of certain denominations are clustered by certain religious profiles reflecting the characteristics of these ideologies and behaviors. Based on the theoretical expectations explored in section 3 the following hypotheses on the specific denominations will be tested:

*H2) Those, who do not belong to any denomination show a profile with a low general degree of religiosity across all religious dimensions.*

*H3) Catholics show a profile with generally high degrees of religiosity across all religious dimensions.*

*H4) Protestants show a profile that emphasizes belief and spirituality more than institutional commitment.*

Hypotheses for Orthodoxy are twofold. Based on religious doctrine, a profile uniting Orthodox Christians could be characterized by rather high church attendance in relation to comparably low levels of belief:

*H5a) Orthodox Christians show a profile that emphasizes church attendance more than belief and spirituality.*

However, the Socialistic history of Orthodox countries might have caused a general decrease in religiosity that includes church attendance. The second hypothesis therefore is:



*H5b) Orthodox Christians show a profile of comparably low levels of religiosity across all religious dimensions.*

*H6) Jews show a profile that emphasizes institutional commitment more than belief and spirituality.*

*H7) Moslems show a profile with a generally high degree of religiosity, except for church attendance.*

## **5. Data, variable selection, and methods**

### *Data source*

The data used for this study are taken from the ISSP 2008 *Religion III* module (ISSP Research Group 2012) and a cumulated data set containing data from four non-ISSP-member countries (ISSP Research Group 2013) where the Religion survey was conducted in the context of the *Religion Around the World Study* of the 2008 International Social Survey Programme. Together these datasets provide national data from forty-four countries across six continents, thirty-five of these are included in the following analyses.<sup>8</sup>

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<sup>8</sup> For the full list of countries and sample sizes see Table A1 in the appendix. Data from the Netherlands and Russia are excluded due to data inconsistencies. South Africa, Switzerland, Spain and Northern Ireland are excluded, because of filter errors.

The four Asian countries Japan, South Korea, Taiwan and Sri Lanka are excluded for comparability reasons (see further explanation in the section *Variables*). For Belgium only the regional subsample of Flanders is available.



## *Variables*

The item selection orients on the choices made by Pearce, Hardie and Foster (2013) who conducted an LCA using a wide range of items to identify profiles of religiosity in a US-American national sample. Their choice of items was based on a tri-dimensional religiosity classification scheme<sup>9</sup>: cognitive, affective and behavioral (Cornwall et al. 1986 in Pearce, Hardie and Foster 2013, 62); addressing three general components: religious belief, commitment and behavior. This study covers the same dimensions with similar items<sup>10</sup>, offering a rich basis of religious aspects upon which to build typologies.

The cognitive dimension of religiosity is reflected through belief or, conversely, doubts in the existence of God and/or other elements of religion (Pearce, Hardie and Foster 2013, 58). Variables included in this study measure cognitive aspects of religiosity by asking about the extent to which respondents believe in God; if they regard God to be a personal God or, more transcendent as a Higher Power of some kind. Respondents can also express a more agnostic view, stating they do not know whether there is a God, and not believing there is any way to find out. Another item covers the issue of whether respondents believe God to be concerned with humans. The third measure asks about belief in life after death.

The affective dimension of religiosity captures the emotional connection between an individual and sacred or religious matters (Pearce, Hardie and Foster 2013, 58). One question included for this dimension asks whether life is meaningful because God exists. Other items deal with spirituality, asking the respondents whether they perceive themselves as religious and/or being spiritual, interested in the sacred or the supernatural and thereby differentiate

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<sup>9</sup> The purpose of this paper is to a large degree methodological; therefore instead of discussing the single dimensions in great detail, this paper takes on existing interpretations and realizes them with similar items. For a thorough discussion of religious dimensions see for example Glock 1962 and Cornwall et al. 1986. For the variable choice of their measurement see Pearce, Hardie and Foster 2013.

<sup>10</sup> Full documentation of the question texts is available at <http://zacat.gesis.org/webview/index.jsp?object=http://zacat.gesis.org/obj/fStudy/ZA4950>.



between organized church religiosity and a personal connection with the divine. Because of its big explanation potential, the variable is included although there is some indication that the cross-national interpretation of “spirituality” could be difficult (Siegers 2013, 180).

Religious behavior is addressed by the classic question on public religious practice: frequency of church attendance; and one question on private religious practice: frequency of praying.

In addition to the very substantial aspects of religiosity listed above, a central aspect of this paper is the role a person’s denomination plays for individual religiosity profiles. The variable covers seven groups: 1. those reporting to have no religion, 2. Roman Catholics, 3. Protestants, 4. Orthodox Christians, 5. other Christian religions, 6. Jews and 7. Muslims.<sup>11</sup>

Almost all variables used for the measurement of religiosity assume the core element of a monotheistic God. For the measurement of religious behavior, some kind of house of worship where sermons (in some form) are offered to the public at least on a weekly basis is essential. Since this is not necessarily the case in Asian religions, such as Buddhism and Hinduism, the countries where these are the (pre-)dominant denominations, Sri Lanka, Japan, Taiwan and South Korea<sup>12</sup> are excluded from the analyses. Similarly, all Buddhists, Hindus and followers of “other Eastern Religions” in the remaining countries, are equally excluded from the analysis. For all countries the design weight is applied, if provided in the data. A population weight for Germany ensures the correct relation between East and West.<sup>13</sup>

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<sup>11</sup> Due to the denominational composition of the countries, the broad categories do not necessarily contain the very same denominations in every country. E.g. the category “Protestants” might cover predominantly mainline Lutheran Protestants in one country and mainline Calvinists in others, whereas in all countries also the rather extreme Protestant Free Churches are also covered by this category. For the national-specific composition of the category “Protestants”, see the national ISSP Variables “nat\_Relig” on ZACAT (<http://zacat.gesis.org>).

<sup>12</sup> South Korea is a border case here. There are more Christians in South Korea than in the other excluded countries. However, of all religious South Koreans in the sample, 42% do not follow a monotheistic religion. 40% of the whole South Korean sample is non-religious. Since a great number of those have been socialized rather in non-Christian than in a Christian context, South Korea does not meet the selection criteria.

<sup>13</sup> Germany is treated as one unit, although it is well known that East and West Germany vary greatly in religious matters. Nevertheless, the country has been united for 25 years now. It shows cultural facets that might have their origins in different regional history, just as other countries do.



Of course, it could be questioned how well some of the measures used can possibly work in the remaining countries in terms of their cultural context or dominant religion, e.g. how well the measurement instruments, designed to measure religiosity in Christian societies, translate into the terminology of other religions, such as Islam and Judaism. A primary example for this possible misalignment is the “church attendance” measure when applied to Islamic societies. Since women rarely attend mosque in the majority of Islamic societies, they consequently answer negatively to questions on church attendance. As a result there is the risk they will be perceived as being significantly less religious than they actually are. In the Turkish ISSP survey, the only homogeneous Islamic society included in the ISSP, instead of asking about Mosque attendance, attendance, the *Salah* (5x daily prayer ritual) was queried, which can be performed by both men and women. Whether this concept is truly functionally equivalent and whether the answer scales are then comparable with “church attendance” is debatable. Nevertheless, the item manages to capture religious behavior for women, even if there is some overlap with the question on the frequency of prayer. Despite, or even because of the reasonable suspicions that Christian measurement instruments cannot easily be applied to Muslim or Jewish religiosity, a decision was made to keep Turkey and Israel and the cases of Moslems and Jews in other societies in the analysis.<sup>14</sup> The reason is that these societies, or cases, are actually often included in comparability studies and conclusions are drawn. The following analyses comprise empirical testing of whether such comparisons are actually valid.

### *Latent Class Analysis*

Latent Class Analysis identifies sets of discrete, mutually exclusive latent classes by recognizing similar individual response patterns based on the items included in the analyses. Therefore, it is the method of choice for identifying profiles of religiosity. The analysis

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<sup>14</sup> For a discussion on how well Western items work for Muslim Religiosity see El-Menouar, 2014; for a discussion on the predictability of response patterns on Western items in non-Western societies see Bechert and Edlund, 2015.



assigns each individual to a specific cluster consisting of members sharing the high possibility for providing answers to the survey questions in a certain manner. In other words, they show similar religious profiles. Varying numbers of dominant religious profiles are possible across countries.

To test *H1a* the initial step of analysis<sup>15</sup> is to conduct an exploratory LCA across all thirty-five countries.<sup>16</sup> The 35-country LCA model contains the seven indicators and the variable *country* as a covariate. Both, the indicator variables and the latent variables are treated as nominal. Ten models are run for the data on the integrated dataset with all countries and with the number of clusters being increased by one in each model. Determining the model, i.e. number of classes that represent the data best is necessary to correctly interpret the set of profiles. The most suitable criterion in this case is BIC ( $L^2$ ), since it accounts for the large sample sizes.<sup>17</sup>

The LCA model is tested for invariance as follows: a structurally homogeneous model is tested against a partially homogenous model and a heterogeneous model. The heterogeneous model allows country effects for both, the intercepts and the slope parameters. The partially homogenous model allows only for country-specific intercept parameters. Interaction effects between country and latent variables (the latent classes), however, are not allowed, that means the slope parameters are set to zero across groups. Finally, for the structurally homogeneous model intercepts and slope parameters are fixed. If the structurally homogeneous model proves to fit the data best, national profiles are structurally equivalent. If the partial homogeneous model fits the data best, country-profiles can still be regarded as comparable. This is conceptually similar to a metric equivalence model in an MCFA context (Kankaraš,

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<sup>15</sup> Software used: syntax version of Latent Gold 5.0.

<sup>16</sup> Despite very powerful computing technology (4 CPU, each double core; 8GB RAM) it was not possible to accomplish such a huge LCA with the default Latent Gold settings. Following the advice of the Technical LG Guide (2005, p.38) the parameters to be calculated were reduced by the standard error and wald statistics and the calculation was accelerated by only using EM algorithm and not Newton-Raphson. Differences in the results e.g. for the BIC  $L^2$  value due to this procedure manifest just on the second or third decimal.

<sup>17</sup> For a discussion on model selection criteria see for example Bacher and Vermunt, 2010.



Moors and Vermunt 2011, 369). If, however, a fully heterogeneous model fits the data best, profiles cannot be compared, since all measurement model parameters are group specific.

To make sure bigger national samples do not dominate the LCA results over smaller samples, the sample sizes are all weighted to the same size (see also Kankaraš, Moors and Vermunt 2011, 374); the median sample size across all thirty-five countries after weighting (N per country after weight=1232)<sup>18</sup>.

In the event that the invariance test does not prove structural homogeneity, to test *H1b*, subgroups of countries based on the structure of their national LCA profiles will be built to see if the level of heterogeneity can be increased.

## 6. Results

### *Results I: 35-country LCA: Profile description and invariance test*

The BIC<sup>2</sup> value for the models shown in Table 1a is lowest in the three-class model, but it is not significantly higher in the four-class model. Since any three-class model is equal to a four-class model with zero probability in the fourth class, the decision was made in favor of the four-class model (Table 1c) to give the data a bit more room to unfold.

**Table 1a:** statistical parameters for the 35-country LCA homogeneous models

4cluster	Npar	L <sup>2</sup>	BIC (L <sup>2</sup> )	df
Model 1	875	241120.17	-102134.77	32917
Model 2	1785	170437.82	-163327.66	32007
Model 3	2695	146902.20	-177373.82	31097
Model 4	3605	138580.82	-176205.75	30187
Model 5	4515	134173.67	-171123.45	29277
Model 6	5425	130873.16	-164934.50	28367
Model 7	6335	128004.28	-158313.92	27457
Model 8	7245	125764.98	-151063.77	26547
Model 9	8155	123786.35	-143552.95	25637
Model 10	9065	121881.40	-135968.45	24727

For the number of cases included in the single LCAs, see Table A1.

<sup>18</sup> The calculations have shown that weighting actually does not impact the results very much.

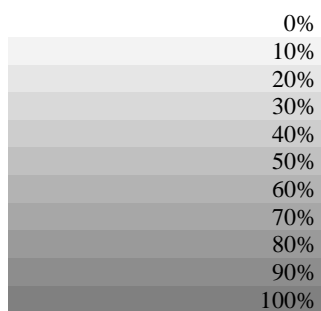


**Table 1b:** 35-country LCA invariance test

<b>4 classes</b>	Npar	$L^2$	BIC ( $L^2$ )	df
Heterogeneous	205	176632.79	-173608.88	33587
<b>Part-Homogeneous</b>	1055	147029.99	-194347.91	32737
Homogeneous	3605	138580.82	-176205.75	30187

Table 1b shows that compared to a heterogeneous and structurally homogeneous model, the partial homogeneous model fits the data best. This indicates that despite all heterogeneity across countries, country profiles can be compared, but structures are not equivalent. Thinking of the different specific religious profiles observed in previous research, the question that arises when looking at Table 1c is: Is there a specific profile that can be recognized?

**Color legend for Tables 1c and 3:**





**Table 1 c:** 35-country LCA – partial homogeneous model, numbers in % (conditional response probabilities\*100)

	Non-Religious	Moderately Non-Religious	Moderately Religious	Very Religious
Cluster size	16	19	31	35
<b>Belief in God</b>				
Strong belief, no doubts	0	5	54	92
	1	17	30	5
	2	22	9	1
	11	37	7	1
	24	16	1	0
No belief, strong doubts	63	3	0	1
<b>Life after death</b>				
Yes	3	10	30	71
	6	29	43	17
	23	38	15	4
No	68	23	12	9
<b>God concerns himself with humans</b>				
Agree	0	2	17	65
	0	9	51	23
	3	37	20	3
	26	37	10	5
Disagree	71	15	2	4
<b>Life is meaningful because God exists</b>				
Agree	0	0	6	44
	0	2	27	32
	1	18	31	11
	16	44	29	9
Disagree	82	36	7	4
<b>Religious and/or spiritual</b>				
Religious and spiritual	0	2	21	62
Religious	2	31	60	28
Spiritual	12	38	16	8
None	85	29	3	2
<b>Church Attendance</b>				
Often	0	0	18	59
	0	2	21	20
	20	57	48	17
Never	80	40	13	4
<b>Praying</b>				
Often	0	3	26	56
	0	9	40	38
	5	48	30	4
Never	95	40	5	1

The answer is: no. Instead of showing specific profiles the classes can be ordered – ranging from low levels of religiosity up to high levels of religiosity; from a profile that can be described as *Non-Religious*, to a *Moderately Non-Religious* and a *Moderately Religious*, on up to a profile of *Very Religious* respondents. With every profile the response probabilities increase towards higher levels of religiosity almost evenly across items. That means the



profiles can be organized on a low-high continuum according to the general strength of religiosity across items. The *Very Religious* profile is with 35% the largest, followed by 31% of those being *Moderately-Religious*, 19% *Moderately Non-Religious* and 16% *Non-Religious*. Ordering the profiles along the low-high continuum makes it possible to see diagonals of response probabilities (see Table 1c), which visualize the legitimacy of this ranking. For example in the first item battery dealing with belief in God, in the *Non-Religious* profile the vast majority of 63% does not believe in God. Across the *Moderately Non-Religious* and the *Moderately Religious* profile the majority then shifts from not believing in a personal God, but in a Higher Power, towards believing, but having doubts, up to finally 92% of those in the *Very Religious* profile knowing without any doubts that God really exists. Similar distributions can be observed for the other items.

To investigate whether structural homogeneity can be observed at all across countries, single LCAs with the same items<sup>19</sup> included are conducted on the basis of the national data sets. A careful analysis of the national LCA patterns identifies the countries with the strongest similarity.

### *Results II: finding a structurally homogeneous subgroup*

The LCAs on the thirty-five national datasets reveal patterns of two to six national profiles of religiosity.<sup>20</sup> Some of these profiles appear more similar than others, as expected. During the investigation-process the patterns were explored very carefully for similarity. In the end the numbers of classes and the structural similarity of response probabilities' patterns were used as criteria for similarity. For this similarity of patterns, it is the characteristics of a cluster that matter, not its size. Let us assume in two different countries three dominant religious profiles

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<sup>19</sup> For later analyses in the national LCAs also the respondents' denomination is included as an inactive co-variate.

<sup>20</sup> All LCA results are available from the author on request.



appear and in all profiles the probabilities that respondents answer to the survey questions in a certain manner appear quite similar. Then, these two countries are attested similarity, independently of the size of the profile. Following the suggestion of Rudnev, Magun and Schmidt (2014, 11) as the statistical criteria for the similarity of patterns the correlation of profiles is used to confirm or contradict the similarity assumption. Profile by profile for every country, the response probabilities on the items are correlated with the respective response probabilities of items in all other countries that seem to show similar patterns. To count as similar, only positive correlations above .5 are accepted. From the single profile correlation coefficients the average correlation for each profile across all countries in the group is calculated. Then, once more, the average of these class specific correlation coefficients is ascertained to offer a quality criterion for the similarity of a whole set of response patterns. In a nutshell, the assignment is based on two criteria: 1) the BIC  $L^2$  value for identifying the appropriate number of classes (religious profiles), and 2) systematic correlation tests of response probabilities. These are the countries with the most striking similarity of religious profiles:

*Belgium (Flanders), Denmark, Finland, Germany, Hungary, Latvia, New Zealand, Norway, Slovenia, Ukraine*

For all these countries a four-class solution fits the data best. The four religious profiles show a strong resemblance to the four profiles identified by the 35-country LCA. In all countries a *Non-Religious*, a *Moderately Non-Religious*, a *Moderately Religious* and a *Very Religious* class can be identified.



**Table 2:** Average Pearson correlation coefficients for each profile class across countries

	Non-Religious	Moderately Non-religious	Moderately Religious	Very Religious
<b>Ø .85</b>	.95	.81	.80	.84

Table 2 reports the correlation coefficients for each profile and the compact average correlation coefficient. Item response probabilities correlate in the *Non-Religious* profile with the exceptionally high coefficient of .95. For the other three profiles they still correlate .80 or higher, which results in a pretty robust average correlation coefficient of .85 for the profiles across the subgroup of countries.

The eleven countries of the identified group are mainly northern and central European. The outer boundaries are Hungary and Slovenia in the south and Latvia and the Ukraine in the east. The only real geographical outlier is New Zealand. What could be the crucial macro indicator responsible for showing similar profiles across certain countries? At first glance, countries appear quite heterogeneous in terms of their denominational structures. In the Nordic countries Protestantism prevails, however, it is commonly understood that the majority we are talking about here are rather secular Protestants (Niemelä 2015; Halman and Draulans 2006), who regard church affiliation more as an “expression of solidarity with society and its basic values” (Hamberg 2003, 50). In Belgium, Hungary and Slovenia the majority of people are Catholic, and in the Ukraine predominantly Christian Orthodox. In Germany, Latvia and New Zealand, however, those who indicate not belonging to any denomination form the biggest group. All together 25% of respondents across this group of countries are non-religious. So, is the uniting element the high level of secularization? At least not exclusively since e.g. the Czech Republic, the least religious country of the ISSP sample shows entirely different profiles and is therefore not part of the group.



Also, there does not seem to be another uniting element, such as cultural closeness or similar recent history, as the exclusively essential factor for the classification. Despite the regional closeness, there are countries having very different cultural backgrounds, recent history, political situations, and experiencing very different levels of affluence.

The four profiles do not reveal specific patterns of particularly high degrees of religiosity with respect to certain dimensions, and particularly low levels on others, but show evenly distributed strength of religiosity across items. Just as the 35-country model and the country-specific models, the classes emerging from the data show a quite distinct ordinal structure and therefore can be ordered on a continuum from low to high levels of religiosity, ranging from a *Non-Religious* profile, to a *Moderately Non-Religious* and a *Moderately Religious*, on up to a profile of *Very Religious* respondents. The most striking difference between the profiles is the general level of religiosity. Again, ordering the profiles along the continuum makes it possible to see diagonals of response probabilities (see Table 3).



**Table 3:** Subgroup LCA patterns, numbers in % (conditional response probabilities\*100)

	Non-Religious	Moderately Non-Religious	Moderately Religious	Very Religious
<b>Cluster Size</b>	26	31	29	15
<b>Belief in God</b>				
Strong belief, no doubts	0	3	33	87
	1	12	42	10
	1	21	11	0
	9	41	13	1
No belief, strong doubts	23	19	1	0
	66	4	0	1
<b>Life after death</b>				
Yes	2	8	17	67
	6	27	47	23
	23	41	23	3
No	69	24	13	7
<b>God concerns himself with humans</b>				
Agree	0	1	8	66
	0	6	45	30
	2	32	31	1
Disagree	21	41	14	2
	77	20	2	1
<b>Life is meaningful because God exists</b>				
Agree	0	0	1	32
	0	1	15	35
	0	10	31	17
Disagree	10	40	41	14
	89	48	12	3
<b>Religious and/or spiritual</b>				
Religious and spiritual	0	2	20	69
Religious	3	25	58	23
Spiritual	11	39	20	7
None	87	34	2	1
<b>Church Attendance</b>				
Often	0	0	6	44
	0	1	11	20
	26	57	65	28
Never	74	42	18	8
<b>Praying</b>				
Often	0	2	15	62
	0	6	36	33
	5	45	43	4
Never	95	48	6	1

For the sake of completeness, it should be asked: Are there any specific profiles emerging from the data we recognize from previous research? As could be expected based on the patterns of the national religious profiles, again, the answer is: no!



**Table 4: Invariance test for the subgroup of 11 countries**

<b>11 countries/4 cl.</b>	Npar	$L^2$	BIC ( $L^2$ )	df
Heterogeneous	3623	133200.94	-181397.93	30169
<b>Part-Homogeneous</b>	<b>1073</b>	<b>137436.68</b>	<b>-203753.52</b>	<b>32719</b>
Homogeneous	223	167375.31	-182678.66	33569

Here the invariance test reveals no higher level of homogeneity than for the full 35-country model. This means that even when building a subgroup of countries with proven very similar response probability patterns it is not possible to reach structural homogeneity across countries.

To take this experiment even further, the most similar countries were tested pairwise. It turned out that structural homogeneity could be established only in Sweden and Norway (correlation .94). In other very similar countries with only marginal lower profile correlation coefficients only partial homogeneity could be found.

**Table 5: Invariance test for the subgroup further reduced: Sweden and Norway**

<b>SE/NO/4 cl.</b>	Npar	$L^2$	BIC ( $L^2$ )	df
Heterogeneous	206	5993.07	-4030,51	1362
Part-Homogeneous	131	6130.31	-4445,09	1437
<b>Homogeneous</b>	<b>106</b>	<b>6260.50</b>	<b>-4498.86</b>	<b>1462</b>

### *Results III: Distribution of denominations across profiles*

Since we did not find any profiles with specific characteristics, emphasizing certain beliefs or religious behavior, it is also not very likely we would find profiles exclusively representing certain denominations. The profiles indicating degrees of religiosity just enable us to see whether there is a distinct pattern suggesting that members of some denominations are generally more religious than members of other denominations.



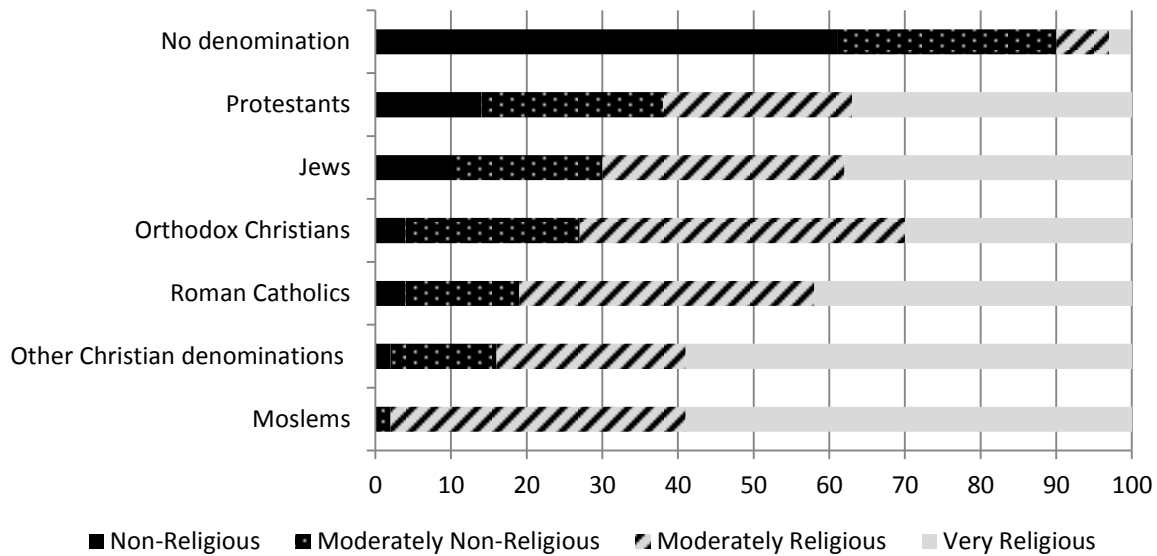
Unsurprisingly, the probability that a respondent who declares not belonging to any denomination shows a *Non-Religious* profile is with 61% very high. 29% show a *Moderately Non-Religious* profile, while despite not being a member of any denomination, 7% appear to be *Moderately Religious* and 3% even show a *Very Religious* profile.

Based on the general conclusions this analysis allows, Catholics across countries appear generally more religious than Protestants. They have an approximately 10% lower probability of showing a *Non-Religious* and *Moderately Non-Religious* profile. Conversely, Catholics are with 14% more strongly represented by the *Moderately Religious* profile and with 5% more represented by the *Very Religious* profile.

Orthodox Christians can be placed between these two other Christian denominations. The majority expresses *Moderately Religious* or *Moderately Non-Religious* views. The probability for Orthodox respondents to show a *Non-Religious* profile is lower than for Protestants, the *Very Religious* profile, however, is also less populated with Orthodox Christians than with Catholics or Protestants.

Jews distribute across profiles most similarly to Protestants with a slightly lower probability for the *Non-Religious* profile and higher probability of expressing *Moderately Religious* views. Muslims are by far the most religious group followed by the, admittedly rather randomly compiled, group of respondents from “other Christian denominations”.





**Figure 1: Distribution of denominations in thirty-five countries across religious profiles**  
 Respondents without denomination N=6647, Roman Catholics N=16499, Protestants N=7341, Orthodox Christians N=1938, Jews N=807, Muslims N=3944, Respondents from other Christian denominations N=588.

The data does not produce denomination-specific profiles, but denominations are not evenly distributed across profiles. The assumption that denomination matters seems to be true, though the analysis makes clear that it is not crucial for individual religious profile formation. Turning to the denomination specific hypotheses, *H2* can be confirmed: Those who do not belong to any denomination predominantly show a profile with low levels of religiosity across all religious dimensions. The 10% of respondents with no denomination in the two religious profiles might be called “believing without belonging”. *H3* and *H4* cannot be confirmed, Catholics do not cluster in a profile emphasizing institutional commitment and Protestants were not found in a specific profile emphasizing belief and spirituality. The same is true for *H5a*. Orthodox respondents do not cluster in a profile characterized by particularly high church attendance next to rather moderate levels of belief or spirituality. As for *H5b* the question of a yardstick arises. The distribution of Orthodox respondents across profiles shows predominantly moderate religious views and behavior. Socialistic worldviews and/or general secularization trends might have (had) an impact on the secularization of the Orthodox that places them in between Catholics and Protestants in terms of their general level of religiosity



across a sample of thirty-five countries. As a whole, these results appear rather universal and might not do justice to the hypotheses comprehensively. Therefore, they will be further discussed in the following section.

## **7. Discussion...**

*...on comparability:*

An LCA across thirty-five culturally very dissimilar countries showed a collective set of religious profiles and at least partial homogeneity. The question that arises, however, is what does the invariance test really prove? It serves to validate that the relationships between the latent variables and the indicators are the same across countries. Still, national-specific LCAs have revealed deviant profiles in a number of countries. Can we nevertheless assume that the items on religiosity, really measure the same across Turkish Muslims, Mexican Catholics, and Kenyan Protestants? The answer must be: Measurement validity and conceptual validity are not the same things. Yet across the sample of thirty-five countries single profile structures are so similar that we have good reason to believe that comparisons are actually meaningful. Moreover, the analyses clearly demonstrate that similarity of religious structures need not depend exclusively on societies' cultural closeness or denominational similarity. Achieving structural homogeneity across countries seems almost impossible with a comprehensive set of items that takes into account the different dimensions of religiosity. Reducing the large group down to eleven countries showing structurally very similar profiles still does not produce test results indicating structural homogeneity. Only across just two in many aspects very similar countries (Norway and Sweden) structural homogeneity could be established.

*...on the impact of denomination:*

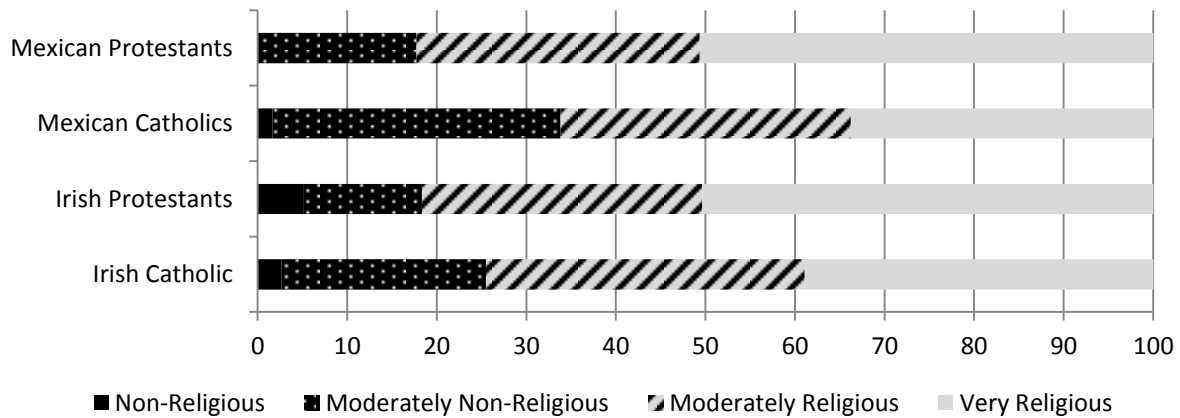
The theory-based expectation was that denominations shape the structure for individual religious profiles. Members of the same denomination were expected to show similar



religious profiles. These expectations were only partly met. First, as discussed above, the typology across thirty-five countries did not reveal any specific profiles reflecting characteristics for denominations based on religious doctrine. Therefore, membership on the profiles which appear cannot be clearly predicted by denomination. Only certain trends could be observed: The most religious respondents are Moslems, followed by Roman Catholics, Orthodox Christians, Jews and Protestants. The vast majority of those without denomination show no signs of religiosity.

One crucial factor affecting the theory-based expectations has not been discussed so far: the country itself. There are actually good reasons to believe that country-specific factors, such as the general level of secularization, the denominational composition of society and the religion-related conflict potential affect the way religion is lived and communicated within the same denominations across countries. Mono-religious societies being rather the exception, most countries differ in their denominational composition. Religious pluralism, however, triggers different social mechanisms, such as religious competition (Iannaccone 1992), religious conflicts, or diaspora effects. In situations of conflict and diaspora effects, religion might even become a badge for ethnic group identity (Bruce 1996). As a result these mechanisms tend to strengthen religious affiliation for the minority group (Cesari 2013). Just to have a glimpse at two examples: contradicting the general pattern, the data on Ireland shows that the 2% of Protestants in the Irish sample have a 50% probability for showing the most religious profile compared to 39% of the Irish Catholic majority. In Mexico the 6% Protestant minority also with 51%, have a higher probability for the most religious profile compared to 34% of the Catholic majority. These are only two examples that feed the theoretical assumption of there being differences between denominations across countries, or, methodologically spoken: an interaction effect of country and denomination.





**Figure 2:** Distribution of Protestants and Roman Catholics in Ireland and Mexico across religious profiles

## 8. Conclusion and Outlook

This paper is based on an examination of data on religious attitudes and behavior collected from thirty-five countries worldwide. Typologies could be empirically derived from this data: one comprehensive typology, and on the basis of a more detailed analysis, a typology on a subgroup of countries showing structurally very similar religious profiles. The analyses have attested to comparability of the data, but no structural homogeneity; and some trends of denominational clustering in profiles were revealed, which is only partly in line with theoretical expectations. Based on these findings future research should make an effort to disentangle possible interaction effects of country-specific macro indicators and denomination influencing individual religious profile development.

One of the most remarkable findings, however, is that the typological measurement approach identifies classes that can be ordered on one latent continuum rather than showing specific characteristics emphasizing single dimensions of religiosity. While Pearce, Hardie and Foster (2013, 57) claim that “humans are rarely consistently low, medium, or high across dimensions of religiosity including institutional involvement, private practice, salience, or belief”, the



results of this study show that this need not necessarily be the case. Religious profiles can actually be ordered on a low-high continuum according to the general strength of respondents' religiosity. While Storm states "variations in religiosity are often differences in pattern rather than degree" (Storm, 2009, 716), the results at hand suggest rather that variations in religiosity are often just that: differences in degree.

What does this finding mean for future research? It suggests that, contradictory to the research opinion presented in this paper and earlier research results, religiosity can actually be measured on one continuum. For the measurement options it means these results provide good reasons to apply ordered latent class analyses (see for example Croon 1990). But also factor analyses, producing continuous factors could be utilized to validly measure religiosity. The consequential next step for research, therefore, is to test multi- and single-item continuous measures of religiosity against the latent classes and compare the explanatory potential of the two approaches.



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## Appendix

**Table A1:** List of countries, original sample sizes and sample sizes in the LCAs

Country	N original sample	N cases included in national LCA
Australia	1624	1144
Austria	1012	681
Belgium (Flanders)	1232	892
Chile	1487	1284
Croatia	1185	968
Cyprus	998	752
Czech Republic	1475	1224
Denmark	1913	1310
Dominican Republic	2037	1894
Finland	1103	727
France	2356	1611
Germany	1694	1168
Hungary	999	826
Indonesia	1939	1825
Ireland	2046	1687
Israel	1170	878
Italy	1076	913
Kenya	1476	1374
Latvia	1052	877
Mexico	1448	1076
New Zealand	948	686
Norway	1059	652
Philippines	1112	938
Poland	1262	948
Portugal	994	848
Slovak Republic	1119	897
Slovenia	1052	798
Sweden	1211	796
Turkey	1440	1302
Ukraine	1937	1109
Great Britain	1916	1288
Tanzania	1474	1363
United States	1317	1200
Uruguay	990	910
Venezuela	1062	918