

# Human Values and Trust in Institutions across Countries: A Multilevel Test of Schwartz's Hypothesis of Structural Equivalence

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The goal of this article was to show how structural equation modelling associated to multilevel regressions represents a powerful tool to examine innovative cross-cultural research questions. The relationship between values and trust in institutions was investigated in four cross-cultural datasets: three were students and teacher samples; the last was a general sample from the 2005 World Values Survey (WVS). The hypothesis of equivalence of the structure of relations between values and trust in institutions (sinusoid curve hypothesis) was tested with a series of multilevel multiple indicators and multiple causes models with random slopes. Structural equivalence was confirmed for student samples, but not for the general sample. The between-country variance of the relationship between values and trust in the general sample was partially explained by country level differences in socio-economic wealth and quality of governance.

**Keywords:** values, trust in institutions, multilevel structural equation modelling, World Values Survey

## 1 Introduction

The structure of human values proposed by Schwartz (1992) has been studied with different multidimensional scaling techniques (e.g., Borg and Shye 1995; Fontaine et al. 2008; Schwartz 1992). Researchers have also examined the configural, measurement, and metric invariances of instruments developed to assess human values across cultures, including the Schwartz Value Survey (SVS) and the Portrait Values Questionnaire (PVQ) (e.g., Davidov 2010; Davidov et al. 2008; Schmitt et al. 1995; Schwartz et al. 2001; Schwartz and Boehnke 2004, Spini 2003). In addition, researchers have used Schwartz's (1992) theory to investigate the relations between values and a variety of social attitudes. Combining and integrating these distinct foci, the goal of the present research was to illustrate how structural equation modelling associated to multilevel regressions can be used to examine the relationship between values and a construct of interest (here trust in institutions) across cultures.

Devos, Spini and Schwartz (2002) hypothesized that variations in the extent to which individuals expressed trust in institutions were rooted in a conflict between values connected to conservation and openness to change. Often, institutions contribute to the preservation and transmission of traditions and ensure the stability and continuity of society. Thus, trust in institutions should go hand in hand with valuing conformity and tradition, but should be inversely related

to an attachment to individual autonomy and responsibility. In line with Schwartz's (1992) theory, trust in institutions was positively linked to values such as security, conformity, and tradition, but was negatively correlated with values on the opposite side of the circumplex structure, such as self-direction, hedonism, and universalism. In other words, the relationship between values and trust in institutions fitted a sinusoid curve consistent with the circular structure of the value system.

The sinusoid curve hypothesis was also tested between value priorities and opinions about government interventions to support human rights (Spini and Doise 1998, 2005). As expected, the bottom peaks of the curve (negative correlations) were on self-direction and universalism and top peaks (positive correlations) were on security and conformity. Using a similar framework, other researchers have examined patterns of associations between value priorities and the constructs of readiness for contact with outgroup members (Sagiv and Schwartz 1995), authoritarianism (Cohrs et al. 2005), social dominance orientation (Caricati 2007), nationalism and human rights (Kuşdil and Şimşek 2008), and national identification (Roccas et al. 2008).

Most applications of Schwartz's (1992) theory have been performed at the individual level, neglecting cultural and contextual effects. A contextual effect occurs when belonging to certain contexts (e.g., country) explains inter-individual variance better than or in addition to individual characteristics. Across several social science disciplines, an interest in the interaction between contexts and individuals has sparked insightful theoretical perspectives and methodological approaches (e.g., Coleman 1990; Klein and Kozlowsky 2000; van de Vijver and Leung 1997). Capitalizing on this tradition, our goal was to incorporate this level of analysis in research on human values. Thus, we turned

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our attention to research that would help us tackle historical-societal variations in value priorities and related constructs.

### *Values, Trust, and Cross-Country Differences*

Differences in value priorities across countries call for top-down theories taking into account variance measured at the country-level. According to modernization theory (Inglehart 1977; Inglehart and Welzel 2005; Maslow 1959), values are affected by contextual factors that constrain everyday life conditions, such as economic development and political climate. For instance, when survival is at stake, material needs become central and consequently people's priorities are centred on personal and social security or stability. By contrast, when contextual factors guarantee some comfort, other needs come to the forefront such as freedom and liberty. As Welzel (2006) put it, social contexts that afford a range and abundance of individual resources, with economic, political, educational, and networking opportunities, release constraints on choices and increase autonomy values, as opposed to authoritarian and conservation values. Thus, value orientations, national socio-economic wealth, and the assets of political institutions are deeply interrelated. Translating this proposition into Schwartz's (1992) theory of human values, we would expect that, in such contexts, self-direction, stimulation, hedonism, universalism, and egalitarian values are more emphasized than conformity, tradition, security, power, and achievement. Consistent with this argument, Schwartz (2004) showed that democratic values, such as egalitarianism and universalism, were positively related to the absence of corruption in political institutions and good governance.

Arguably, trust in institutions is similarly affected by contextual factors. When individual autonomy becomes a priority, institutions are more likely to be appraised as constraining and less confidence is prompted. Following modernization theory (Inglehart and Welzel 2005), socio-economic development leads to a change in fundamental needs. The result is paradoxical: trust in institutions and authorities declines in longstanding democratic and wealthy countries (Dalton 2004). However, as Inglehart (1999) noted, socioeconomic and democratic developments do not erode trust per se, but shift value priorities in a direction that implies a more critical attitude towards authorities.

### *A Multilevel Approach to Values and Trust in Institutions*

Given that values and attitudes towards authorities are interlaced between individual and societal levels, it is important to adopt data analysis techniques that consider simultaneously variance across individuals and contexts. As Steinmetz and colleagues (2009) pointed out, multilevel modelling represents a useful instrument to meet this challenge. Multilevel modelling allows researchers to test simultaneously the relationships between attitudes and values and the cross-national equivalence of these relationships. In addition, Multilevel Structural Equation Modelling (ML-SEM) represents a flexible instrument that can account for both

methodological and substantive aspects of research on values.

Although some studies on human values have relied on a multilevel methodology (Schwartz 2006a), these studies have focused primarily on the main effects of values (at both the individual and country levels) on some specific attitudes rather than testing the between-country structural equivalence of the attitudes-values relationships (if and how relationships between attitudes and values vary across countries).

As noted earlier, there is a gap between studies examining contextual influences on the value structure and studies testing the pattern of associations between value priorities and social attitudes at the individual level. By adopting a multilevel approach, and in particular a ML-SEM approach, our main goal was to bridge these two research orientations. In summary, this study aimed to investigate the relationship between the value structure and trust in institutions at both the individual and country levels, and test the cross-country equivalence of the value structure at the individual level.

### *The Present Research*

First, the cross-country structural equivalence hypothesis of the values in relation to attitudes towards institutions was investigated comparing different datasets. If the relationship between values and attitudes is not accounted for by cross-country differences, cross-country variance of the ten values should not be significant. That is, using a multilevel approach, the variance component of the slope of the ten values should not be significant (hypothesis of equivalence across countries). In addition, if the relationship between values and attitudes is universal, such result should not depend on sampling issues and should be replicated using different datasets (hypothesis of equivalence across datasets) or different categories of respondents (hypothesis of equivalence on student vs. non-student participants).

Therefore, following the pioneer demonstration provided by Sagiv and Schwartz (1995), the ten values should predict trust in institutions following a sinusoid pattern in which two values on opposite sides of the circumplex structure represent the highest and lowest peaks of the curve. The other values are scaled according to their distance from the highest and lowest peak on the circle. As mentioned earlier, Devos et al. (2002) followed this logic to demonstrate that trust in institutions was most strongly positively correlated with conservation values (conformity, tradition and security) and increasingly less positively correlated with other values going around the value circle, in both directions, to self-direction, for which the strongest negative correlation was expected. This is consistent with the aforementioned idea that institutions contribute to maintain social order and stability in society, restraining the freedom of individuals.

If values are positioned on an axis according to their order around the value circle and assuming that the relationship does not vary across countries, once the cross-country variance is parcelled out, the strength of associations between the values and trust in institutions should follow a sinusoid curve with the highest peak in conservation values and the

lowest peak in self-direction. More precisely, coefficients at the individual level should be ordered as follows: (+3) security, (+2) conformity and power, (+1) tradition and achievement, (1) benevolence and hedonism, (2) universalism and stimulation, and (3) self-direction. Numbers from +3 to -3 do not represent expected magnitudes of relations but depict the positions on the curve. The sinusoid curve hypothesis is therefore statistically tested by examining the Spearman's rank correlation coefficient between the theoretical and empirical patterns of relations (Devos et al. 2002).

## 2 Model and Data Sets

Following Spini (1999), we used a multilevel Multiple Indicators and Multiple Causes (MIMIC, Bollen 1989) model with random slopes, in which one latent dimension is underlying the outcome variables and is predicted by the ten values. As would be the case in a single-level MIMIC, this type of model measures the effect of several observed variables on a latent variable specified by at least three indicators. In addition, it assesses the variance of relationship between the dependent and independent variables across two nested levels. In the present model, the first level was represented by individuals and the second level by countries. To facilitate the comparison and interpretation of results at the two levels, factor loadings were constrained to be equal across levels (Marsh et al. 2009). As customary for multilevel confirmatory factorial analyses, the factorial structure of the dependent variables (here trust in institutions) was tested at the two nested levels. Independent variables (here the ten values at the individual level and socio-economic and political proxies at the country level) were controlled for their covariance. In addition, random slopes of the independent variables at the individual level were inserted at the second level, namely the variance across countries of the relationship between dependent and independent individual variables. Analyses were performed using Mplus 6.1 (Muthén and Muthén, 1998–2010).

We used a multilevel MIMIC model with single latent construct, in which individuals were nested within clusters. Relying on Preacher, Zyphur and Zang's (2010) notation, the model was defined as follows:

$$Y_{ij} = \nu_j + \Lambda_j \eta_{ij} + K_j X_{ij} + \epsilon_{ij} \quad (1)$$

$$\eta_{ij} = \alpha_j + B_j \eta_j + \Gamma_j X_{ij} + \zeta_{ij} \quad (2)$$

$$\eta_j = \mu + \beta \eta_j + \gamma X_j + \zeta_j \quad (3)$$

where  $i$  and  $j$  indicated respectively individuals and countries,  $Y_{ij}$  was a  $p$ -dimensional vector of  $p$  measured variables. In equation (1), the vector  $\nu_j$  was a  $p$ -dimensional vector of variable intercepts and  $\epsilon_{ij}$  a  $p$ -dimensional vector of residuals;  $\Lambda_j$  was a  $p \times m$  matrix of factor loadings where  $m$  was the number of latent variables in both within and between-level models, including random slopes if any were specified;  $\eta_{ij}$  was a  $m \times 1$  vector of random effects; and  $K_j$  is  $p \times q$  matrix of slopes for the  $q$  exogenous covariates in  $X_{ij}$ . The structural model was defined in equation (2) such that  $\alpha_j$  was a  $m \times 1$  vector of intercept terms,  $B_j$  was a  $m \times$

$m$  matrix of structural regression parameters,  $\Gamma_j$  was a  $m \times q$  matrix of slopes parameters for exogenous covariates and  $\zeta_{ij}$  was a  $m \times 1$  vector of latent variable regression residuals. Residuals in  $\epsilon_{ij}$  and  $\zeta_{ij}$  are assumed to be normally distributed and with covariate matrices  $\Theta$  and  $\Psi$ , respectively. Similarly, the multilevel structural part was expressed in equation (3), such that  $\mu$  was a  $r \times 1$  matrix of  $r$  random effects distribution and intercepts of the between-level structural equations;  $\beta$  was a  $r \times r$  matrix of regression slopes of random effects regressed on each other;  $\eta_j$  was a vector of all random effects;  $\gamma$  was a  $r \times s$  matrix of regression slopes of random intercepts regressed on exogenous between-level regressors;  $X_j$  was a  $s$ -dimensional vector of all cluster level covariates; and  $\zeta_j$  indicated between-level residuals, with normal distribution and covariance matrix  $\Psi$ .

## Data

Three datasets were used to test the hypotheses (see Appendix 1).

[Schwartz 1996]. A dataset of 4,757 participants (students and teachers of different educational levels) was collected in 17 countries in 1996. Gender distributions was 41% male and 59% female, mean age was 23.1 years old (SD = 4.8). Data were provided by Professor Shalom Schwartz to Dario Spini in 1999.

[Spini 1996]. A dataset of 3,838 participants (university students) from 21 countries, collected in 1996 (Spini 1997)<sup>1</sup>; 44% of participants were male and 56% female, mean age was 23.6 years old (SD = 4.6).

[World Values Survey 2005]. The fifth wave World Values Survey (WVS)<sup>2</sup> included a 10-item instrument measuring Schwartz values. To compare the WVS to the other datasets, only student respondents were selected in a first step. The student sample was composed of 3,031 participants representing a total of 36 countries. Gender distribution was 49% male, 51% female, mean age was 21.6 years old (SD = 7.2).

To test the hypothesis of equivalence on non-student participants, analyses were also performed on the non-student sample of the WVS, composed of 29,279 participants from 43 different countries. In this case, the sample was 51% male and 49% female, mean age was 41.4 (SD = 15.4). The sample was relatively heterogeneous in terms of criteria such as job status (61.2% employed, 12.3% unemployed, 12% housewives, 11.7% retired, 2.8% other), social class (1.4% upper class, 50.4% middle class, 25.1% working class, 10.9% lower class, 12.2% did not answer), or level of education (5.8% with no formal education, 21.7% attended primary school, 50.9% attended some secondary school; 21.1% attended the university). Analyses were weighted with population weights provided by the WVS.<sup>3</sup>

<sup>1</sup> Data will be available at DARIS-FORS ([www2.unil.ch/daris](http://www2.unil.ch/daris)).

<sup>2</sup> Data were retrieved from the WVS website ([www.worldvaluessurvey.org](http://www.worldvaluessurvey.org))

<sup>3</sup> More information on the sample composition and weights are available in the official WVS codebook ([www.wvsevsvdb.com/wvs/WVSDocs.jsp?Idioma=1](http://www.wvsevsvdb.com/wvs/WVSDocs.jsp?Idioma=1))

### *Dependent Variables*

**Trust in Institutions.** Trust in institutions was measured by asking respondents to report their level of confidence in a number of institutions. For the Schwartz 1996 dataset, participants expressed their level of confidence using a 3-point scales ranging from (1) “low” to (3) “high”. Following Billiet and Meuleman (2007), trust in institutions was defined as confidence in the political system, the judicial system, and the police. The same items were selected in the WVS, in which respondents indicated their level of confidence on 4-point scales ranging from (1) “none at all” to (4) “great deal of confidence”.

Cross-cultural research on political attitudes shows that this measure of trust in institutions has a good reliability and consistency across countries (Listhaug and Wiberg 1995; Mishler and Rose 1997; Schyns and Koop 2010; Zmerli and Newton 2008). Analyses on the European Social Survey highlighted that metric and scalar invariance of this measure was persistent across most European countries (Allum, Sturgis and Read 2010; Billiet and Meuleman 2007). Thus, we assumed trust in institutions having at least a partial metric equivalence.

For the Spini 1996 dataset, trust in institutions was assessed using a slightly different indicator. Participants were asked whether their national government should be involved actively in the respect and defence of three categories of human rights: fundamental rights, individual rights, and socio-economic rights (Spini 1997). Each category was composed of three specific rights taken from the Universal Declaration of Human Rights. Answers were provided on 9-point bipolar scales with high scores reflecting a greater confidence in the government to protect these rights. For each of the nine human rights, two separate items were administered: respondents indicated to what extent they considered that the government was invested or not in the application of the right (e.g., the government is invested in a concrete way in the application of this right vs. the government is not invested in a concrete way in the application of this right) and to what extent they considered that the government was engaged sufficiently in the defence of that right (e.g., the government is committed enough to the application of this right vs. the government is not committed enough to the application of this right). Partial metric invariance was assessed in Spini (1997).

### *Independent Individual Variables*

**Schwartz’s Values.** In Spini 1996 and Schwartz 1996, values were measured with, respectively, 45 and 46 value items taken from the 57-item Schwartz Values Survey (SVS, Schwartz 1992), which respected the criterion of the 75% of correct location across samples (Schwartz 1994). The WVS included a 10-item version of the PVQ. Based on previous studies, we assumed partial metric invariance measurement of SVS and PVQ (Davidov 2010; Davidov et al. 2008; Schmitt et al. 1995; Schwartz et al. 2001; Spini 2003). Thus, in Spini 1996 and Schwartz 1996, value scores were computed as the average of at least 3 value items. For the WVS,

values were assessed by 10 single items. Despite the potential of the WVS for its cross-country coverage, the restricted number of items for the value scale assumes a measurement invariance which cannot be statistically tested.

### *Independent Contextual Variables*

To examine the relationship between values and contextual factors using ML-SEM, several country-level variables were considered. According to modernization theory (Inglehart and Welzel 2005; Welzel 2006), attitudes toward institutions and authorities are strongly influenced by the socio-economic wealth at the societal level and the assets of political institutions (Inglehart 1999). For other scholars (Dahl 1999; Schwartz 2004), individual value orientations are linked to the fairness of authorities and political climate. Thus, two proxies were included in the analyses, socio-economic wealth and quality of governance, expecting they had respectively negative and positive relationships with trust in institutions.

**Socio-Economic Wealth.** The level of socio-economic wealth was measured with the Weighted Index of Social Progress (WISP; Estes 1997) from 1995, which is based on country performances on 45 social, political, and economic indicators (including health, education, social services and welfare, population changes, economic growth, and ethnic/religious composition of the population). It also assesses the impact of military expenditures, environmental issues, and political factors on overall development patterns. Single indicators are weighted using scores derived from a two-stage varimax factor analysis that determines the relative contribution of each indicator in explaining the variance associated with changes in social progress over time. WISP scores are obtained through a sum of these weighted indicator scores; they can range from 0 to 100. In our data, WISP scores ranged from 1.2 (Ethiopia) to 93.1 (Sweden).

**Quality of Governance.** Political climate was measured with the Worldwide Governance Index (WGI; Kaufmann et al. 2008), which capture six key dimensions of governance between 1996 to 2005: voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. Overall WGI scores were obtained by summing these indicators; they can range from -15 to 15. In our data, WGI scores ranged from -6.38 (Ethiopia) to 11.18 (Finland).

In addition to these socio-economic variables, given the different size of clusters in each dataset, models were controlled for a possible effect of sample size on the cross-sample variance (Hox 2002).

## 3 Results

Four models, exemplified in Figure 1, were tested. Model 1 was performed on the Schwartz 1996 dataset. It tested whether responses to the trust in institutions items were explained by one single latent factor. Following Spini (1997, 1999), values were entered as predictors of the latent variable at the individual level, controlling for their covariance and introducing the mean individual’s response to

all value items as a covariate (Schwartz 2003). The factorial structure of trust in institutions was tested also at the between-country level, with factor loadings constrained to be equal across the two levels (Marsh et al. 2009); social progress (WISP), wellness of governance (WGI), and sample size were introduced as second level predictors controlling for their covariance.

The test of Model 2 was carried out on the Spini 1996 dataset. The model was identical to the previous one with the exception of the variables specifying the latent factor of trust. In Model 2, the latent dimension was tapping trust in the governmental institutions for the defence of three categories of human rights. Model 3 and 4 were based on respectively student and non-student respondents of the WVS 2005 dataset. The latent factor was specified as in Model 1. In Model 4, a binary variable was added at the second level to control whether the sample was a population sample or not (1 = population; 0 = non-population).

Following Muthén (1994), models for each dataset were tested first separately on pooled-within and pooled-between matrices. Next they were merged together in a two-level design. Table 1 reports final unstandardized coefficient estimates for the four models. A common problem with ML-SEM and cross-country research is that the usual number of countries covered by international surveys is lower than the number of parameters necessary for a ML-SEM model (Meuleman and Billiet 2009). A Monte Carlo study (Muthén and Muthén 2002) on our models showed that estimates for within-level regression coefficients and standard errors and between-level coefficients are reliable, while between-level standard errors may be underestimated. Given that the Monte Carlo study revealed a bias of the standard errors between the 4% and 20%, we considered  $p < .01$  (instead of the conventional .05) as the minimum level of significance for the between-level parameters to minimize the risks of Type I error.

In Model 1, intraclass correlation coefficients (ICCs) for each of the single indicators were: .10 for trust in the political system, .15 for trust in the judicial system, and .14 for trust in the police. Model fit indices were calculated on models without random slopes<sup>4</sup>: CFI = .989; RMSEA = .017; within SRMR = .012; between SRMR = .066.

In Model 2, ICCs were: fundamental rights = .19, individual rights = .07, and socio-economic rights = .24. The factorial structure was consistent at both levels; model fit indices were in line with previous single-level analyses on this dataset (Spini 1999): CFI = .993; RMSEA = .019; within SRMR = .005; between SRMR = .013.

For Model 3, ICCs for single indicators were: trust in the judicial system = .18, trust in political system = .17, trust in the police = .14. For Model 4, ICCs were: trust in the judicial system = .18, trust in political system = .20, trust in the police = .17. Both models based on the WVS were consistent at the two levels; fit indices of model without random slopes for the student sample (Model 3) were: CFI = .995; RMSEA = .014; within SRMR = .009; between SRMR = .064; for the rest of the sample (Model 4) fit indices were: CFI = .978; RMSEA = .013; within SRMR = .008; between SRMR = .058.

In line with modernization theory, the socio-economic level of the country (WISP) was negatively associated with trust in institutions in Models 1 and 4 and a marginal effect was found in Model 3. In Model 2, the main effect of WISP was not significant. Thus, results partially confirmed that people criticized institutions more in countries with a higher level of social and economic wealth than in countries characterized by relatively low levels of social progress. In addition, a strong association was found between well governance (WGI) and trust in institutions. In line with Schwartz (2004), people tend to trust institutions more when they are transparent, accountable, and well functioning. Sample size differences did not result in statistically significant effects with the exception of Model 4. Finally, no reliable differences were found between population and non-population samples.

### *Hypotheses of Structural Equivalence*

To test the hypothesis of structural equivalence across countries, the random slope of each value was introduced in the model. Results reported in Table 1 show that no significant cross-country variance component (namely, random slope) was found in the Schwartz 1996 dataset (Model 1). That is, the relationship between each value and trust in institutions did not vary significantly across country samples. Thus, the hypothesis of structural equivalence across countries was confirmed for this dataset. According to the hypothesis of structural equivalence across datasets results should not depend on the type of data and should be replicated across datasets. As expected, Model 2 was similar to Model 1 (see Table 1) with the exception of the slope of self-direction, for which the random component was significant. No significant cross-country interactions were found between self-direction and second level predictors; the final between-country residual variance of self-direction was therefore significant.

In Model 3 (WVS student sample), no significant cross-country structural variance was observed on eight out of ten values, in line with the hypothesis of structural equivalence. However, the slopes for stimulation and tradition varied significantly across countries. Such variance in slopes reflects a significant negative interaction between WISP and tradition and a marginal interaction between WGI and stimulation. More precisely, in countries with a relatively higher WISP, tradition had a weaker relationship with trust in institutions. Similarly the relation between stimulation and trust was lower in high WISP countries, but it also tended to be higher in high WGI countries. After controlling for the interaction with the second-level variables, the residual variance of the random slopes was no longer significant. Thus, with 27 out of 30 non significant random components of slopes, we can consider the hypothesis of structural invariance across datasets confirmed.

<sup>4</sup> Common fit indexes used in structural equation modelling such as CFI, SRMR and RMSEA can not be computed in multilevel models with random slopes. The goodness of fit of models with random slopes was estimated using likelihood ratio test between models with and without random slopes (Berger and Casella 2002).

Table 1: Maximum Likelihood with Robust Standard Error Estimates for the MIMIC Models, Controlled for Individual Mean Responses on the Ten Values.

Parameter	Model 1 Schwartz 1996	Model 2 Spini 1996	Model 3 WVS Students	Model 4 WVS Non-student
<b>Fixed effects</b>				
<b>Factor loadings</b>				
$\lambda_2$	.988 (.107)**	.878 (.025)**	.972 (.045)**	.598 (.018)**
$\lambda_3$	.751 (.062)**	.746 (.028)**	.639 (.038)**	.942 (.032)**
<b>Within-level</b>				
$\gamma_{10}$ Po	.016 (.005)*	.022 (.020)	.009 (.018)	.018 (.007)*
$\gamma_{20}$ Ac	.016 (.005)*	.111 (.018)**	-.009 (.017)	.009 (.006)
$\gamma_{30}$ He	.001 (.007)	-.014 (.021)	.017 (.017)	-.011 (.005)†
$\gamma_{40}$ St	-.006 (.007)	-.012 (.021)	.004 (.013)	.002 (.006)
$\gamma_{50}$ Sd	-.038 (.009)**	-.168 (.053)**	-.022 (.017)	-.012 (.006)†
$\gamma_{60}$ Un	-.041 (.009)**	-.055 (.044)	.027 (.016)	.011 (.007)
$\gamma_{70}$ Be	.017 (.009)	.012 (.026)	.025 (.016)	.028 (.008)**
$\gamma_{80}$ Tr	.027 (.007)**	.144 (.034)**	.036 (.013)*	.032 (.007)**
$\gamma_{90}$ Co	.020 (.008)*	.095 (.031)*	.044 (.012)**	.021 (.007)*
$\gamma_{100}$ Se	.031 (.007)**	.123 (.040)*	.012 (.021)	-.001 (.006)
<b>Between-level</b>				
$\gamma_{01}$ WISP	-.015 (.006)*	.110 (.026)**	-.006 (.003)†	-.009 (.003)**
$\gamma_{02}$ WGI	.069 (.021)**	-.010 (.008)	.057 (.012)**	.054 (.011)**
$\gamma_{03}$ Sample size	.001 (.001)	.001 (.002)	.001 (.001)	.001 (.001)*
$\gamma_{04}$ Population sample				.070 (.090)
$\varphi$	52.1 (23.1)†	83.3 (23.3)**	81.3 (18.5)**	88.1 (16.2)**
<b>Cross-level interactions</b>				
$\gamma_{11}$ WISP/Po				-.001 (.001)**
$\gamma_{41}$ WISP/St			-.004 (.001)**	
$\gamma_{71}$ WISP/Be				-.001 (.001)†
$\gamma_{81}$ WISP/Tr			-.002 (.000)**	
$\gamma_{42}$ WGI/St			.010 (.004)†	
$\gamma_{62}$ WGI/Un				-.003 (.001)†
<b>Random parameters</b>				
<b>Random variance of slopes</b>				
$\tau_1$ Po				.002 (.001)**
$\tau_2$ Ac				.001 (.001)†
$\tau_3$ He				.001 (.001)*
$\tau_4$ St			.007 (.003)*	
$\tau_5$ Sd		.018 (.007)*		
$\tau_6$ Un				.001 (.001)*
$\tau_7$ Be				.002 (.001)*
$\tau_8$ Tr			.005 (.002)*	.001 (.001)*
$\tau_9$ Co				.001 (.001)*
<b>Residual variances</b>				
$u_{ij}$				.001 (.001)*
$u_{4j}$			.002 (.001)	
$u_{6j}$				.001 (.001)*
$u_{7j}$				.002 (.001)**
$u_{8j}$			.002 (.001)	
$\zeta_{1ji}$	.090 (.014)**	2.046 (.172)**	.400 (.032)**	.408 (.023)**
$\epsilon_{1ji}$	.254 (.015)**	.424 (.050)**	.228 (.020)**	.262 (.027)**
$\epsilon_{2ji}$	.265 (.014)**	.997 (.077)**	.272 (.016)**	.261 (.026)**
$\epsilon_{3ji}$	.266 (.015)**	1.181 (.099)**	.405 (.021)**	.434 (.029)**
$\zeta_{1j}$	.018 (.007)*	.460 (.181)*	.079 (.045)	.097 (.034)*
$\epsilon_{1j}$	.027 (.016)	.001 (.001)	.008 (.013)	.024 (.014)
$\epsilon_{2j}$	.026 (.011)†	.099 (.037)*	.028 (.013)†	.001 (.001)
$\epsilon_{3j}$	.014 (.006)†	.097 (.031)*	.052 (.022)†	.044 (.016)*
<b>n of clusters</b>	17	21	36	43
<b>n</b>	4757	3830	3031	29279

Notes: Standard Errors are reported in parenthesis;  $\gamma$ s are regression coefficients;  $\varphi$  is correlation between WISP and WGI;  $\tau$ s are variance components of slope, and  $u$ s are their residuals unexplained by the cross-level interaction;  $\zeta$ s are the unexplained residual of latent factors;  $\epsilon$ s are residual variance of the indicator variables; Po = Power; Ac = Achievement; He = Hedonism; St = Stimulation; Sd = Self-direction; Un = Universalism; Be = Benevolence; Tr = Tradition; Co = Conformity; Se = Security; †p < .05; \* p < .01; \*\* p < .001.

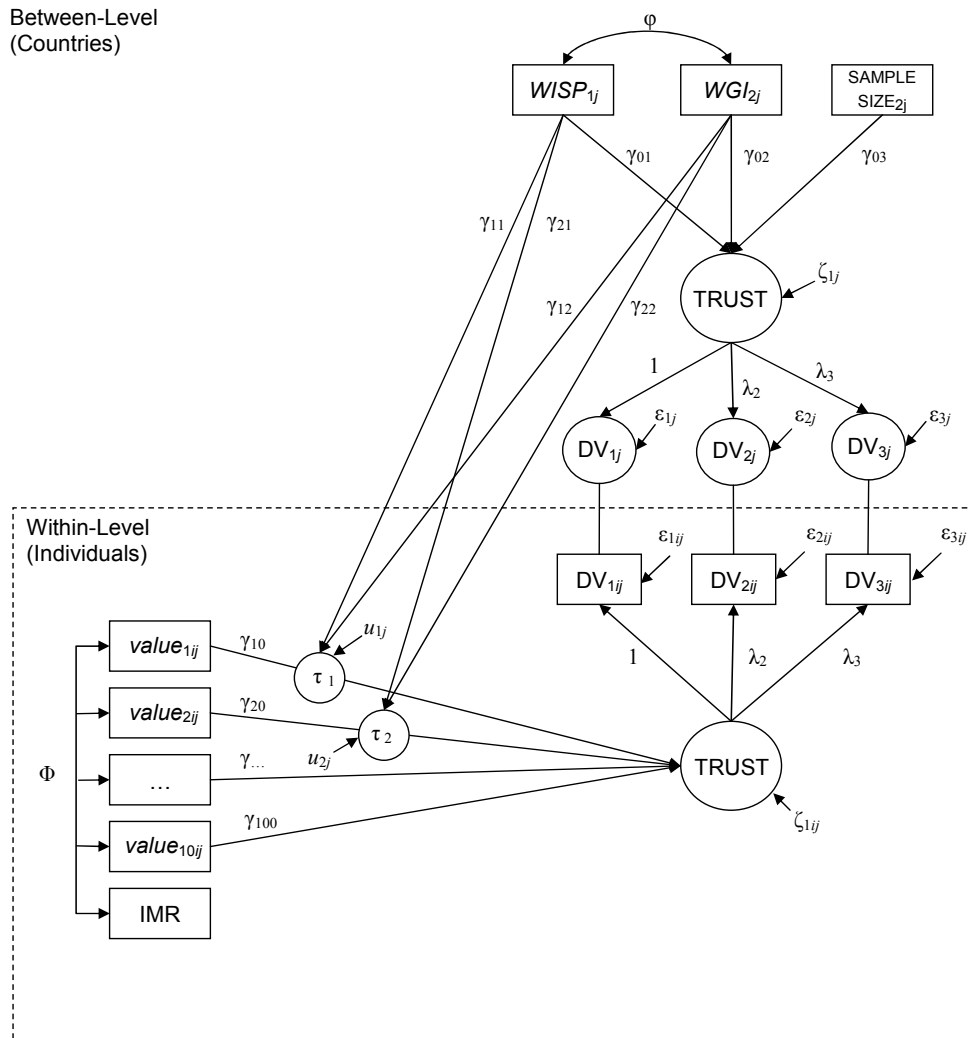


Figure 1. Example of the Multi-Level Multiple Indicators and Multiple Causes model of trust in institutions and values. DV1-3 represents measured individual dependent variables (i.e., indicator of trust in institutions); on the left hand of the latent variable of trust in institutions at the within-level are the ten Schwartz values, IMR = Individual mean response; in the between-level WISP = Weighted Index of Social Progress; WGI = Worldwide Governance Index.

Given that Models 1 to 3 were performed on student samples, following the hypothesis of structural equivalence across social categories, similar results should emerge for other categories of respondents. The WVS dataset included a wide range of categories of participants, although not all samples were population samples. Model 4 tested the hypothesis of structural equivalence on non-student participants. A binary variable was inserted in the model at the second level to test whether sample bias due to random selection influenced the relationship between values and trust in institutions. In contrast to the other models, properties of the samples had an effect on the dependent variable in Model 4. In particular, sample size had a significant effect with larger samples having higher scores on the latent factor, but not the control for the population sample. A straightforward interpretation of this result may not be possible because

the sample size overlaps to some extent with economic conditions (i.e., larger samples are from low GDP countries, see Appendix 1). From this perspective, the significant effect of sample size replicates the effect of WISP.

In contrast to our expectations, six variance components out of ten slopes were significant in Model 4 (see Table 1). The negative interaction with WISP partially explained the cross-country variance of the slope of power and, only marginally, that of benevolence. A marginal negative interaction was also found between universalism and WGI. Country-level residual variances were significant at the  $p < .01$  level for all six random slopes, even after controlling for cross-country interactions.

As a further test, we compared Model 4 to an identical model in which residual variances of random slopes were constrained to zero. The likelihood ratio test ( $\chi^2 = 149.63$ ,

$df = 7, p < .001$ ) confirmed that Model 4 fitted the data better than the constrained model. Thus, the hypothesis of structural equivalence on non-student participants was rejected.

### *The Sinusoid Curve Hypothesis*

To test the sinusoid curve hypothesis (see explanations provided under The Present Research), regression coefficients of models with random slopes, but not second-level interactions, were graphed in Figure 2. For the Schwartz 1996 dataset, hedonism and stimulation had no effect on trust in institutions. Self-direction and universalism had negative relations to the level of trust, while the most positive relations were observed on tradition, conformity, and security, stressing the expected opposition between these two groups of values (Schwartz 1992). The Spearman rank correlation coefficient between regression coefficients and the theoretical pattern of relationships was  $r_s = .837, p < .001$ , which supported the sinusoid curve hypothesis.

In Spini 1996, there was again a clear opposition between tradition and self-direction or, more generally, between the importance of personal freedom and liberties on one side and values linked to social stability (tradition, conformity, and security) on the other side. Similarly to what was observed for the Schwartz 1996 dataset, hedonism and stimulation had a null relationship with the outcome variable. Results showed that regression coefficients of the values followed smoothly a regular pattern especially for social change and social stability. Spearman rank correlation coefficient between the theoretical and observed coefficients was  $r_s = .822, p < .001$ , which again supported the hypothesis.

For the student sample (WVS dataset), the pattern would follow the sinusoidal curve without hedonism, which scored higher than achievement, and security, that had an almost null relationship (whereas we predicted the strongest positive correlation) with trust in institutions. For the non-student sample, hedonism was lower than achievement but also than stimulation, and security had a null relationship with trust. Thus, regression coefficients had a very low and non significant positive correlation with the expected pattern,  $r_s = .307, n.s.$  for the student sample and  $r_s = .344, n.s.$  for the non-student sample.

## 4 Discussion

Based on these results, we can draw several important conclusions. First, the sinusoid curve hypothesis was confirmed for the first two samples, providing quite precise theory-based predictions of individual positions in relation to the dependent variable. For the WVS samples, correlations were weaker. Although the graph visually respects a sinusoid curve, the lack of support for the hypothesis may stem from the poorer measurement quality of the WVS measure of values. Overall, analyses confirmed with a certain degree of predictability that individuals relate to institutions on the basis of a pattern of personal and social values which follows Schwartz's (1992) theory. People oriented towards traditions, conformity, and security were more likely to trust

institutions. In contrast, giving priority to the self and autonomy was associated to low levels of confidence in institutions. The multilevel models showed that this pattern was quite stable across countries. Tests of structural equivalence across countries and across datasets produced results that supported the general hypothesis of structural equivalence.

In line with modernization theory (Inglehart and Welzel 2005), socio-economic and political development had a direct effect on trust in institutions and had a significant role in explaining variations in the relationship between values and trust in institutions. More precisely, in the WVS student sample, power and tradition had a positive relationship with trust for countries with low levels of social progress, but this relationship was negligible for countries with higher levels of social progress. Stimulation was negatively related to trust in institutions especially in more developed countries. Similar conclusions can be drawn for the overall WVS sample: values expressing social responsibility (benevolence and universalism) tended to be related to weaker support for institutions only in countries where living conditions were relatively comfortable.

The differences found between student and non-student datasets contrasted with the assumption that students express the same value orientations than overall populations (Schwartz 2006b). As we already discussed, in more heterogeneous samples, the relations between values and confidence in institutions became more unpredictable and between-country variance failed to be explained by the available socio-economic and political variables at the country level. However, it could be argued that these results may be linked to the measurement error of the WVS version of the PVQ, in which each value construct was assessed by a single item. Research by Morselli, Spini and Devos (2011) compared results between the Schwartz's values in the WVS and the European Social Survey (ESS). The 10-PVQ produced analogous results to the 21-PVQ in terms of size and signs of regression coefficients (but not for standard errors), suggesting that the measures of the WVS 10-PVQ can be compared to another values inventory, specifically the ESS 21-PVQ.

Another important issue is that some of the WVS countries have not the same data quality and sample parameter. Notably, in some developing countries, the data collections did not capture the overall stratification of the country, in terms of age, social classes, and education. This being said, the non-significant coefficient of the population sample variable suggests that differences between population and non-population samples could not explain the variance of trust in institutions at the country level. Thus, we are inclined to explain the results of Model 4 in terms of difference between the student and non-student populations, rather than differences between scales or sample bias.

## 5 Conclusions

The aim of the present research was to propose and illustrate an innovative way of using multilevel structural equation models to test specific hypotheses about the structural equivalence of human values (Schwartz 1992; Schwartz and



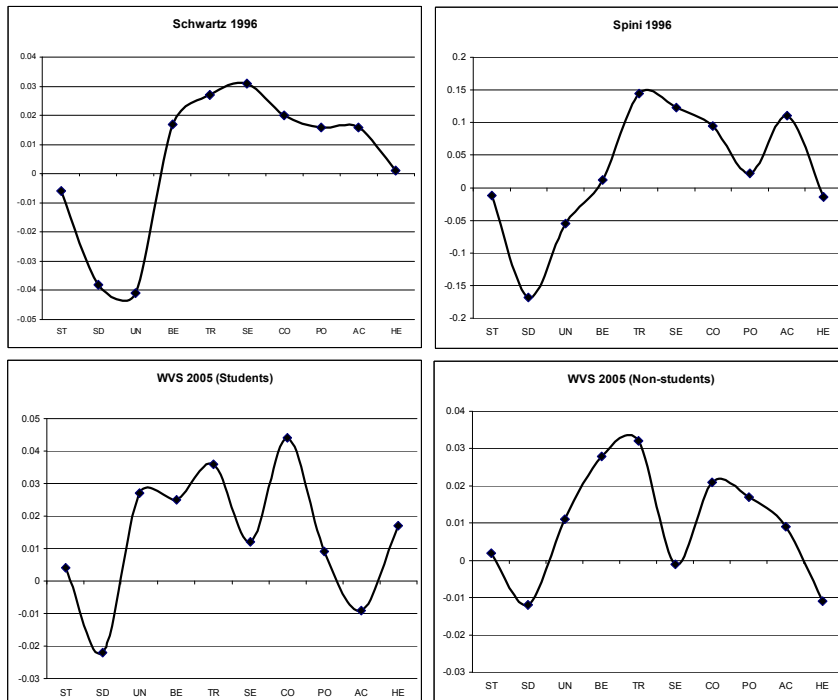


Figure 2. Unstandardized individual-level regression coefficients of trust in institutions on the ten values. Po = Power; Ac = Achievement; He = Hedonism; St = Stimulation; Sd = Selfdirection; Un = Universalism; Be = Benevolence; Tr = Tradition; Co = Conformity; Se = Security.

Bilsky 1990) and the relations between value priorities and other constructs of interest (e.g., trust in institutions) across countries. One limitation of the present work lies in the need to test more directly the internal circular structure of values. Integrating this test in the context of multilevel models with latent variables is an important and challenging task. At the same time, systematic separate tests of the internal circular structure have been undertaken using various methods (e.g., Davidov 2010; Davidov et al. 2008; Schmitt et al. 1995; Schwartz and Boehnke 2004; Steinmetz et al. 2009).

At the structural level, the results obtained showed that Schwartz's (1992) model is largely confirmed when we examine the structural equivalence across countries in several datasets. The relations between values and attitudes toward societal institutions are predictable on the basis of the circular model of values and invariant across countries in student samples. However, this conclusion did not hold for non-student samples. As in many research fields, relying on narrow student samples or cross-sectional studies may reduce the variance and limit conclusions that can be drawn based on tests of structural invariance (see also Sears 1986; Spini et al. 2008).

Our goal was to illustrate the suitability and flexibility of multilevel structural equation models to test systematically hypotheses regarding the equivalence of the value structure across countries, samples, and instruments. At this stage of the analyses, we cannot conclude, without qualifications, that the proposed model of values is universal (Norenzayan

and Heine 2005). However, by testing specific hypotheses regarding the structural equivalence of some findings, we paved the way for future investigations on the similarities and differences across cultural or national contexts in human values. The approach that we developed and used successfully here may lead to a more in depth understanding of how values are embedded in sociohistorical realities. Instead of providing a clear-cut answer to a model's universality, the conceptual and analytical approach we advocated for will be valuable to clarify and specify the elements of the theory that can be universal and those that are more a function of the socio-historical context.

In sum, multilevel models have great potentials for developing an integrated theory of values across disciplinary borders. They provide a framework that allows researchers to integrate bottom-up (psychological) vs. top-down (sociological) approaches, while simultaneously addressing methodological issues. A great strength of this data analysis strategy is the possibility to include variables measured at the individual (e.g., values, attitudes, etc.) and societal (e.g., socio-economic wealth, quality of governance) levels. Moreover, factoring characteristics of samples or measurement instruments provides an opportunity to integrate theoretical or substantive issues and methodological concerns in analyses of international survey data.

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## References

- Allum, N., Sturgis, P., & Read, S. (2010). Evaluating change in social and political trust in Europe using multiple group confirmatory factor analysis with structured means. In E. Davidov, J. Billiet, & P. Schmidt (Eds.), *Cross-cultural analysis: Methods and applications*. London: Routledge Academic.
- Berger, R. L., & Casella, G. (2002). *Statistical inference*. Australia: Thomson Learning.
- Billiet, J., & Meuleman, B. (2007, October). *Religious diversity in Europe and its relation to social attitudes and value orientations*. Paper presented at the Citizenship and cultural identities in the EU: old questions, new answers. International Conference. Retrieved December, 2010 from <http://www.csdiworkshop.org>.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Borg, I., & Shye, S. (1995). *Facet theory: Form and content*. Thousand Oaks: Sage Publications.
- Caricati, L. (2007). The relationship between social dominance orientation and gender: The mediating role of social values. *Sex Roles, 57*, 3-4.
- Cohrs, J. C., Kielmann, S., Maes, J., & Moschner, B. (2005). Effects of right-wing authoritarianism and threat from terrorism on restriction of civil liberties. *Analyses of Social Issues and Public Policy, 5*, 263-276.
- Coleman, J. S. (1990). *Foundations of social theory*. Cambridge, Mass: Belknap Press of Harvard University Press.
- Dahl, R. A. (1999). *The past and the future of democracy*. Occasional Papers series, 5, Centro Interdipartimentale di Ricerca sul Cambiamento Politico. Retrieved from <http://www.gips.unisi.it/circap>.
- Dalton, R. J. (2004). *Democratic challenges, democratic choices: the decline in political support in advanced industrial democracies*. Oxford: Oxford University Press.
- Davidov, E. (2010). Testing for comparability of human values across countries and time with the third round of the European Social Survey. *International Journal of Comparative Sociology, 51*, 171-191.
- Davidov, E., Schmidt, P., & Schwartz, S. H. (2008). Bringing values back in the adequacy of the European Social Survey to measure values in 20 countries. *Public Opinion Quarterly, 72*, 420-445.
- Devos, T., Spini, D., & Schwartz, S. H. (2002). Conflicts among human values and trust in institutions. *British Journal of Social Psychology, 41*, 481-494.
- Estes, R. J. (1997). The world social situation: social work's contribution to international development. In E. Richard (Ed.), *Encyclopedia of Social Work. Supplement to the 19th Edition* (p. 343-359). Washington: National Association of Social Workers.
- Fontaine, J. R. J., Poortinga, Y., Delbeke, L., & Schwartz, S. (2008). Structural equivalence of the values domain across cultures. *Journal of Cross-Cultural Psychology, 39*, 345-365.
- Hox, J. J. (2002). *Multilevel analysis: Techniques and applications*. Mahwah: Erlbaum.
- Inglehart, R. (1977). *The silent revolution: Changing values and political styles among western publics*. Princeton: Princeton University Press.
- Inglehart, R. (1999). Postmodernization erodes respect for authority, but increases support for democracy. In P. Norris (Ed.), *Critical citizens: Global support for democratic governance* (p. 236-257). Oxford: Oxford University Press.
- Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change, and democracy. The human development sequence*. New York: Cambridge University Press.
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2008). *Governance Matters VII: Governance Indicators for 1996-2007*. World Bank Policy Research Working Paper No. 4978.
- Klein, K. J., & Kozlowski, S. W. J. (2000). *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions*. San Francisco: Jossey-Bass.
- Kuşdil, M. E., & Şimşek, S. (2008). The importance of values in predicting Turkish youth's opinions about the European Union in light of the Copenhagen Political Criteria. *International Journal of Psychology, 43*, 988-996.
- Listhaug, O., & Wiberg, M. (1995). Confidence in political and private institutions. In H.-D. Klingemann & D. Fuchs (Eds.), *Citizens and the state* (p. 298-322). Oxford: Oxford University Press.
- Marsh, H. W., Ludtke, O., Robitzsch, A., Trautwein, U., Asparouhov, T., Muthén, B., et al. (2009). Doubly-Latent models of school contextual effects: Integrating multilevel and structural equation approaches to control measurement and sampling error. *Multivariate Behavioral Research, 44*, 764-802.
- Maslow, A. H. (1959). *New knowledge in human values*. New York: Harper.
- Meuleman, B., & Billiet, J. (2009). A Monte Carlo sample size study: How many countries are needed for accurate multilevel SEM? *Survey Research Methods, 3*, 45-58.
- Mishler, W., & Rose, R. (1997). Trust, distrust and scepticism: Popular evaluations of civil and political institutions in post-communist societies. *Journal of Politics, 59*, 418-451.
- Morselli, D., Spini, S., & Devos, T. (2011). *Schwartz's Theory on Human Values and Trust in Institutions: A Multilevel Test of Cross-Country Equivalence*. Paper presented at the Conference of the European Survey Research Association, Lausanne, Switzerland.
- Muthén, B. O. (1994). Multilevel covariance structure analysis. *Sociological Methods and Research, 22*, 376.
- Muthén, L. K., & Muthén, B. O. (1998-2010). *Mplus user's guide* (6th ed.). Los Angeles, CA: Muthén & Muthén.
- Muthén, L. K., & Muthén, B. O. (2002). How to use a Monte Carlo Study to decide on sample size and determine power. *Structural Equation Modeling, 9*, 599-620.
- Norenzayan, A., & Heine, S. J. (2005). Psychological universals: What are they and how can we know? *Psychological Bulletin, 31*, 763-784.
- Preacher, K. J., Zyphur, M. J., & Zhang, Z. (2010). A general multilevel SEM framework for assessing multilevel mediation. *Psychological Methods, 15*, 209-233.
- Roccas, S., Sagiv, L., Schwartz, S. H., Halevy, N., & Eidelson, R. (2008). Towards a unifying model of identification with groups:

- integrating theoretical perspectives. *Personality and Social Psychology Review*, 12, 280-306.
- Sagiv, L., & Schwartz, S. H. (1995). Value priorities and readiness for out-group social contact. *Journal of Personality and Social Psychology*, 69, 437-448.
- Schmitt, M. J., Schwartz, S. H., Steyer, R., & Schmitt, T. (1995). Measurement models for the Schwartz Values Inventory. *European Journal of Psychological Assessment*, 9, 107-121.
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25, p. 1-65). New York: Academic Press.
- Schwartz, S. H. (1994). Are there universal aspects in the content and structure of values? *Journal of Social Issues*, 50, 19-45.
- Schwartz, S. H. (2003). *A proposal for measuring value orientations across nations*. In the Questionnaire Development Package of the European Social Survey. Retrieved from <http://www.europeansocialsurvey.org>.
- Schwartz, S. H. (2004). Mapping and interpreting cultural differences around the world. In H. Vinken, J. Soeters, & P. Ester (Eds.), *Comparing cultures: Dimensions of cultures in a comparative perspective* (p. 43-73). Leiden: Brill.
- Schwartz, S. H. (2006a). A theory of cultural value orientations: Explication and applications. *Comparative Sociology*, 5, 137-182.
- Schwartz, S. H. (2006b). Value orientations: Measurement, antecedents and consequences across nations. In R. Jowell, C. Roberts, R. Fitzgerald, & G. Eva (Eds.), *Measuring attitudes cross-nationally. Lessons from the European Social Survey schwartz2006* (p. 161-193). London: Sage.
- Schwartz, S. H., & Bilsky, W. (1990). Toward a theory of the universal content and structure of values: Extensions and cross cultural replications. *Journal of Personality and Social Psychology*, 58, 878-891.
- Schwartz, S. H., & Boehnke, K. (2004). Evaluating the structure of human values with confirmatory factor analysis. *Journal of Research in Personality*, 38, 230-255.
- Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., & Harris, M. (2001). Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *Journal of Cross-Cultural Psychology*, 32, 519-542.
- Schyns, P., & Koop, C. (2010). Political distrust and social capital in Europe and the USA. *Social Indicators Research*, 96, 145-167.
- Sears, D. O. (1986). College sophomores in the laboratory: Influences of a narrow database on social psychology's view of human nature. *Journal of Personality and Social Psychology*, 51, 515-530.
- Spini, D. (1997). *Valeurs et représentations sociales des droits de l'homme: une approche structurale [Values and social representations of human rights: A structural approach]*. Doctoral dissertation. University of Geneva, Geneva, Switzerland.
- Spini, D. (1999). Une recherche internationale sur l'impact des valeurs: présentation des modèles d'équations structurales. In W. Doise, N. Dubois, & J.-L. Beauvois (Eds.), *La psychologie sociale: La construction sociale de la personne* (Vol. 4, p. 75-85). Grenoble: Presses Universitaires de Grenoble.
- Spini, D. (2003). Measurement equivalence of 10 values from the Schwartz value survey across 21 countries. *Journal of Cross-Cultural Psychology*, 34, 3-23.
- Spini, D., & Doise, W. (1998). Organizing principles of involvement in human rights and their social anchoring in value priorities. *European Journal of Social Psychology*, 28, 603-622.
- Spini, D., & Doise, W. (2005). Human rights and duties as normative social representations. In N. J. Finkel & F. Moghaddam (Eds.), *The psychology of human rights and duties: Empirical contributions and normative comments* (p. 21-48). Washington, DC: American Psychological Association.
- Spini, D., Elcherth, G., & Figini, D. (2008). Is there space for time in social psychology publications? A content analysis across five journals. *Journal of Community and Applied Social Psychology*, 19, 165-181.
- Steinmetz, H., Schmidt, P., Tina-Booh, A., Wieczorek, S., & Schwartz, S. H. (2009). Testing measurement invariance using multigroup CFA: Differences between educational groups in human values measurement. *Quality and Quantity*, 43, 599-616.
- van de Vijver, F. J. R., & Leung, K. (1997). *Methods and data analysis for crosscultural research*. Thousand Oaks: Sage Publications.
- Welzel, C. (2006). Democratization as an emancipative process: The neglected role of mass motivations. *European Journal of Political Research*, 45, 871-896.
- Zmerli, S., & Newton, K. (2008). Social trust and attitudes toward democracy. *Public Opinion Quarterly*, 72, 706-724.

## Appendix: Sample sizes by country

### *Schwartz 1996:*

Australia (n = 109), Belgium (n = 344), Brazil (n = 140), China (n = 208), Estonia (n = 284), Finland (n = 429), Germany (n = 617), Greece (n = 115), Hong Kong (n = 220), Hungary (n = 159), Israel (n = 239), Japan (n = 327), Netherlands (n = 216), Slovak Republic (n = 229), Switzerland (n = 264), Turkey (n = 242), U.S.A (n = 638), Zimbabwe (n = 168).

### *Spini 1996:*

Argentina (n = 226), Bulgaria (n = 210), Canada (n = 188), Chile (n = 129), Costa Rica (n = 99), Estonia (n = 210), Finland (n = 252), France (n = 181), India (n = 200), Israel (n = 293), Italy (n = 128), Ivory Coast (n = 195), Japan (n = 158), Mexico (n = 213), Philippines (n = 205), Portugal (n = 101), Senegal (n = 157), Serbia (n = 199), Switzerland (n = 182), U.K. (n = 115), Uganda (n = 197)

### *World Values Survey 2005, Students:*

Argentina (n = 40), Brazil (n = 44), Bulgaria (n = 27), Burkina Faso (n = 76), Chile (n = 47), Cyprus (n = 43), Ethiopia (n = 163), Finland (n = 54), Germany (n = 53), Ghana (n = 141), India (n = 157), Indonesia (n = 238), Iran (n = 157), Malaysia (n = 186), Mali (n = 75), Mexico (n = 51), Moldova (n = 61), Morocco (n = 34), Netherlands (n = 39), Peru (n = 102), Poland (n = 58), Romania (n = 27), Russia (n = 122), South Africa (n = 299), South Korea (n = 98), Serbia (n = 57), Slovenia (n = 58), Spain (n = 64), Sweden (n = 48), Taiwan (n = 43), Trinidad and Tobago (n = 29), Turkey (n = 84), U.K. (n = 35), Ukraine (n = 42), Vietnam (n = 23), Zambia (n = 156).

### *World Values Survey 2005, Non-students:*

Argentina (n = 475), Australia (n = 797), Brazil (n = 633), Bulgaria (n = 458), Burkina Faso (n = 557), Chile (n = 439), China (n = 683), Cyprus (n = 555), Ethiopia (n = 824), Finland (n = 499), France (n = 346), Germany (n = 772), Ghana (n = 731), India (n = 356), Indonesia (n = 1096), Iran (n = 1538), Japan (n = 334), Malaysia (n = 745), Mali (n = 619), Mexico (n = 541), Moldova (n = 548), Morocco (n = 605), Netherlands (n = 515), Peru (n = 583), Poland (n = 544), Romania (n = 810), Russia (n = 752), South Africa (n = 1871), South Korea (n = 730), Serbia (n = 725), Slovenia (n = 491), Spain (n = 787), Sweden (n = 534), Switzerland (n = 483), Taiwan (n = 729), Thailand (n = 1252), Trinidad and Tobago (n = 515), Turkey (n = 721), U.K. (n = 559), U.S.A. (n = 694), Ukraine (n = 322), Vietnam (n = 855), Zambia (n = 656).