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Does contextual change affect Basic Human Values? A dynamic comparative multilevel analysis across 32 European countries

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Abstract

This paper examines the relationship of stable contextual differences and contextual change with the endorsement of Schwartz's (1992) two basic value dimensions – Openness-to-Change vs. Conservation and Self-Enhancement vs. Self-Transcendence. Using six waves of the European Social Survey, an extension of multi-level analysis is employed which combines both a cross-national comparative and a dynamic analysis of values. The hierarchical data structure and the covariates for value endorsement are defined at three distinct levels: a first level for individuals (with socio-demographic variables, such as age and gender), a second level for country-waves (with time-varying covariates), and a third level for country (with time-invariant covariates). The main aim is to determine if changes in contextual covariates over time are related to value differences between countries over and above contextual time-invariant covariates.

High national wealth and low income inequality predicted high Self-Transcendence values and low Conservation values. Low national unemployment rates were associated with less conservatism. When entered simultaneously into the model, only time-invariant differences in GDP remained to be a significant predictor of Schwartz's two basic value dimensions. Finally, we found that an increase in income inequality over time has a certain incremental effect on the endorsement of Conservation over Openness-to-Change values. There were no associations for changes in national wealth and unemployment rates, suggesting that for value endorsement time-varying contextual effects are less important overall than time-invariant contextual effects.

1. Introduction

Values have been a crucial concept ever since the early beginnings of psychological research (see Allport & Vernon, 1931). They have been widely used to explain people's attitudes (e.g., Dobewall, & Rudnev, 2014; Vauclair et al., 2015), emotions (Sortheix & Lönnqvist, 2014; Roccas & McCauley, 2004), and behaviours (e.g., Fischer & Boer, 2015; Verplanken & Holland, 2002). Human values are commonly defined as *relatively stable*, desirable, transsituational motivational goals, which vary in their relative importance and serve as individuals' guiding principles in life (Schwartz, 1992). Previous research has mainly focused on examining socio-demographic variables as antecedents of individuals' value priorities (e.g., Hitlin & Piliavin, 2004; Schwartz, 2005). However, contextual variables may be just as important to consider in order to understand value priorities and their potential changes over time more thoroughly. For instance, some countries in the European Region have witnessed dramatic changes in their socio-economic climate during the past two decades and during the recent economic crisis, which could have altered individuals' value priorities. There is little research that has been conducted on this question (Hitlin & Piliavin, 2004) and those studies that did address this question show major methodological and conceptual limitations, that is, they examined antecedents of value change at a single level of analysis and did not take into account important covariates at other levels of analysis. Moreover, they did not clearly distinguish between attitudes and values (see Inglehart & Baker, 2000). In this paper we aim to fill the gap and overcome previous limitations by using a well-established value measure (Schwartz, 1992) and studying both individual-level (e.g., age or gender) and contextual-level factors (i.e., country-level characteristics and their change over time) as possible antecedents of value endorsement. Accounting for individual-level factors in the models is important because it controls for country-composition effects when analyzing contextual effects.

Moreover, previous cross-national research on value priorities has mainly focused on the role of context as a stable factor in explaining between-country differences in value priorities (Schwartz, 2006; Schwartz & Bardi, 1997). Hence, we address the question whether changes in the countries' contexts predict value preferences over and above relevant individual-level control variables as well as country-level factors that are time-invariant. This has important theoretical and practical implications for understanding how value priorities may change and contribute to differences between countries.

1.1 Basic Human Values

Schwartz (1992) developed one of the most prominent value theories and measures in psychology. Figure 1 shows the value structure and the ten distinct value types. In theory, individuals endorse value types that are located close to each other in this circumplex model because they are psychologically compatible in terms of their motivational goals. Values opposing each other in the structure are perceived as conflicting. Therefore, an individual who has a value hierarchy according to the proposed relationships among the ten value types endorses a set of adjacent values and rejects those values which oppose them in the value circle. The notion of value compatibilities and conflicts allows collapsing the ten value types into two basic dimensions (Schwartz, 2005; Strack & Dobewall, 2012). Using dimensions instead of the ten value types also guarantees more reliable and cross-culturally equivalent measures (Cieciuch, Davidov, Algesheimer, & Schmidt, 2016; Davidov, 2010; Knoppen & Saris, 2009).

Insert Figure 1 about here

The Openness-to-Change vs. Conservation dimension reflects whether individuals are prepared for new experiences and value independent action and thought, or whether people

oppose change and put emphasis on self-restriction and order. The Self-Enhancement vs. Self-Transcendence dimension identifies whether one is more motivated to promote own personal interests even at the expense of others, or whether one is motivated to go beyond selfish concerns and promote the welfare of others (Schwartz, 2005; Verkasalo et al., 2009).

1.2 Individual-level Antecedents of Values

There is cumulative evidence that formative experiences during cohort socialization[i] are crucial in life and leave an imprint on individuals (Inglehart & Baker, 2000; Sutin et al, 2013; Voigtländer & Voth, 2015). In this paper, we acknowledge that cohort is an important factor to consider when studying value change; however, based on the most recent evidence (Tormos, 2013), we propose that a change in the societal context can have an incremental effect on individuals' values beyond cohorts' formative years.

The question of how values change over the life cycle due to the effects of age has recently attracted some attention. Schwartz (2005) himself seems to attribute more importance to value change due to physical aging and stages of life than to differences in cohort formative experiences or period effects (i.e., changes at the contextual level). In a recent study by Dobewall and colleagues (2016) age turned out to be as important as cohort membership in explaining value change. These authors followed cohorts as they grew older and identified a pattern of value development that could apply to most individuals. They found that Self-Transcendence (vs. Self-Enhancement) values increase in young adulthood and that Conservation (vs. Openness-to-Change) values become more important over the life cycle. Even though there was some variation across European Regions, most individuals did not become more self-transcendent in middle and later adulthood.

Several other socio-demographic variables, such as, education and gender, have been

identified as antecedents of individuals' value priorities. Individuals who value Openness-to-Change over Conservation have usually higher levels of education (Verkasalo et al., 2009). Schwartz and Rubel (2005) found that Self-Enhancement and Openness-to-Change values are endorsed more by men while women score higher on Conservation and Self-Transcendence values. Other antecedents of values, such as, the community type in which people live, have been less explored. Yet, it has been suggested that individuals living in cities, as opposed to those living in smaller municipalities, become more often exposed to alternative worldviews (Draulans & Halman, 2003). Cities further provide a favorable environment for the expression and circulation of diverse interests and lifestyles (Wilson, 1985) which should stimulate Openness-to-Change values. Also employment status has been suggested to be important for people's values (Jahoda, 1981), maybe because Self-Enhancement vs. Self-Transcendence values relate to worries about both the self and its extensions (the personal risk of unemployment during an economic crisis) and the society at large (e.g., "unemployment in our country"; Schwartz, Sagiv, & Boehnke, 2000).

Therefore, we will consider education, gender, employment status, living in small vs. bigger municipalities, cohort socialization, and the effects of aging as individual level controls in our multilevel models.

1.3 Contextual Variables and Value Change

Although human values are usually found to be relatively stable (Bardi et al. 2014; Dobewall & Aavik, 2016), a number of theorists regard values as somewhat malleable by conceptualizing them as adaptations to the environment (McCrae & Costa, 1999; Schwartz & Bardi, 1997). Value priorities have been found to change when respondents go through major life transitions or events, such as, migration (Bardi et al., 2014; Rudnev, 2014) or war (Daniel et al., 2013). However, it seems that with time elapsing after such a major life transition or

traumatic event, rebound effects come into play (i.e., values return close to their baseline levels; Lönnqvist et al., 2013; Verkasalo et al., 2006). This evidence suggests that value changes triggered by external stimuli are likely to be temporary unless values are repeatedly challenged in the same direction (cf. Bardi & Goodwin, 2011). We argue that a change in the contextual characteristics of a country might fulfill this criterion. There is evidence that attitudes linked to modernization change parallel to countries' contextual change, and not only through the gradual process of cohort replacement (Tormos, 2013; Tormos 2012). However, to the best of our knowledge, this has not been studied to date in relation to Schwartz's value priorities. A thorough understanding of the evolution of values over time requires a comprehensive multilevel perspective that takes into account individual-level factors as well as stable and dynamic contextual factors (Fairbrother, 2014; Tormos, 2013). In the model described below, the stable contextual factors refer to *between* countries variation in values, while the dynamic one relate to *within*-country (over time) variation.

There are a number of stable contextual factors that have been found to be related to value priorities in a given society (for a review see Smith, Bond, & Kagitcibasi, 2006). One of the most studied contextual factors as a stable time-invariant variable is the socio-economic context (e.g., Schwartz, 2006; Inglehart and Baker, 2000; Vauclair & Fischer, 2011). Yet, the socio-economic context of a country is also somewhat dynamic, that is, it varies over time. A change in this kind of external stimuli may require some adaptation, which involves the restructuring of value preferences. If so, major societal shifts in the socio-economic context should correlate with value endorsement over time. We will focus on wealth, unemployment as well as national income inequality as contextual indicators that vary over time, which should be crucial variables given changes in the socio-economic climate in Europe during the past decade, especially in the event of the recent economic crisis.

There is cumulative evidence that specific value types correlate with the socio-economic development of a country. Based on previous research (e.g., Inglehart & Baker, 2000; Schwartz, 2006; Vauclair & Fischer, 2011), we expect that, other things held constant, people from wealthier countries endorse more open and self-transcendent values than people from poorer countries. Consequently, we hypothesized that:

H1a: *Between* countries, national wealth is related to higher Openness-to-Change and Self-Transcendence values.

H1b: A country's increase in wealth over time (*within* country effects) is associated with a greater endorsement of Openness-to-Change and Self-Transcendence values.

Some of the Schwartz' values represent deficiency needs (Self-Enhancement and Conservation values), that is, they express a desire for order and control to compensate for the experience of uncertainty or threat to ones' psychological, material, physical, or social welfare (Schwartz & Bardi, 1997; Schwartz et al., 2000). A national context that is characterized by high unemployment rates should foster the emphasis on Self-Enhancement and Conservation values. Hence, we hypothesized that:

H2a: Higher unemployment rates are related to higher Self-Enhancement and Conservation values.

H2b: When unemployment grows more emphasis will be put on Self-Enhancement and Conservation values.

Theorists on income inequality have argued that there is a greater orientation towards hierarchy and social dominance in unequal societies (Wilkinson & Pickett, 2009). There is also recent empirical evidence that lends support to this notion (Vauclair et al., 2015). From a socio-psychological point of view, inequality translates into highly hierarchical societies in

which the attainment of status (e.g., through personal success as represented by Achievement/Mastery values) becomes an important goal in a given society. People living in countries with higher income inequality can be expected to endorse Self-Enhancement values more than people residing in low inequality countries. Hence we propose that:

H3a: Higher income inequality is associated with higher Self-Enhancement values.

H3b: Increases in income inequality over time are related to a greater endorsement of Self-Enhancement values.

We also explored whether the second value dimension, Openness-to-Change vs. Conservation, is in any way related to stable differences and changes in income inequality.

Overall, we test whether the time-varying covariates explain variance in within-country value differences over and above the same time-invariant covariates between countries.

2. The dynamic comparative multilevel approach to studying value change

Next, we will describe how to implement a novel extension of multilevel analysis, which decomposes the comparative and longitudinal components to make the most of multiple waves of cross-sectional survey data coming from different countries. As noted above, it is of major importance to take into account the issue of change over time and the way in which country values depend on time-varying socio-economic factors. Fairbrother (2014) and Tormos (2013), independently, developed a technique to capture the effects of contextual factors that change over time and distinguish them from those which are time invariant within multilevel models. Their extension of multilevel analysis makes it possible to concurrently account for both countries' context (time-invariant; hypotheses H1a, H2a, and H3a) and contextual change (time-varying characteristics of countries; hypotheses H1b, H2b, and H3b) when using cross-sectional survey data from multiple countries and waves.

In data that incorporate multiple waves of comparative surveys, individuals ($_i$) can be nested into country-waves ($_{tj}$) as second-level units, this is, countries observed at different moments of time. Country-waves can be further nested within countries ($_j$) as a third level. Figure 2 portrays the multilevel structure of such data. Different countries are observed at different moments in time, consequently it is a panel of countries. However, it is not a panel of individuals, given that different individuals of each nation at a particular moment in time are observed in each period. A multilevel regression model of such data could be depicted with the following equation[ii]:

(1)

$$y_{itj} = \beta_0 + \beta_1 X_{itj} + \beta_2 Z_{tj} + v_j + u_{tj} + e_{itj}$$

where y_{itj} is the dependent variable of interest; β_0 is the random intercept; X_{itj} is the vector of individual level variables, and β_1 its corresponding coefficients; Z_{tj} is the vector of country-time variables (at second level) with β_2 coefficients; v_j is the random effect at the country level; u_{tj} is the random effect at the country-time level; and e_{itj} is the random effect at the individual level[iii].

In data from multiple countries and waves there are two types of potential contextual effects: 1) those linked to country characteristics that change over time, therefore time-varying; and 2) those related to country characteristics which are constant for each country over time, hence time-invariant. The former contextual effects would change both between countries and within countries over time, but the latter would only do so between countries. Time-varying contextual covariates are second level characteristics of country-wave units, and time-invariant covariates are third level characteristics of countries. The coefficient β_2 in equation 1 is incapable of capturing these twofold effects, yielding to a mixture of both (see Fairbrother,

2014). The transformation needed to distinguish between time-varying and time invariant contextual effects is presented in equation 2:

(2)

$$y_{itj} = \beta_0 + \beta_1 X_{itj} + \beta_2 (Z_{tj} - \bar{Z}_j) + \beta_3 \bar{Z}_j + v_j + u_{tj} + e_{itj}$$

In this new equation, the former vector of contextual covariates Z_{tj} is decomposed into $\bar{Z}_j$, which is the average of each covariate over time in each country, and $(Z_{tj} - \bar{Z}_j)$, which is the vector of the differences of each covariate with respect to their average over time. Both terms are uncorrelated by design, and can be included simultaneously in the regression to estimate time-varying (β_2) and time-invariant contextual effects (β_3).

This aspect of the analysis is crucial for a test of our hypotheses of value change. If changes in the time-varying contextual predictors are able to produce corresponding changes in values, we will gather support for the idea that Schwartz's values can shift in response to contextual changes and not just by age (cf. Schwartz, 2005) or cohort replacement (cf. Inglehart & Baker, 2000) effects. Furthermore, this is a more meaningful way to conceptualize the effects of time than using just linear or categorical period effects across countries. It incorporates the change in the exogenous factors directly into the models and allows for a better approximation of the mechanisms that drive the dynamics of our object of study. Additionally, the equation can comprise a variable for period (year dummies or a linear effect). Including a time term is necessary to detect if there is a trend affecting the dependent variable which is not well enough captured by the time-varying predictors.

There are two available options to construct the time-invariant $\bar{Z}_j$ and the time-varying $(Z_{tj} - \bar{Z}_j)$ contextual covariates. A first procedure, that could be called the "actual average" method, consists in obtaining data for the contextual covariates in survey waves in which the

dependent variable has been observed in each respective country, and then calculate both the $\bar{Z}_j$ and the $(Z_{tj} - \bar{Z}_j)$. Some countries are exhaustively surveyed across each successive wave, however, there are nations surveyed on fewer occasions. In countries observed in just one instance, there would neither be variation in the dependent variable over time nor in the contextual covariates. In these cases: $\bar{Z}_j = Z_{tj}$, and $(Z_{tj} - \bar{Z}_j) = 0$. Therefore, this procedure should be restricted to operate with data from nations surveyed at least twice. There is an additional drawback of this approach: the pattern of missing countries across waves might not be random. This could introduce bias in the estimates, for instance, in the calculation of $\bar{Z}_j$. Wealthier countries might have more chances to be exhaustively surveyed across all waves, while less wealthy nations might be present more likely on recent waves. The calculation of $\bar{Z}_j$ might penalize wealthier countries surveyed across all waves, given that the observations at the beginning of the time series might drag their mean downwards. Conversely, poorer countries observed in more recent times could seem in a better situation on average, as only the recent and better off moments are considered to calculate $\bar{Z}_j$. The "actual average" method has been employed in Fairbrother (2014), Schmidt-Catran and Fairbrother (2016), and Tormos (2013).

A second procedure, that we coin the "theoretical average" method, can overcome the problems of the "actual average" approach. It consists in using all the available data from the contextual covariates in the time points coinciding with all possible survey waves (e.g. six time points in the case of the ESS), irrespective of whether a given country has been actually surveyed in all those survey waves. The $\bar{Z}_j$ is then constructed by averaging all the observations of the contextual variables in the all (theoretically) possible survey waves for each country[iv]. The $(Z_{tj} - \bar{Z}_j)$ is now calculated by subtracting the values of Z_{tj} that coincide with the survey wave in which each country has been actually surveyed to the value of the

new, "theoretical", $\bar{Z}_j$. This way of calculating $\bar{Z}_j$ and $(Z_{tj} - \bar{Z}_J)$ could compensate potential biases in missing country-cases across waves, given that it uses all the available information of the contextual covariates for each country. Following the previous example, contextual data from all potential survey waves will be now employed to construct the time-invariant covariates of less wealthy countries, not only the waves in which they were able to participate (which tend to coincide with the moments in which they appear better off). Furthermore, this procedure allows the inclusion of countries only surveyed once, because now in this cases: $\bar{Z}_j \neq Z_{tj}$ and $(Z_{tj} - \bar{Z}_j) \neq 0$.[v]

In our analysis, we present the results using the "theoretical average" approach, although we have replicated the models using the "actual average" procedure obtaining similar results. Working with "theoretical averages" allows us to include the country-case of Luxembourg, where the dependent variable is only observed in one survey wave.

3. Methods

3.1 Data

Research material is the repeated cross-sections of 32 countries that participated in the first six waves of the European Social Survey (ESS) (2002-2013), resulting in 152 country-wave units. A list of countries and the respective ESS waves of participation can be found in the Appendix (Table A3). The ESS is a bi-annual representative survey with rigorous methodological standards. Detailed information on response rates, the fieldwork, and respondents' socio-demographic characteristics can be found on the ESS website[vi]. The total sample size was 274,292[vii].

3.2 Criterion variable

Respondents' answered the 21-item version of the Portrait Values Questionnaire (PVQ; e.g., Schwartz, 2005). As measures of Basic Human Values we used the ipsative solution described in Strack and Dobewall (2012) to produce two basic value dimensions–Openness-to-Change vs. Conservation and Self-Enhancement vs. Self-Transcendence. High scores on these scales mean that conservative or self-transcendent values are more important than open-to-change or self-enhancing values, respectively. We excluded those respondents with more than three missing PVQ items (cf. Schwartz, 2005; other missing PVQ items were substituted with zero).

3.2 Individual-level control variables

Historical cohorts. The used cohort variable has five values (born before 1940; 1941-1953; 1954-1964; 1965-1976; and born 1977 and later), relating to historical changes across all European regions (see van Herk & Poortinga, 2012).

Age centered. There is a long-standing interest of social scientists in disentangling the effects of age, period (understood as changing contextual characteristics and/or linear passage of time), and cohort (Mason et al., 1973). Unfortunately, the three variables are confounded (age = period – cohort) in the data. Mishler and Rose (2007) proposed a within-cohort age variable to avoid the problem of multicollinearity between age, period, and cohort effects by eliminating the correlation between the cohort categories and chronological age. It assesses effects of aging by assigning to each respondent the relative location within his/her (historical) cohort. For instance, a respondent born in 1982 has the within-cohort age of 10 when interviewed in ESS2 and the value 16 when surveyed in ESS5. All cohorts but the oldest one has a maximum within-cohort age in the range of 22 to 24 years. The 1940 and

earlier cohort, due to the inclusion of very old respondents, had an aging span of up to 44 years. After the transformation, age centered and the cohort categories were orthogonal, enabling us to test whether period effects explain variance in personal values over and above the joint effects of age and cohort.

Education was assessed by the International Standard Classification of Education variable (ISCED)[viii], which has five categories (with higher categories indicating higher education): ISCED 0-1 (used as reference), ISCED 2, ISCED 3, ISCED 4, and ISCED 5-6.

Employment status with three categories: employed, unemployed, and not in the labor force (used as reference).

Gender was dummy coded (male = 1; female=0).

Community type. In order to account for differences in community type compositions across European countries, we computed dummy variables for respondents living in country villages, towns, suburbs, or big cities.

3.3 Contextual characteristics of countries (time-invariant, 3rd level)

GDP per capita. Per capita Gross Domestic Product (GDP) was employed to assess the differences in economic development between the ESS countries.[ix] We used GDP with a logarithmic transformation and not the actual GDP because it is useful for skewed data with a long tail towards the high values.

Gini coefficient. Countries' level of income inequality was assessed by the Gini coefficient.[x]

Unemployment rates were measured by the respective percentage of the total labor force.[xi]

3.4 Longitudinal change in contexts (time-varying, 2nd level)

Wave of survey. This variable investigates (linear) change from the first (2002/2003) to the

sixth wave (2012/2013) of the ESS.

Three time-varying measures (matching the respective country-waves) were used for these contexts: a decrease or increase in the GDP per capita, the evolution of income inequality levels, and the change in the unemployment rate. Whenever these time-varying predictors show a positive or negative sign they reflect a period of increase or decrease respectively in relation to the country average across ESS waves. Missing data was filled with data from adjacent years, whilst preference was given to more recent information.

We use the "theoretical average" procedure to calculate both the time invariant, $\bar{Z}_j$, and the time varying covariates, $(Z - \bar{Z})_{tj}$ at the contextual levels. By having these two types of contextual predictors, time-varying at the second level of country-waves and time-invariant at the third level of country, we are able to capture both constant differences over time between countries as well as the effects of a dynamic change within country contexts.

4. Results and discussion

We tested a sequence of multilevel models which predict the endorsement of values on Schwartz's (1992) two basic dimensions – Openness-to-Change vs. Conservation and Self-Enhancement vs. Self-Transcendence. Model 1 describes the empty model, which attributes the variance in values solely to the clustering of the data into countries and country-waves. This model is used as a reference to calculate the change in deviance for Models 2 and 3. Model 2 adds the individual level effects of cohort membership and age (centered), and period effects as measured by the wave of survey variable. Here we followed the strategy employed by Mishler and Rose (2007) for the study of age, period, and cohort effects in one country, but extending it for the study of multiple countries[xii]. Model 3 includes additional socio-demographic variables as individual-level controls. The inclusion of this set of

sociodemographic predictors at the individual level allows us to control for composition effects in the samples drawn from diverse European countries. It should be noted that linear period effects were not included in Model 3, because it serves as a reference for calculating the change in deviance for Models 4 to 7. In the models that followed (Models 4 to 6), the contextual covariates—GDP (log), income inequality (GINI coefficient), and national unemployment rates—were included in a stepwise fashion: each contextual factor was introduced separately but both in its time-invariant and time-varying versions. In Model 7 the three contextual factors were included simultaneously, again, as stable and dynamic contextual predictors. These models include the linear passage of time (i.e., period effects) as a control variable at the country-wave level to guarantee that the time-varying effects of the different predictors are not due to a spurious common time trend in the data (cf. Schmidt-Catran, 2016). Statistical analyses were conducted using IBM SPSS version 23.0 and design weights as provided by the ESS were used for all calculations[xiii].

4.1. Self-Enhancement vs. Self-Transcendence values

Table 1 presents the multilevel models for Self-Enhancement vs. Self-Transcendence values. As shown by the intra-class correlations of the empty model (Model 1), 11.9 percent of the variance in self-transcendent values was at the level of country, and 1.3 percent at the level of country-waves. Therefore, the most relevant degree of contextual variation takes place between countries and not within them, already speaking in favor of the stability of Schwartz's values in face of changes in the contextual conditions. Model 2 showed statistically significant effects for all historical cohorts. The older the historical cohort, the more did individuals in this cohort value Self-Transcendence. Age, independent of the cohort the individual belongs to, was positively associated with Self-Transcendence as well. Each year of age implied an increase in Self-Transcendence of 0.012. On average across the ESS

countries, age and cohort worked in the same direction: the older the individuals, the more self-transcending were their values. Controlling for wave of survey did not have a significant effect on the endorsement of Self-Transcendence vales. Thus, the inclusion of age and cohort implied a substantial reduction in the model's deviance with respect to the empty model (20,856.5 units, or a 2.8% reduction). This means that the combination of age and cohort is very relevant in explaining the variance of Self-Transcendence values. It is therefore relevant to control for the joint influence of these factors in the subsequent models.

Model 3 indicated that men valued Self-Transcendence less than women. Higher educational levels were related to higher Self-Transcendence values, although those with the highest education (ISCED 5-6) were a little less self-transcendent than the previous group (ISCED 4). Those who are not in the labor force held slightly more self-transcendent values than both the employed and unemployed respondents (in this order). Living in big cities and being in the labor force reduced Self-Transcendence values. It is noteworthy that these controls do not alter the effects that age and/or cohort have on values. The reduction in deviance with respect to the empty model was now 31.570.2 (4.3%).

Model 4 indicates that wealthier countries tend to have higher levels of self-transcendent values. However, whether countries have seen increases/reductions in their levels of wealth over time did not significantly relate to their levels of Self-Transcendence values. The intra-class correlation shrinked to half its value with respect to Model 3 (now 6.5 percent), meaning that we were able to explain a considerable degree of between-country variance. Yet, time-varying GDP per capita and a linear time trend explain little of the change within nations over time (i.e., within-country variance).

Model 5 shows that only the time invariant effect of income inequality had a statistically significant effect on self-transcendent values. The countries with higher income inequality

tend to have lower levels of Self-Transcendence. The increase over time in income inequality within-countries did not have statistically significant effects. When both time-invariant and time-varying inequality levels were taken into consideration, the coefficient for period effects showed a slightly significant impact indicating the presence of a negative time trend; suggesting that the more recent the ESS wave, the less Self-Transcendence was valued. The model's deviance with respect to Model 3 (a model with no contextual covariates) showed that Model 5 did not fit the data notably better. This specification only reduced country level ICC two percent points (now being 10.5%).

In Model 6, again, only the time-invariant version of the contextual covariate had a statistically significant effect, in that way that higher national unemployment rates were related to less self-transcendent and more self-enhancing values between countries. The increase in unemployment within-countries over time, on the contrary, did not have an effect on values. At the same time, the linear passage of time was also in this model related to Self-Enhancement values. The model's deviance with respect to the model with no contextual covariates (Model 3) did not improve notably.

Model 7 shows that when all contextual predictors are specified concurrently (see Appendix for Pearson correlations at the country (Table A2) and country-wave levels (Table A4)), only the time-invariant effect of the GDP per capita (log) had a sizeable impact on Self-Transcendence values. The reduction in deviance resulting from the inclusion of all contextual covariates is lower than that of Model 4 (including only the time-invariant and time-varying versions of GDP together with a linear trend), suggesting that this more parsimonious model describes the Self-Transcendence data better than complex Model 7.

Insert Table 1 about here

4.2 Openness-to-Change vs. Conservation values

The patterns detected on the Openness-to-Change vs. Conservation dimension were comparable in many respects, though with some particularities which are worth mentioning (Table 2). In the empty model (Model 1), the intra-class correlation for the country and the country-wave clustering are similar to the Self-Enhancement vs. Self-Transcendence dimension (11.4 and 0.6% respectively). In Model 2, the reduction in the model's deviance when age (centered) and cohort effects were included was fairly large (a 7.4% reduction), indicating that Conservation values are deeply related to the combination of age and cohort influences[xiv]. Wide differences among historical cohorts indicated that the younger the cohort, the more individuals in this cohort endorsed open values. But also age effects (b = 0.021), were twice as strong compared to the previous value dimension: the older the individual became, the more s/he endorsed Conservation values. The negative coefficient for linear period effects indicated a slight trend of reduction in conservative values over time.

It was possible to observe a slight reduction in differences between historical cohorts when individual level characteristics were considered (Model 3). This situation points to the presence of certain composition effects affecting cohorts. Cohorts were not only potentially different because of the formative experiences they had, but also as a result of a slightly dissimilar socio-demographic composition (e.g., only few individuals born early in the last century have achieved highest levels of education). On the other hand, age effects were not influenced by the controls in this model. In general terms, being male, having been more years in the educational system, being in the labor force, and living in larger municipalities reduced Conservation values in favor of Openness-to-Change values.

Wealthier countries had lower levels of Conservation (Model 4). However, the increase in wealth over time was not related to conservative values. Linear period effects continued to

have a statistical impact once included together with changes in country's affluence over time. The reduction in the model's deviance was the highest when compared to the other models with just one contextual covariate. The intraclass correlation of the country cluster was substantially reduced to 6.1%. The intraclass correlation of the country-waves was 0.5%.

Countries with higher levels of income inequality scored higher on Conservation values (Model 5). The increase in inequality within-countries over time was also related to the increase in conservative values. The model also indicated the presence of a negative time trend not captured by the time-varying covariate. The reduction in the intraclass correlation of country-waves was higher than for Models 4, 6 and 7: now being 0.4%.

Model 6 showed, at odds with expectations, that countries with larger levels of unemployment did not have higher levels of Conservations values. Also changes in unemployment levels within-countries over time were not related to conservatism. Again, a significant negative time trend emerged not covered by the time-varying covariate. The reduction in the intraclass correlation of the country clustering was larger than that of income inequality; though lower than that of country's wealth.

Model 7 again included all contextual covariates simultaneously. Out of the three time-invariant contextual predictors, only country's level of affluence continued to have a statistically significant effect. Regarding the dynamic dimension, the only contextual covariate that continued to have an impact was the changes in income inequality within-countries over time. Thus, only the time-varying effect of income inequality had an effect on Conservation values over and above time invariant cultural differences in GDP. This finding has the implication that people did not increase in conservative values due to the effect of the recent economic crisis per se, but rather due to a perceived increase in income inequality.

Insert Table 2 about here

4.3 The unique influence of time-invariant and time-varying contextual factors

After controlling for individuals' demographics (including age/cohort membership), all three *time invariant* characteristics of countries (i.e., high wealth, low income inequality, and low unemployment rates) predicted high Self-Transcendence values, when entered separately into the models. Further, national wealth and low income inequality, but not higher unemployment rates, correlated with higher levels of Conservations values. This supports H1a and the extant literature on socio-economic development-values linkages (Inglehart & Baker, 2000; Schwartz, 2006; Vauclair & Fischer, 2011). Context characterized by high unemployment rates, indeed, foster Schwartz' values that represent deficiency needs (Self-Enhancement values; Schwartz & Bardi, 1997; Schwartz et al., 2000), partially supporting H2a. Unequal societies, in line with H3a, seem to provide a favorable context for valuing hierarchy and social dominance (Self-Enhancement; Vauclair et al., 2014; Wilkinson & Pickett, 2009) but also conservatism. However, when entered simultaneously into the model only GDP per capita remained a significant predictor of value priorities. This supports the widely shared notion that a country's affluence is the main contextual antecedent of value priorities (Inglehart & Baker, 2000; Schwartz, 2006; Schwartz & Bardi, 1997; Smith et al., 2006; Vauclair & Fischer, 2011).

The presented set of analyses provided weak support for our main claim of substantial and systematic associations between contextual change and the evolution of values. On the Self-Transcendence vs. Self-Enhancement dimension, we did not find any evidence that changes in the three contextual covariates over time are related to value differences between countries over and above contextual time-invariant covariates. The finding that changes in income inequality does not affect people's value preferences on the Self-Enhancement vs. Self-

transcendence dimension parallels related work by Fairbrother and Martin (2013), who found that changes in income inequality did not erode social trust. On the Openness-to-Change vs. Conservation dimension, cultural values change was not associated with whether wealth or unemployment rates changed within a given country. Increases in income inequality, however, were indeed associated with higher Conservation and lower Openness-to-Change values, while decreases in income inequality were associated with lower Conservation and higher Openness-to-Change values. We did not formulate a hypothesis regarding the direction of the effects of change in income inequality and Conservative values. A change in the national level of income inequality might be more difficult to perceive than a change in unemployment levels or GDP per capita. If so, inequality is a fairly direct and difficult to grasp condition of a society, but with meandering and pervasive effects (Wilkinson & Pickett, 2009). Therefore, it is a striking finding that changes in the national inequality levels might foster a direct restructuring of value preferences. It is unlikely that there will be less inequality in our societies in the future decades (Piketty, 2014). Especially countries of the European Union reacted with austerity measures to the economic crisis of the past years, which are likely to increase income inequalities (and unemployment rates) even further. Our findings allow speculating that future increases in income inequality will drive people towards more conservative values and away from open orientations but they should be treated as tentative as multiple analyses were conducted and significant effects were found only for a single time-varying contextual factor.

We found that contextual effects are limited with respect to Schwartz's values (country variance was about 12 percent; variance attributable to country-waves was slightly above 1 percent), which is not the same for competing values models. Fischer and Schwartz (2011), for instance, showed that, on average, country differences accounted for about 22 percent of

the variance in the Likert-scaled items used to produce Inglehart and Baker's (2000) attitudinal dimensions. We argue that if overall contextual effects are modest, then dynamic contextual effects are even more modest (according to the ICCs presented above).

Finally, from ESS wave 1 to wave 6 the average European valued Self-Transcendence (Models 5 and 6) and Openness-to-Change as increasingly less important (except for complex Model 7). The negative effect of period on people's self-transcendent values were only significant if GDP time-invariant was not included into the models, which indicates that increases in wealth and the passage of time explained the same part of the variance in this value dimension (see Inglehart & Baker, 2000). As the inclusion of a time term, which is identical for all countries, detected trends affecting people's values that was not well enough captured by the country specific time-varying contextual factors, our findings might also explain to some degree the common observation that cultural values change slightly over time whilst the relative differences between countries remain (cf. Smith et al., 2006).

4.4 Limitations, strength, and conclusions

Our study has a number of limitations. We did not examine individuals' value change directly. When inspecting the equations of regular multilevel regressions as well as the dynamic comparative approach, one can see that individual-level predictors (e.g., age or education) have an effect on individual-level dependent variables (Schwartz' value dimensions in our case), while contextual predictors (both time invariant and time-varying contextual characteristics of countries) have an effect on the intercept. Intercepts are contextual aggregates of the individual level dependent variable (Fairbrother, 2014; Schmidt-Catran & Fairbrother, 2016). And thus the reported associations between dynamic contextual change and the evolution of value priorities should be interpreted as cultural value change and not individuals' value change.

The ten-year period of observations included in the current data may be at the limit of what is desirable, therefore, restricting the capacity to separate age from cohort effects and to make subsequent inferences. Nevertheless, it was possible to examine how cultural value change is predicted by contextual characteristics – both stable and dynamic ones.

We lost a sizeable amount of information when examining the higher order dimensions of values. It is left for future work to test the effect of contextual change on the ten specific value types of Schwartz's (1992) theory. Note that the use of aggregates of the two basic individual level value dimensions – Openness-to-Change vs. Conservation and Self-Enhancement vs. Self-Transcendence – is not consistent with the distinction of Schwartz's (2006) three cultural value dimensions, as the cultural value dimension Harmony vs. Mastery has no equivalent at the individual level (Schwartz, 2010). Nevertheless, previous work has shown that there is substantial similarity in the individual-level value structure across levels of analyses (Fischer, Vauclair, Fontaine, & Schwartz, 2010).

Our study also has a number of strengths. What is of supreme importance is that the estimates from the presented multilevel regression are more reliable than those of an aggregate (i.e., culture level) regression, given that we are controlling for a country's composition regarding the individual level covariates.

We presented an improvement of Fairbrother's (2014) and Tormos's (2013) technique to capture the effects of time-varying context by using the "theoretical averages" to measure time invariant characteristics of countries, which has the advantage that countries observed in just one instance can be included in the study and that it accounts for the fact that the pattern of missing countries across waves is rarely random.

We conclude that although individual characteristics are the main source of variance in

Schwartz's values, contextual factors have their relevance and should no longer be neglected by value researchers. In general, time-invariant contextual effects seem to matter more for people's values endorsement than change in their environment. That values are not so much related to time-varying contextual factors might be because, after all, values are relatively stable psychological constructs (Schwartz, 1992). They can develop differently as a function of the environment (i.e., variation in cohorts' formative experiences between countries), but do not change strongly when the environment changes (i.e., systematic variation within a context over a limited period of time).

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Figure Captions

Figure 1. The two basic dimensions of the Schwartz value theory: Ten basic values and the motivational goals defining them.

Note. Adapted with permission.

Figure 2. Multilevel structure of comparative longitudinal survey data.

Figure 1)

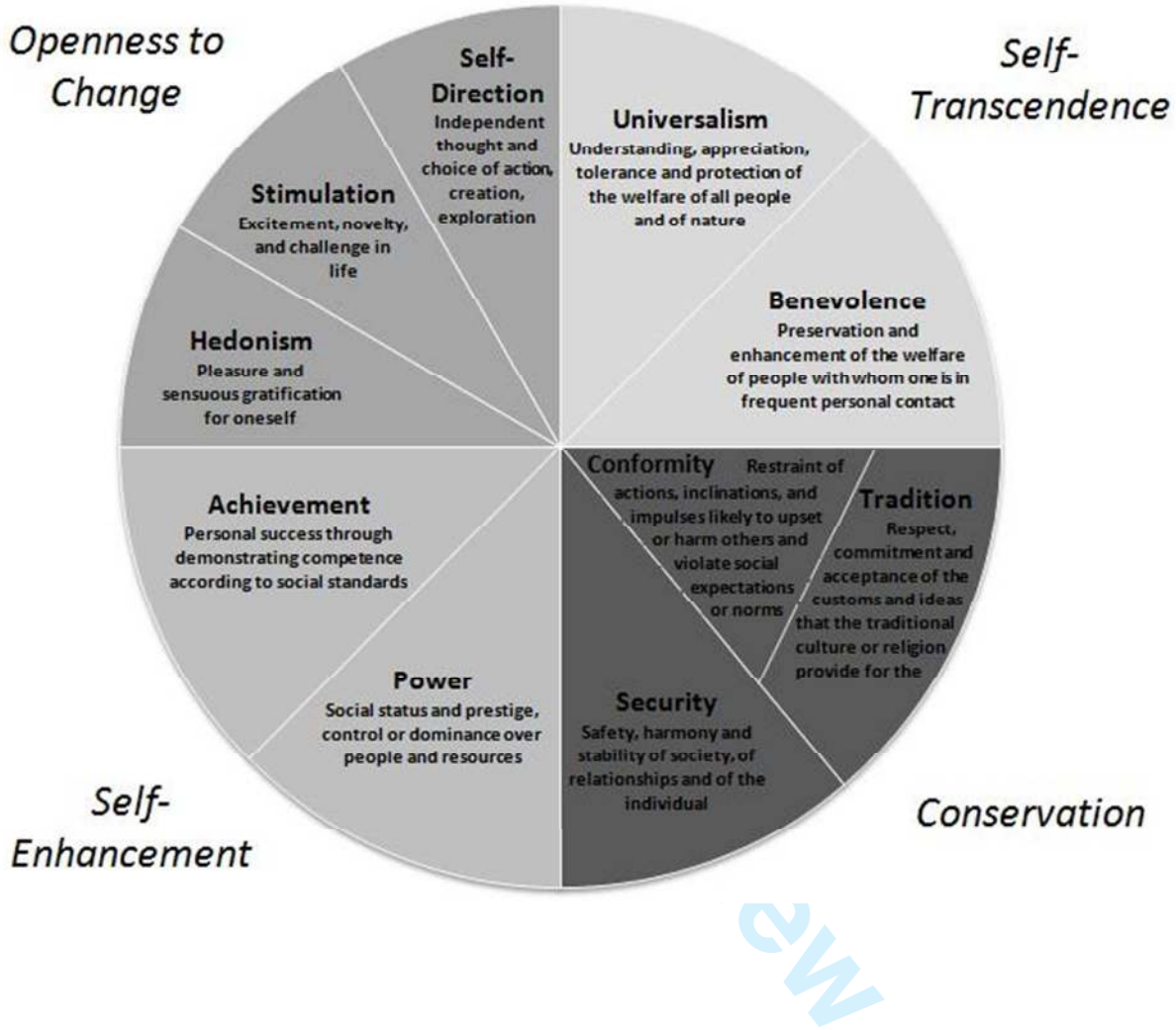
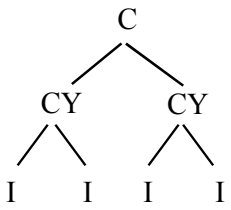

Openness to Change
Self-Transcendence
Self-Enhancement
Conservation
Self-Direction
Independent thought and choice of action, creation, exploration
Stimulation
Excitement, novelty, and challenge in life
Hedonism
Pleasure and sensuous gratification for oneself
Universalism
Understanding, appreciation, tolerance and protection of the welfare of all people and of nature
Benevolence
Preservation and enhancement of the welfare of people with whom one is in frequent personal contact
Conformity
Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms
Tradition
Respect, commitment and acceptance of the customs and ideas that the traditional culture or religion provide for the
Security
Safety, harmony and stability of society, of relationships and of the individual
Power
Social status and prestige, control or dominance over people and resources
Achievement
Personal success through demonstrating competence according to social standards

Figure 2)



Note. Figure adapted with permission from "The random effects in multilevel models: Getting them wrong and getting them right", by A.W. Schmidt-Catran and M. Fairbrother, 2016, *European Sociological Review*, 32, model D in Table 1. Copyright 2016 by Oxford University Press. C = country-level random effects, CY = country-year-level random effects, I = individual level.

Table 1. Multilevel Models on Self-Enhancement vs. Self-Transcendence Nesting Individuals in Country-Waves, and then in Countries.

		Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
Estimates of fixed effects		Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
	Intercept	0.086	0.061	-0.351 **	0.063	-0.323 **	0.061	-3.171 **	0.511	0.761 *	0.365	0.011	0.166	-2.723 **	0.804
Level 1	*Generation*														
Individuals	1940 and earlier			0.593 **	0.006	0.577 **	0.006	0.576 **	0.006	0.576 **	0.006	0.576 **	0.006	0.576 **	0.006
	1941-53			0.532 **	0.005	0.531 **	0.005	0.531 **	0.005	0.531 **	0.005	0.531 **	0.005	0.531 **	0.005
	1954-64			0.421 **	0.005	0.436 **	0.005	0.436 **	0.005	0.436 **	0.005	0.436 **	0.005	0.436 **	0.005
	1965-76			0.245 **	0.005	0.256 **	0.005	0.256 **	0.005	0.256 **	0.005	0.256 **	0.005	0.256 **	0.005
	1977-later			(ref.)		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
	Age centered			0.012 **	0.000	0.012 **	0.000	0.012 **	0.000	0.012 **	0.000	0.012 **	0.000	0.012 **	0.000
	Gender					-0.289 **	0.003	-0.289 **	0.003	-0.289 **	0.003	-0.289 **	0.003	-0.289 **	0.003
	Education														
	ISCED 0-1					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
	ISCED 2					0.098 **	0.007	0.098 **	0.007	0.098 **	0.007	0.098 **	0.007	0.098 **	0.007
	ISCED 3					0.143 **	0.006	0.143 **	0.006	0.143 **	0.006	0.143 **	0.006	0.143 **	0.006
	ISCED 4					0.172 **	0.011	0.172 **	0.011	0.172 **	0.011	0.172 **	0.011	0.172 **	0.011
	ISCED 5-6					0.139 **	0.007	0.140 **	0.007	0.139 **	0.007	0.139 **	0.007	0.139 **	0.007
	Employment status														
	Employed					-0.027 **	0.008	-0.027 **	0.008	-0.026 **	0.008	-0.027 **	0.008	-0.027 **	0.008
	Unemployed					-0.094 **	0.004	-0.095 **	0.004	-0.095 **	0.004	-0.095 **	0.004	-0.095 **	0.004
	Not in labor force					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
	Community type														
	Big city					-0.033 **	0.005	-0.033 **	0.005	-0.033 **	0.005	-0.033 **	0.005	-0.033 **	0.005
	Suburbs					-0.011	0.006	-0.011	0.006	-0.011	0.006	-0.011	0.006	-0.011 **	0.006
	Town					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
	Country village					0.026 **	0.004	0.026 **	0.004	0.026 **	0.004	0.026 **	0.004	0.026 **	0.004
	Farm					0.071 **	0.008	0.071 **	0.008	0.071 **	0.008	0.071 **	0.008	0.071 **	0.008

Level 2	*Time varying*																						
Country-waves	GDP (log)									-0.107		0.058								-0.105		0.071	
	Gini coefficient													0.013		0.010				0.012		0.010	
	Unemployment																	0.003		0.004	-0.001		0.005
	Wave of survey			-0.010		0.006				0.002		0.009	-0.012	*	0.006	-0.013	*	0.006	0.001		0.011		
Level 3	*Time invariant*																						
Countries	GDP (log)									0.284	**	0.051								0.279	**	0.061	
	Gini coefficient												-0.035	**	0.012					-0.017		0.010	
	Unemployment															-0.035		0.019		0.015		0.016	
Estimates of covariance parameters																							
Residual		0.851	**	0.002	0.796	**	0.002	0.771	**	0.002	0.771	**	0.002	0.771	**	0.002	0.771	**	0.002	0.771	**	0.002	
Intercept (country)		0.117	**	0.031	0.109	**	0.029	0.114	**	0.030	0.054	**	0.015	0.092	**	0.025	0.104	**	0.028	0.052	**	0.015	
Intercept (country*country-waves)		0.013	**	0.002	0.012	**	0.002	0.012	**	0.002	0.011	**	0.002	0.011	**	0.002	0.012	**	0.002	0.011	**	0.002	
Model comparisons																							
ICC (ρ): country		11.9	%		11.9	%		12.7	%		6.5	%		10.5	%		11.7	%		6.2	%		
ICC (ρ): country*country-waves		1.3	%		1.3	%		1.3	%		1.4	%		1.3	%		1.3	%		1.4	%		
Number of parameters		4			10			20			23			23			23			27			
Deviance		739666.1			718809.6			708095.9			708082.0			708105.4			708111.5			708107.4			
χ^2 Model improv. (prev. model)†					20856.5	**		31570.2	**		13.9	**		-9.5	**		-15.6	**		-11.5	**		
AIC		739672.1			718815.6			708101.9			708088.0			708111.4			708117.5			708113.4			
N																							
Individuals		274292																					
Country-waves		152																					
Countries		32																					

† To calculate the χ^2 for model improvement, the deviance used as reference in models 2 and 3 is that of the empty model (model 1). Models 4 to 7 used deviance from model 3 as reference.

Significance: ***p<0.01; **p<0.05.

Table 2. Multilevel Model on Openness-to-Change vs. Conservation. Nesting Individuals in Country-Waves, and then in Countries.

		Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
Estimates of fixed effects		Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
	Intercept	-0.155 **	0.058	-0.826 **	0.062	-0.611 **	0.060	2.643 **	0.448	-1.640 **	0.358	-1.109 **	0.140	1.312	0.673
Level 1	*Generation*														
Individuals	1940 and earlier			1.047 **	0.005	0.965 **	0.006	0.963 **	0.006	0.963 **	0.006	0.963 **	0.006	0.963 **	0.006
	1941-53			0.723 **	0.005	0.700 **	0.005	0.700 **	0.005	0.700 **	0.005	0.700 **	0.005	0.700 **	0.005
	1954-64			0.516 **	0.005	0.527 **	0.005	0.526 **	0.005	0.526 **	0.005	0.526 **	0.005	0.526 **	0.005
	1965-76			0.340 **	0.005	0.370 **	0.005	0.370 **	0.005	0.370 **	0.005	0.370 **	0.005	0.370 **	0.005
	1977-later			(ref.)		(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
	Age centered			0.021 **	0.000	0.022 **	0.000	0.023 **	0.000	0.023 **	0.000	0.023 **	0.000	0.023 **	0.000
	Gender					-0.110 **	0.003	-0.110 **	0.003	-0.110 **	0.003	-0.110 **	0.003	-0.110 **	0.003
	Education														
	ISCED 0-1					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
	ISCED 2					-0.117 **	0.006	-0.116 **	0.006	-0.116 **	0.006	-0.116 **	0.006	-0.116 **	0.006
	ISCED 3					-0.196 **	0.006	-0.196 **	0.006	-0.196 **	0.006	-0.196 **	0.006	-0.196 **	0.006
	ISCED 4					-0.265 **	0.010	-0.264 **	0.010	-0.264 **	0.010	-0.264 **	0.010	-0.264 **	0.010
	ISCED 5-6					-0.354 **	0.006	-0.354 **	0.006	-0.353 **	0.006	-0.354 **	0.006	-0.353 **	0.006
	Employment status														
	Employed					-0.031 **	0.007	-0.031 **	0.007	-0.031 **	0.007	-0.031 **	0.007	-0.031 **	0.007
	Unemployed					-0.019 **	0.004	-0.019 **	0.004	-0.019 **	0.004	-0.019 **	0.004	-0.019 **	0.004
	Not in labor force					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
	Community type														
	Big city					-0.072 **	0.005	-0.072 **	0.005	-0.072 **	0.005	-0.072 **	0.005	-0.072 **	0.005
	Suburbs					-0.040 **	0.005	-0.040 **	0.005	-0.040 **	0.005	-0.040 **	0.005	-0.040 **	0.005
	Town					(ref.)		(ref.)		(ref.)		(ref.)		(ref.)	
	Country village					0.035 **	0.004	0.035 **	0.004	0.036 **	0.004	0.035 **	0.004	0.035 **	0.004
	Farm					0.040 **	0.008	0.040 **	0.008	0.040 **	0.008	0.040 **	0.008	0.040 **	0.008

Level 2	*Time varying*																						
Country-waves	GDP (log)									-0.020		0.034								-0.034		0.040	
	Gini coefficient												0.015	**	0.005					0.015	**	0.005	
	Unemployment															-0.001		0.002		-0.002		0.003	
	Wave of survey			-0.013	**	0.003				-0.010	*	0.005	-0.014	**	0.003	-0.012	**	0.003		-0.009		0.006	
Level 3	*Time invariant*																						
Countries	GDP (log)									-0.321	**	0.045								-0.246	***	0.051	
	Gini coefficient												0.036	**	0.012					0.013		0.009	
	Unemployment															0.066	***	0.016		0.023		0.014	
Estimates of covariance parameters																							
Residual		0.851	**	0.002	0.676	**	0.002	0.660	**	0.002	0.660	**	0.002	0.660	**	0.002	0.660	***	0.002	0.660	***	0.002	
Intercept (country)		0.117	**	0.031	0.117	**	0.030	0.114	**	0.029	0.043	**	0.011	0.090	**	0.024	0.076	***	0.020	0.038	***	0.010	
Intercept (country*country-waves)		0.013	**	0.002	0.004	**	0.001	0.004	**	0.001	0.003	**	0.001	0.003	**	0.000	0.003	***	0.001	0.003	***	0.000	
Model comparisons																							
ICC (ρ): country		11.9	%		14.7	%		14.6	%		6.1	%		12.0	%		10.3	%		5.4	%		
ICC (ρ): country*country-waves		1.3	%		0.5	%		0.5	%		0.5	%		0.4	%		0.5	%		0.5	%		
Number of parameters		4			10			20			23			23			23			27			
Deviance		727841.8			673797.0			665118.2			665091.6			665113.3			665116.4			665110.8			
χ^2 Model improv. (prev. model)					54044.8	**		8678.9	**		26.5	**		4.8	**		1.8			7.4	***		
AIC		727847.8			673803.0			665124.2			665097.6			665119.3			665122.4			665116.8			
N																							
Individuals		274292																					
Country-waves		152																					
Countries		32																					

† To calculate the χ^2 for model improvement, the deviance used as reference in models 2 and 3 is that of the empty model (model 1). Models 4 to 7 used deviance from model 3 as reference.

Significance: ***p<0.01; **p<0.05.

Online Appendix

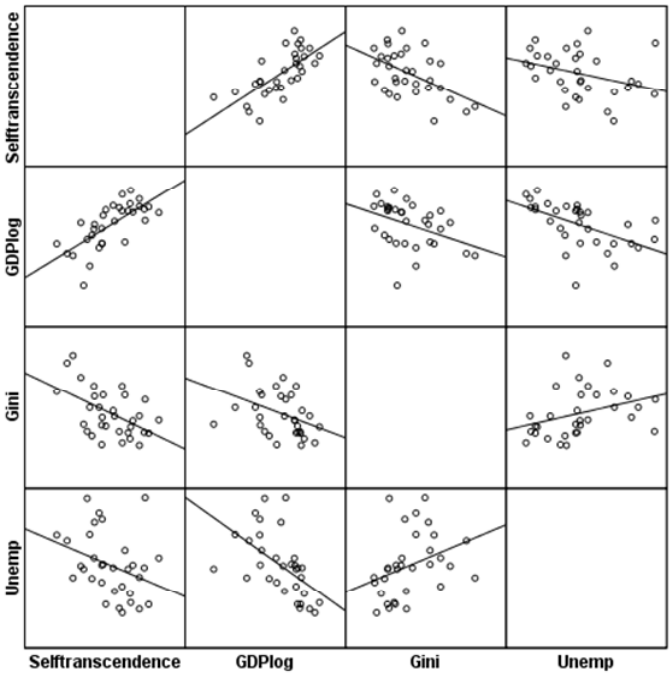


Figure A1. Scatterplots of Self-Enhancement vs. Self-Transcendence values with time-invariant contextual covariates.

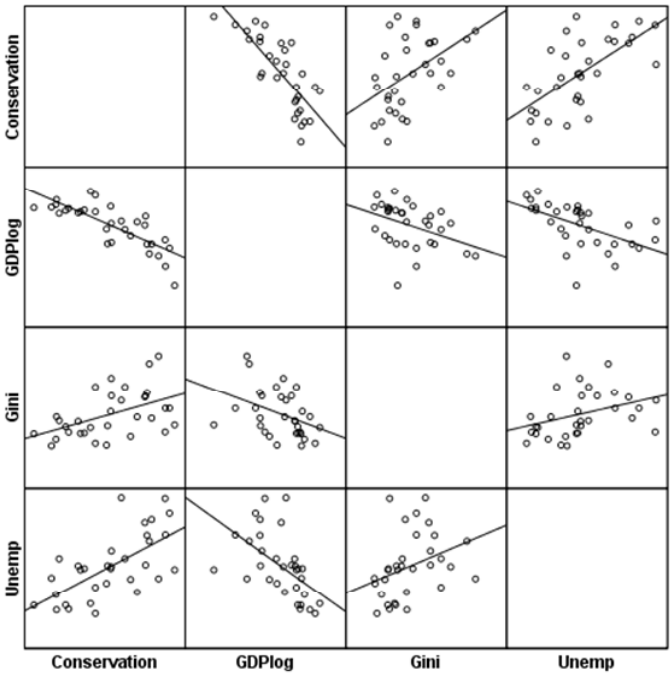


Figure A2. Scatterplots of Openness-to-Change vs. Conservation values with time-invariant contextual covariates.

Table A1. Country Level Data

	Conserv.	Selftrans.	GDP (log)*	Gini*	Unemp.*
Austria	0.01	-0.53	10.61	27.18	4.35
Belgium	0.32	-0.40	10.56	25.89	7.82
Bulgaria	-0.21	0.30	8.45	30.78	11.18
Switzerland	0.48	-0.60	11.03	29.14	3.88
Cyprus	0.13	0.07	10.16	29.09	5.63
Czech Rep.	-0.18	0.01	9.63	25.32	6.90
Germany	0.39	-0.42	10.52	28.21	8.20
Denmark	0.35	-0.61	10.84	24.76	5.40
Estonia	0.28	-0.15	9.37	33.23	9.63
Spain	0.55	-0.06	10.20	32.33	14.72
Finland	0.54	-0.37	10.63	25.95	7.95
France	0.75	-0.58	10.50	28.34	8.88
United Kingd.	0.24	-0.28	10.56	35.03	6.12
Greece	-0.15	0.13	10.04	32.95	12.35
Croatia	-0.04	0.19	9.31	28.85	12.65
Hungary	-0.05	-0.18	9.32	27.35	8.22
Ireland	0.11	-0.15	10.77	30.17	7.95
Israel	-0.33	-0.15	10.11	36.70	8.12
Iceland	0.61	-0.79	10.72	25.83	4.33
Italy	-0.03	0.14	10.39	33.21	8.28
Lithuania	-0.67	0.15	9.30	33.91	11.12
Luxembourg	0.36	-0.32	11.37	27.02	4.50
Netherlands	0.20	-0.50	10.69	26.13	3.95
Norway	0.24	-0.28	11.21	23.97	3.52
Poland	-0.08	0.33	9.15	30.78	13.25
Portugal	-0.15	-0.03	9.87	35.04	8.90
Russia	-0.44	0.24	8.85	41.00	6.97
Sweden	0.48	-0.64	10.74	23.50	7.02
Slovenia	-0.05	-0.19	9.89	23.64	6.50
Slovakia	-0.25	0.30	9.47	26.16	14.65
Turkey	-0.52	0.17	8.93	39.50	10.58
Ukraine	-0.30	0.38	7.71	27.53	7.83

Note. *The means of these contextual covariates are calculated following the "theoretical average" procedure.

Table A2. Country Level Pearson Correlations (n=32).

		1	2	3	4	5
1	**Self-Transcendence dimension**	1				
2	**Conservation dimension**	-0.771	1			
3	**GDP (time invariant)**	0.703	-0.791	1		
4	**Gini (time invariant)**	-0.516	0.484	-0.393	1	
5	**Unemployment (time invariant)**	-0.337	0.651	-0.544	0.345	1

Table A3. Country-Wave Level Data.

		Conserv.	Selftrans.	Log GDP	Gini	Unempl.
Austria	**2002**	-0.45	0.10	-0.43	-0.69	-0.35
	2004	-0.58	-0.05	-0.10	-0.28	0.55
	2006	-0.56	-0.02	-0.01	-0.34	0.35
Belgium	**2002**	-0.49	0.34	-0.44	1.05	-0.32
	2004	-0.37	0.36	-0.08	0.21	0.58
	2006	-0.41	0.33	0.01	-0.02	0.38
	2008	-0.37	0.28	0.23	-0.24	-0.82
	2010	-0.41	0.34	0.14	-0.45	0.48
	2012	-0.37	0.27	0.15	-0.56	-0.32
Bulgaria	**2006**	0.11	-0.06	-0.06	-1.23	-2.28
	2008	0.19	-0.05	0.42	1.75	-5.58
	2010	0.39	-0.36	0.35	3.44	-0.98
	2012	0.43	-0.30	0.44	3.79	1.12
Switzerland	**2002**	-0.73	0.51	-0.40	-1.84	-0.98
	2004	-0.62	0.55	-0.15	-2.34	0.42
	2006	-0.58	0.53	-0.08	1.11	0.12
	2008	-0.60	0.47	0.15	1.53	-0.48
	2010	-0.51	0.42	0.18	0.94	0.62
	2012	-0.52	0.33	0.30	0.60	0.32
Cyprus	**2006**	-0.07	0.07	0.02	0.02	-1.13
	2008	0.09	0.01	0.30	0.54	-2.03
	2010	0.23	0.22	0.16	0.87	0.67
	2012	0.01	0.23	0.11	1.16	6.17
Czech Rep.	**2002**	0.18	0.31	-0.64	0.79	0.40
	2004	0.03	-0.08	-0.27	1.28	1.40
	2008	-0.04	-0.21	0.40	-0.49	-2.50
	2010	-0.06	-0.33	0.26	-0.82	0.40
	2012	0.02	-0.40	0.26	-1.01	0.10
Germany	**2002**	-0.40	0.36	-0.39	-0.80	0.40
	2004	-0.39	0.34	-0.08	-0.41	2.10
	2006	-0.40	0.28	-0.02	0.14	2.10
	2008	-0.45	0.40	0.21	0.48	-0.70
	2010	-0.39	0.44	0.12	0.39	-1.10
	2012	-0.51	0.49	0.17	0.21	-2.80
Denmark	**2002**	-0.70	0.32	-0.42	-2.12	-0.80
	2004	-0.57	0.31	-0.09	-1.96	0.10
	2006	-0.57	0.38	0.02	-1.02	-1.50
	2008	-0.60	0.37	0.23	0.21	-2.00
	2010	-0.59	0.40	0.13	1.90	2.10
	2012	-0.61	0.31	0.13	3.00	2.10
Estonia	**2004**	-0.09	0.32	-0.29	1.47	0.37
	2006	-0.08	0.18	0.07	-0.58	-3.73
	2008	-0.20	0.23	0.43	-1.39	-4.13
	2010	-0.25	0.32	0.22	-0.73	7.27
	2012	-0.12	0.30	0.37	-0.94	0.47
Spain	**2002**	-0.07	0.24	-0.46	0.39	-3.12
	2004	-0.08	0.34	-0.08	-0.73	-3.52
	2006	-0.02	0.58	0.06	-1.27	-6.12
	2008	0.04	0.62	0.28	-0.77	-3.22
	2010	-0.14	0.70	0.13	0.97	5.48
	2012	-0.17	0.77	0.07	1.41	10.48
Finland	**2002**	-0.33	0.48	-0.43	-0.78	1.05
	2004	-0.33	0.49	-0.09	-0.25	0.85
	2006	-0.32	0.56	0.00	0.08	-0.35
	2008	-0.35	0.59	0.26	0.30	-1.65
	2010	-0.39	0.42	0.12	0.35	0.45
	2012	-0.48	0.69	0.14	0.30	-0.35
France	**2002**	-0.56	0.65	-0.40	-1.37	-0.18
	2004	-0.52	0.69	-0.07	-0.95	0.32
	2006	-0.59	0.83	0.01	-0.53	-0.08
	2008	-0.65	0.77	0.23	-0.15	-1.48
	2010	-0.62	0.77	0.12	1.09	0.42
	2012	-0.53	0.73	0.12	1.91	1.02

United Kingd.	**2002**	-0.34	0.15	-0.31	-1.08	-0.92
	2004	-0.26	0.19	-0.01	-0.63	-1.42
	2006	-0.33	0.27	0.10	0.16	-0.62
	2008	-0.33	0.30	0.16	0.58	-0.72
	2010	-0.24	0.23	0.00	0.67	1.78
	2012	-0.19	0.27	0.06	0.29	1.88
Greece	**2002**	0.17	-0.13	-0.50	0.69	-2.05
	2004	0.29	-0.08	-0.05	-0.25	-1.85
	2008	-0.03	-0.33	0.33	-0.63	-4.65
	2010	0.07	-0.08	0.16	0.35	0.15
Croatia	**2008**	0.13	-0.07	0.36	-0.58	-4.25
	2010	0.24	-0.01	0.20	0.45	-0.85
Hungary	**2002**	-0.14	-0.02	-0.52	-0.03	-2.42
	2004	-0.27	0.13	-0.09	0.79	-2.12
	2006	-0.22	0.05	0.01	0.66	-0.72
	2008	-0.13	-0.04	0.33	-0.52	-0.42
	2010	-0.19	-0.08	0.14	-0.62	2.98
	2012	-0.14	-0.26	0.13	-0.29	2.68
Ireland	**2002**	-0.07	0.14	-0.39	0.88	-3.75
	2004	-0.06	0.25	0.00	1.53	-3.45
	2006	-0.16	0.19	0.12	0.21	-3.55
	2008	-0.21	0.24	0.25	-0.67	-1.95
	2010	-0.22	-0.07	0.01	-0.77	5.95
	2012	-0.15	0.07	0.02	-1.19	6.75
Israel	**2002**	-0.29	-0.31	-0.30	-1.90	2.18
	2008	-0.09	-0.41	0.17	0.50	-2.02
	2010	-0.09	-0.25	0.21	0.80	-1.52
	2012	-0.12	-0.37	0.28	1.20	-1.22
Iceland	**2004**	-0.77	0.53	0.04	-0.20	-1.23
	2012	-0.80	0.66	-0.02	-1.20	1.67
Italy	**2002**	-	-	-0.38	0.63	0.92
	2004	0.18	-0.15	-0.04	0.79	-0.38
	2012	0.07	0.18	0.07	-0.39	2.42
Lithuania	**2010**	0.17	-0.41	0.09	0.88	6.68
	2012	0.13	-0.86	0.27	0.28	2.08
Luxembourg	**2002**	-	-	-0.51	-0.40	-1.90
	2004	-0.32	0.36	-0.15	-0.12	0.60
Netherlands	**2002**	-0.44	0.19	-0.42	-0.63	-1.35
	2004	-0.44	0.24	-0.10	0.47	0.65
	2006	-0.55	0.19	0.01	0.88	-0.05
	2008	-0.52	0.19	0.26	0.65	-1.15
	2010	-0.54	0.20	0.14	-0.43	0.55
	2012	-0.54	0.17	0.12	-0.94	1.35
Norway	**2002**	-0.25	0.21	-0.54	0.90	0.38
	2004	-0.20	0.18	-0.25	1.63	0.88
	2006	-0.26	0.24	0.01	0.27	-0.12
	2008	-0.26	0.19	0.28	-0.73	-0.92
	2010	-0.36	0.35	0.18	-1.06	0.08
	2012	-0.35	0.28	0.32	-1.01	-0.32
Poland	**2002**	0.37	-0.07	-0.60	-1.53	6.65
	2004	0.37	-0.11	-0.35	0.72	5.75
	2006	0.31	-0.09	-0.05	0.33	0.55
	2008	0.26	-0.08	0.39	0.21	-6.15
	2010	0.33	-0.10	0.28	0.22	-3.65
	2012	0.36	-0.05	0.32	0.05	-3.15
Portugal	**2002**	-0.14	0.02	-0.41	0.67	-3.90
	2004	-0.04	-0.29	-0.07	1.38	-2.20
	2006	-0.03	-0.05	0.02	0.89	-1.20
	2008	0.00	-0.12	0.25	-0.40	-1.30
	2010	-0.02	-0.23	0.15	-1.20	1.90
	2012	-0.01	-0.20	0.06	-1.34	6.70
Russia	**2006**	0.30	-0.39	-0.01	-0.12	0.13
	2008	0.29	-0.41	0.51	0.40	-0.77
	2010	0.20	-0.48	0.42	0.63	0.33
	2012	0.19	-0.49	0.70	0.65	-1.47
Sweden	**2002**	-0.55	0.37	-0.44	-0.54	-1.72

	2004	-0.57	0.38	-0.08	-0.39	-0.42
	2006	-0.64	0.42	0.00	0.41	0.08
	2008	-0.64	0.44	0.19	0.57	-0.72
	2010	-0.82	0.69	0.12	0.14	1.68
	2012	-0.67	0.58	0.21	-0.19	1.08
Slovenia	**2002**	-0.18	-0.10	-0.51	-1.54	-0.20
	2004	-0.22	-0.05	-0.13	-0.54	-0.20
	2006	-0.27	-0.01	0.00	-0.57	-0.50
	2008	-0.22	-0.06	0.33	0.03	-2.10
	2010	-0.18	-0.10	0.17	1.56	0.70
	2012	-0.04	0.05	0.13	1.06	2.30
Slovakia	**2004**	0.19	-0.14	-0.20	0.74	3.45
	2006	0.22	-0.26	0.01	-0.53	-1.35
	2008	0.43	-0.19	0.36	-0.82	-5.05
	2010	0.36	-0.23	0.24	0.14	-0.25
	2012	0.27	-0.39	0.28	-0.10	-0.75
Turkey	**2004**	0.29	-0.34	-0.25	1.42	0.22
	2008	0.07	-0.67	0.32	-0.63	0.42
Ukraine	**2004**	0.44	-0.16	-0.49	0.12	0.77
	2006	0.48	-0.19	0.03	0.38	-1.03
	2008	0.37	-0.29	0.56	-0.16	-1.43
	2010	0.34	-0.37	0.29	-0.48	0.27
	2012	0.26	-0.45	0.55	-0.98	-0.33

Table A4. Country-Wave Level Pearson Correlations (n=150).

		1	2	3	4	5	6
1	**Self-Transcendence dimension**	1					
2	**Conservation dimension**	-0.721	1				
3	**GDP (time-varying)**	-0.222	0.187	1			
4	**Gini (time-varying)**	-0.060	0.179	0.127	1		
5	**Unemployment (time-varying)**	0.051	-0.071	-0.140	0.046	1	
6	**Year**	-0.215	0.295	0.331	0.016	0.092	1

Table A5. Per Capita GDP with a Logarithmic Transformation by Country and Wave Used to Produce the "Theoretical Averages"

	2002	2004	2006	2008	2010	2012	Mean	SD
Austria	10.18	10.51	10.61	10.85	10.75	10.79	10.61	0.22
Belgium	10.13	10.48	10.57	10.79	10.70	10.71	10.56	0.22
Bulgaria	7.64	8.11	8.38	8.87	8.79	8.88	8.45	0.46
Switzerland	10.63	10.88	10.96	11.19	11.22	11.33	11.03	0.24
Cyprus	9.68	10.07	10.18	10.46	10.32	10.27	10.16	0.25
Czech Republic	8.99	9.36	9.63	10.03	9.89	9.89	9.63	0.36
Germany	10.13	10.44	10.50	10.73	10.64	10.69	10.52	0.20
Denmark	10.41	10.75	10.86	11.07	10.96	10.96	10.84	0.21
Estonia	8.58	9.09	9.44	9.80	9.59	9.75	9.37	0.43
Spain	9.74	10.12	10.26	10.48	10.33	10.27	10.20	0.23
Finland	10.20	10.54	10.62	10.89	10.74	10.77	10.63	0.22
France	10.10	10.43	10.51	10.72	10.61	10.62	10.50	0.20
United Kingdom	10.25	10.55	10.66	10.72	10.55	10.62	10.56	0.15
Greece	9.54	9.98	10.11	10.36	10.20	10.02	10.04	0.25
Croatia	8.71	9.14	9.34	9.67	9.51	9.49	9.31	0.31
Hungary	8.80	9.23	9.34	9.65	9.47	9.46	9.32	0.27
Ireland	10.38	10.77	10.90	11.02	10.78	10.79	10.77	0.19
Israel	9.81	9.89	9.98	10.28	10.33	10.39	10.11	0.23
Iceland	10.37	10.76	10.94	10.92	10.64	10.70	10.72	0.19
Italy	10.01	10.35	10.42	10.61	10.49	10.46	10.39	0.19
Lithuania		8.81	9.13	9.61	9.39	9.57	9.30	0.30
Luxembourg	10.86	11.22	11.39	11.63	11.54	11.57	11.37	0.26
Netherlands	10.27	10.59	10.69	10.94	10.83	10.80	10.69	0.22
Norway	10.67	10.96	11.21	11.48	11.38	11.53	11.21	0.30
Poland	8.56	8.80	9.10	9.54	9.44	9.48	9.15	0.37
Portugal	9.46	9.80	9.89	10.12	10.02	9.93	9.87	0.21
Russia	7.77	8.32	8.84	9.36	9.28	9.55	8.85	0.63
Sweden	10.29	10.66	10.74	10.93	10.86	10.95	10.74	0.22
Slovenia	9.38	9.76	9.89	10.22	10.06	10.02	9.89	0.27
Slovakia	8.79	9.28	9.48	9.83	9.71	9.75	9.47	0.36
Turkey	8.18	8.68	8.95	9.25	9.22	9.27	8.93	0.39
Ukraine	6.78	7.22	7.74	8.27	8.00	8.26	7.71	0.55

Table A6. Gini Coefficient by Country and Wave Used to Produce the "Theoretical Averages"

	2002	2004	2006	2008	2010	2012	Mean	SD
Austria	26.48	26.90	26.83	27.06	27.66	28.12	27.18	0.60
Belgium	26.93	26.10	25.87	25.65	25.43	25.33	25.89	0.59
Bulgaria	26.74	27.08	29.55	32.53	34.22	34.58	30.78	3.49
Switzerland	27.30	26.80	30.25	30.68	30.08	29.74	29.14	1.66
Cyprus	27.39	28.21	29.11	29.63	29.96	30.25	29.09	1.10
Czech Republic	26.11	26.60	25.58	24.84	24.51	24.32	25.32	0.92
Germany	27.41	27.80	28.35	28.69	28.60	28.43	28.21	0.50
Denmark	22.63	22.80	23.73	24.97	26.65	27.75	24.76	2.10
Estonia	35.41	34.70	32.65	31.84	32.50	32.29	33.23	1.46
Spain	32.73	31.60	31.06	31.57	33.30	33.74	32.33	1.08
Finland	25.18	25.70	26.04	26.26	26.30	26.26	25.95	0.44
France	26.97	27.39	27.81	28.19	29.43	30.25	28.34	1.26
United Kingdom	33.95	34.40	35.19	35.61	35.70	35.32	35.03	0.70
Greece	33.65	32.70	32.21	32.33	33.30	33.54	32.95	0.63
Croatia	28.60	28.62	28.18	28.27	29.30	30.11	28.85	0.74
Hungary	27.32	28.14	28.00	26.83	26.73	27.05	27.35	0.60
Ireland	31.05	31.70	30.38	29.50	29.40	28.98	30.17	1.06
Israel	34.79	35.91	36.89	37.19	37.50	37.90	36.70	1.15
Iceland	25.91	25.64	26.33	26.78	25.72	24.64	25.83	0.72
Italy	33.84	34.00	33.48	32.40	32.70	32.82	33.21	0.66
Lithuania	32.04	32.96	34.37	35.13	34.79	34.19	33.91	1.18
Luxembourg	26.62	26.90	27.27	27.27	26.90	27.18	27.02	0.26
Netherlands	25.50	26.60	27.01	26.78	25.70	25.19	26.13	0.76
Norway	24.87	25.60	24.24	23.25	22.92	22.96	23.97	1.11
Poland	29.25	31.50	31.12	30.99	31.00	30.83	30.78	0.78
Portugal	35.71	36.42	35.93	34.65	33.85	33.71	35.04	1.14
Russia	40.14	40.30	40.88	41.39	41.63	41.65	41.00	0.67
Sweden	22.96	23.11	23.90	24.07	23.64	23.30	23.50	0.44
Slovenia	22.10	23.10	23.07	23.67	25.20	24.70	23.64	1.14
Slovakia	26.73	26.90	25.63	25.34	26.30	26.06	26.16	0.61
Turkey	40.97	40.92	40.06	38.87	38.15	38.03	39.50	1.33
Ukraine	28.66	27.65	27.91	27.37	27.05	26.54	27.53	0.73

Table A7. Unemployment Rate by Country and Wave Used to Produce the "Theoretical Averages"

	2002	2004	2006	2008	2010	2012	Mean	SD
Austria	4.0	4.9	4.7	3.8	4.4	4.3	4.35	0.41
Belgium	7.5	8.4	8.2	7.0	8.3	7.5	7.82	0.56
Bulgaria	18.1	12.0	8.9	5.6	10.2	12.3	11.18	4.17
Switzerland	2.9	4.3	4.0	3.4	4.5	4.2	3.88	0.61
Cyprus	3.3	4.3	4.5	3.6	6.3	11.8	5.63	3.20
Czech Republic	7.3	8.3	7.1	4.4	7.3	7.0	6.90	1.31
Germany	8.6	10.3	10.3	7.5	7.1	5.4	8.20	1.92
Denmark	4.6	5.5	3.9	3.4	7.5	7.5	5.40	1.77
Estonia	9.4	10.0	5.9	5.5	16.9	10.1	9.63	4.10
Spain	11.6	11.2	8.6	11.5	20.2	25.2	14.72	6.48
Finland	9.0	8.8	7.6	6.3	8.4	7.6	7.95	1.00
France	8.7	9.2	8.8	7.4	9.3	9.9	8.88	0.84
United Kingdom	5.2	4.7	5.5	5.4	7.9	8.0	6.12	1.45
Greece	10.3	10.5	8.9	7.7	12.5	24.2	12.35	6.03
Croatia	15.1	13.7	11.1	8.4	11.8	15.8	12.65	2.76
Hungary	5.8	6.1	7.5	7.8	11.2	10.9	8.22	2.33
Ireland	4.2	4.5	4.4	6.0	13.9	14.7	7.95	4.97
Israel	10.3	10.4	8.4	6.1	6.6	6.9	8.12	1.89
Iceland	3.3	3.1	3.0	3.0	7.6	6.0	4.33	1.98
Italy	9.2	7.9	6.8	6.7	8.4	10.7	8.28	1.52
Lithuania	13.0	11.3	5.6	5.8	17.8	13.2	11.12	4.72
Luxembourg	2.6	5.1	4.7	5.1	4.4	5.1	4.50	0.97
Netherlands	2.6	4.6	3.9	2.8	4.5	5.3	3.95	1.07
Norway	3.9	4.4	3.4	2.6	3.6	3.2	3.52	0.61
Poland	19.9	19.0	13.8	7.1	9.6	10.1	13.25	5.27
Portugal	5.0	6.7	7.7	7.6	10.8	15.6	8.90	3.79
Russia	7.9	7.8	7.1	6.2	7.3	5.5	6.97	0.94
Sweden	5.3	6.6	7.1	6.3	8.7	8.1	7.02	1.24
Slovenia	6.3	6.3	6.0	4.4	7.2	8.8	6.50	1.45
Slovakia	18.6	18.1	13.3	9.6	14.4	13.9	14.65	3.33
Turkey	10.4	10.8	10.2	11.0	11.9	9.2	10.58	0.90
Ukraine	9.6	8.6	6.8	6.4	8.1	7.5	7.83	1.18

Footnotes

[i] Uzefovsky, Döring, and Knafo-Noam (2016) showed convincingly that not only environmental but also genetic and factors are involved in the formation of most Schwartz values already at young ages.

[ii] We use capital letters in the equation to denote matrices.

[iii] See Schmidt-Catran and Faibrother (2016) for a detailed analysis of the consequences of not using these type of models when modeling survey data from multiple countries and points in time.

[iv] For example, in case we were interested in introducing the GDP per capita as a contextual covariate for the specific case of a country only surveyed on three out of six possible occasions, such as the case of Austria, in the "actual averages" approach we would use its GDP data only from those time points that coincide with the survey waves (2002, 2004, and 2006, see Table A3) to produce the time invariant covariate $\bar{Z}_j$. Whereas in the "theoretical averages" approach we use the GDP data from all the six possible survey waves (2002, 2004, 2006, 2008, 2010, and 2012, see Table A5), independent of how often Austria participated, to construct the average across waves per country, the $\bar{Z}_j$ (see Table A1). And then this $\bar{Z}_j$ will be used in the calculation of the time-varying component: $(Z_{tj} - \bar{Z}_j)$.

[v] A further consequence of applying the "theoretical averages" procedure is that the dependent variable and its contextual covariates might no longer be totally uncorrelated as in the "actual average" approach. However, this situation is not necessarily problematic because correlations tend to be rather low.

[vi] www.europeansocialsurvey.org

[vii] Data are weighted using the 'design weight' (dweigth) provided by the ESS.

[viii] See ESS survey documentation: https://www.europeansocialsurvey.org/docs/round6/survey/ESS6_appendix_a1_e02_0.pdf

[ix] Worldbank http://data.worldbank.org/indicator/NY.GDP.PCAP.CD

[x] The Standardized World Income Inequality Database https://dataverse.harvard.edu/dataset.xhtml?persistentId=hdl:1902.1/11992

[xi] Worldbank http://data.worldbank.org/indicator/SL.UEM.TOTL.ZS/countries

[xii] Mishler and Rose (2007), studied APC effects in political attitudes in Russia using repeated cross-section surveys with a multilevel model with two levels where age (centered) and cohort were individual level covariates, and period was a context level covariate.

[xiii] http://www.europeansocialsurvey.org/docs/methodology/ESS_weighting_data.pdf

[xiv] The contribution of linear period effects is minor. The reduction in models deviance with only age and cohort as predictors is 54,040 (model not shown for simplicity), while when period is included it is 54,044.8.