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Rammstedt, Beatrice; Danner, Daniel; Bosnjak, Michael

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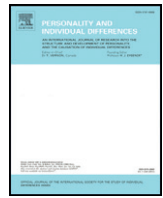
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# Acquiescence response styles: A multilevel model explaining individual-level and country-level differences



Beatrice Rammstedt\*, Daniel Danner, Michael Bosnjak

GESIS – Leibniz Institute for the Social Sciences, Germany

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## ABSTRACT

Acquiescence has been found to distort the psychometric quality of questionnaire data. Previous research has identified various determinants of acquiescence at both the individual and the country level. We aimed to synthesize the scattered body of knowledge by concurrently testing a multilevel model encompassing a set of presumed predictors of acquiescence. Based on a representative sample comprising almost 40,000 respondents from 20 European countries, we analyzed the effects of the country-level indicators economic wealth, corruption level, and collectivism and the individual-level indicators age, gender, educational attainment, and conservatism. Results revealed that 15% of the variance in acquiescence was due to country-level variations in corruption levels and collectivism. Differences among individuals within countries could be partially explained by conservatism and educational attainment.

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## 1. Introduction

Acquiescence—that is, the tendency to respond to descriptions of conceptually distinct attributes or attitudes with agreement/affirmation (agreement acquiescence) or disagreement/opposition (counter-acquiescence) regardless of their content—has been widely recognized as a threat to the validity of questionnaire-based data (e.g., Rammstedt, Goldberg, & Borg, 2010; Soto, John, Gosling, & Potter, 2008). Specifically, acquiescence can affect mean levels in item responding, thereby yielding misleading mean differences. For example, Van Vlimmeren, Moors, and Gelissen (2015) showed that country-level differences in trust in NATO differed substantially before and after controlling for acquiescence. Such effects of acquiescence on mean-level differences can occur if acquiescence differentially affects item responding across countries. Moreover, acquiescence may blur the intended factorial structure of a questionnaire by biasing item variances and covariances (Rammstedt et al., 2010). Finally, it has been shown that acquiescence can substantially bias the associations between personality items and behavioral criteria, thereby attenuating predictive validity (Danner, Aichholzer, & Rammstedt, 2015).

Given the threats that acquiescence poses to the validity of questionnaire-based data, the overall aim of the study reported here was to summarize and integrate the available body of knowledge with regard to central socio-demographic and social indicators into one single conceptual model encompassing the presumed determinants of acquiescence.

In what follows, we begin by summarizing the reported evidence on individual-level determinants and then address country-level predictors.

### 1.1. Individual-level predictors of acquiescent responding

Numerous studies have revealed that individuals differ systematically in their tendency to acquiesce. However, the empirical evidence is not univocal. While some studies have suggested that age is positively related to acquiescence (e.g., Meisenberg & Williams, 2008; Weijters, Geuens, & Schillewaert, 2010), others have failed to find evidence in support of this notion (e.g., Eid & Rauber, 2000). Findings with regard to possible effects of gender on acquiescent responding are even more heterogeneous. Some studies have suggested that women show, on average, a higher tendency toward acquiescent responding than men (e.g., Weijters et al., 2010), whereas others have found no gender effect (e.g., Marin, Gamba, & Marin, 1992). However, a broad consensus exists that educational attainment is a source of systematic differences in the tendency to acquiesce. Results of several studies have indicated that acquiescence appears to be more frequent among persons with a lower level of educational attainment (e.g., Narayan & Krosnick, 1996; Rammstedt et al., 2010; Rammstedt & Kemper, 2011). It has been suggested that persons with relatively low education have less clear self-concepts, smaller vocabularies, and less developed verbal comprehension skills than more highly educated persons. This may make them relatively uncertain when it comes to responding to questionnaire items, and may thus leave more room for the influence of systematic response biases (e.g., Goldberg, 1963). For some countries (e.g., Germany), this inverse effect of education on acquiescence has been widely replicated. Moreover, there is evidence to suggest that this effect can be replicated in several other countries, albeit with some exceptions (Danner et al.,

\* Corresponding author at: GESIS – Leibniz Institute for the Social Sciences, PO Box 12 21 55, 68072 Mannheim, Germany.

E-mail address: [beatrice.rammstedt@gesis.org](mailto:beatrice.rammstedt@gesis.org) (B. Rammstedt).

2015; Rammstedt, Kemper, & Borg, 2013). However, results do not indicate a simple generalizability of the inverse effect of education on acquiescence across all countries (Meisenberg & Williams, 2008; Rammstedt et al., 2013). Rather, countries appear to differ systematically in this regard. Moreover, Smith and Fischer (2008) were able to show that individual-level interdependence, used as a proxy for a collectivistic cultural orientation, was positively related to acquiescence. Taken together, the literature on individual-level determinants of acquiescence partially supports the role of age, gender, level of educational attainment, and degree of conservatism in acquiescent responding.

### 1.2. Country-level predictors of acquiescent responding

In addition to individual differences in acquiescent responding, recent research has identified cross-national differences in the tendency to acquiesce, as reflected by mean-level differences (e.g., Javeline, 1999; Johnson, Kulesa, Cho, & Shavitt, 2005). For example, Van Herk, Poortinga, and Verhallen (2004) investigated acquiescent response tendencies in six European countries. The results revealed that respondents in the Mediterranean countries scored higher on acquiescence than those in the Northwestern European countries. A worldwide investigation of acquiescence was conducted by Meisenberg and Williams (2008). Based on the World Value Survey conducted in 80 countries, they showed that response styles were most prevalent in less developed countries and that—at the country level—acquiescence could best be explained by the country's corruption level. The authors interpreted their findings by suggesting that people who live in corrupt societies tend to be subservient to powerful others—a tendency that carries over into their survey responses. A similar effect was reported by Smith (2004), suggesting that acquiescence is significantly less pronounced in certain European countries than in countries with lower levels of economic development such as Panama, Nigeria, or the Philippines.

In addition, there is a broad consensus that response styles are systematically related to cultural variables (Hofstede, 2001; Schwartz, 1994) and that they tend to be more pronounced in traditional cultures (Javeline, 1999). Specifically, several studies have suggested that the prevalence of acquiescence differs across countries and depends on cultural orientations. For example, a study by Johnson et al. (2005) indicated that collectivistic cultures were especially prone to acquiescent responding. The authors hypothesized that members of collectivistic nations experienced greater cultural pressure to acquiesce (Smith & Fischer, 2008). Support for this association was also provided by Harzing (2006), who investigated 26 countries from all major cultural clusters in the world. However, Grimm and Church (1999) could not confirm the effect of collectivism on acquiescence response style.

In sum, the results of cross-national comparative research suggest that there are systematic differences between countries with regard to the mean tendency to acquiesce and that these differences are a function of the country's social and economic situation and its cultural orientations—in particular, the degree to which collectivistic values are endorsed. Thus, we expect that individual differences at the country level can be explained by these variables.

### 1.3. Assessing acquiescent responding

Even though the nature of, and the reasons for, acquiescence are still unclear, different approaches are used to investigate a person's tendency toward acquiescence. Some studies—especially those that use only positively keyed items—use the percentage or ratio of items agreed with (e.g. Harzing, 2006). For this approach, too, different methods of including and weighting the responses are employed across studies. Instead of using only positively keyed items, recent studies (e.g. Johnson et al., 2005, Rammstedt & Kemper, 2011; Rammstedt & Farmer, 2013; Rammstedt et al., 2010, 2013; Soto et al., 2008) have used, whenever possible, pairs of positively and negatively coded items assessing the same construct (e.g., *Prefer to be with others* and *Like to be all by oneself*).

Persons with a high tendency toward acquiescence should have comparatively higher mean scores across these item pairs than those with a lower tendency to acquiesce. Even though some studies report only a weak consistency of acquiescence across different scales in general (e.g. Ferrando, Condon, & Chico, 2004), other studies report latent correlations  $r > 0.71$  between acquiescence indicators of such pairs of negatively and positively keyed items (Danner et al., 2015).

### 1.4. The present study

As summarized above, past research has yielded evidence of individual-level determinants (age, gender, and educational attainment) and country-level predictors (economic development, degree of collectivism, corruption level) of the tendency to acquiesce. However, previous studies have yielded inconsistent findings with regard to these characteristics. These inconsistencies may be due to the fact that most of these studies used highly selective samples that were not representative of the respective populations. In addition, to date no study has concurrently and systematically investigated these country-level and individual-level characteristics, taking into account the multilevel interrelationships between them.

The present study aimed to fill this gap by investigating potential determinants of acquiescence by simultaneously analyzing the different country-level and individual-level characteristics and by relying on data that were representative of the population in 20 European countries. Specifically, we investigated the impact on the tendency toward acquiescent responding of the country-level characteristics economic wealth (GDP), corruption level, and level of collectivism in combination with the individual characteristics age, gender, educational level, and degree of conservatism. Individual-level and country-level predictors can be combined in one multilevel model where respondents ( $i$ ) are nested within countries ( $j$ ), and differences in acquiescence at the respondent level are modeled as  $acq_{ij} = \beta_{0j} + \beta_1(\text{age}) + \beta_2(\text{gender}) + \beta_3(\text{education}) + \beta_4(\text{conservatism}) + \epsilon_{ij}$ , and differences at the country level are modeled as  $\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{wealth}) + \gamma_{02}(\text{corruption}) + \gamma_{03}(\text{collectivism}) + \nu_{0j}$ .

## 2. Method

### 2.1. Data source

The present analyses are based on data of the European Social Survey (ESS; [www.europeansocialsurvey.org/data](http://www.europeansocialsurvey.org/data)). The ESS is a cross-national survey that investigates changes in social structure, conditions, and attitudes in Europe. A key aim of the ESS is to implement high quality standards in its methodology. These high quality standards are especially relevant for the translation and adaptation of the questionnaires to guarantee comparability across the different countries. The survey has been conducted every two years since 2001.

To test our conceptual multilevel model, we selected Round 1 of the ESS (European Social Survey Round 1 Data, 2002) as a data source because it included several contrasting item pairs that had already been used in an earlier study as an indicator for acquiescence (Johnson, Mohler, Harkness, & Braun, 2010).

### 2.2. Samples

The 2002 round of the ESS collected data from 22 European countries. For the present analyses, only those countries for which all relevant indicators were available were included. Therefore, Italy and Luxembourg were excluded from our analyses because conservatism was not assessed in these countries. A list of the countries included in our analyses can be found in Table 1. In each country, a sample representative of the population aged 15 years and over was drawn. Design weights provided in the data set were applied to adjust for different selection probabilities. The number of interviews conducted ranged

**Table 1**  
Sample characteristics for the 20 countries investigated.

	N	Country indicators			Individual indicators				Acquiescence	
		GDP	CL	Collectivism	Age (M)	Female (%)	LE (M)	Conservatism (M)	Mean	SD
Austria	2257	198	7.8	55	46.59	54	2.92	2.88		
Belgium	1899	244	7.1	75	44.83	49	3.05	2.71	3.28	0.38
Switzerland	2040	216	8.5	68	47.56	52	3.32	2.96	3.24	0.32
Czech Republic	1360	148	3.7	58	51.91	52	3.10	2.50	3.38	0.36
Germany	2919	1939	7.3	67	47.31	52	3.36	2.83	3.27	0.30
Denmark	1506	130	9.5	74	46.43	49	3.31	3.07	3.08	0.34
Spain	1729	720	7.1	51	48.60	53	2.39	2.36	3.44	0.36
Finland	2000	110	9.7	63	45.63	52	2.89	2.75	3.36	0.38
France	1503	1327	6.3	71	47.32	55	2.96	2.80	3.45	0.40
United Kingdom	2052	1329	8.7	89	48.57	53	2.78	2.80	3.28	0.32
Greece	2566	178	4.2	35	49.66	57	2.30	2.03	3.59	0.37
Hungary	1685	107	4.9	80	46.14	52	2.81	2.45	3.44	0.37
Ireland	2046	80	6.9	70	45.71	54	2.90	2.53	3.35	0.33
Israel	2499	114	7.3	54	41.77	54	3.31	2.45	3.33	0.37
Netherlands	2364	395	9	80	48.07	56	2.98	2.85	3.15	0.33
Norway	2036	119	8.5	69	45.82	46	3.44	3.01	3.16	0.31
Poland	2110	318	4	60	42.9	51	2.94	2.26	3.48	0.32
Portugal	1511	150	6.3	27	47.86	58	1.88	2.78	3.58	0.34
Sweden	1999	214	9.3	71	46.26	49	2.93	3.17	3.21	0.28
Slovenia	1519	33	6	20	44.42	52	2.94	2.51	3.35	0.33
Mean	1980	145	7.1	62	46.67	53	2.93	2.69	3.34	0.34
SD	409	139	1.9	18	2.28	3	0.38	0.29	0.14	0.03

Notes. GDP = gross domestic product in billion EUR adjusted for purchasing power; CL = Corruption level from 0 (highly corrupt) to 10 (very clean); collectivism scale from 0 (collectivistic) to 100 (individualistic); age = mean age; LE = level of education from 1 (less than lower secondary education) to 5 (tertiary education completed); conservatism from 1 (individualistic) to 6 (conservative).

between 1360 in the Czech Republic and 2919 in Germany, with a total sample size of 39,600 respondents.

ESS questionnaires are administered as face-to-face interviews. Participation is voluntary and not usually incentivized—although some countries offer small incentives in order to increase participation. (For a detailed description of the samples and the assessment design, see [European Social Survey Round 1 Data, 2002](#)).

## 2.3. Measures and procedure

### 2.3.1. Individual-level characteristics

**2.3.1.1. Demographics.** Respondents' age was assessed in ESS Round 1 via the year of birth. Gender was assessed in ESS Round 1 with a dichotomous variable (1 = men, 2 = women). Levels of educational attainment were assessed in all countries on the basis of the national education system. Later, the ESS researchers harmonized these national data into one variable with reference to the International Standard Classification of Education (ISCED) 1997 levels, which yielded five categories: (1) "Less than lower secondary education (ISCED 0–1)"; (2) "Lower secondary education completed (ISCED 2)"; (3) "Upper secondary education completed (ISCED 3)"; (4) "Post-secondary, non-tertiary education completed (ISCED 4)"; (5) "Tertiary education completed (ISCED 5)".

**2.3.1.2. Conservatism.** As a supplement to the ESS, the Portrait Values Questionnaire (PVQ; [Schwartz, Melech, Lehmann, Burgess, & Harris, 2001](#)) was administered, allowing, among other things, the assessment of the higher order value dimension *conservatism*, which overlaps strongly with the cultural orientation *collectivism* as defined by Hofstede (see, e.g., [Schwartz & Ros, 1996](#)). The conservatism dimension includes the lower order scales *conformity*, *tradition*, and *security*. It includes items such as "She/he believes that people should do what they're told" (conformity). All items are to be answered on a six-point scale ranging from *not like me at all* to *very much like me*. Cronbach's alpha ranged between 0.67 (Hungary) and 0.78 (Austria).

### 2.3.2. Country-level characteristics

**2.3.2.1. Economic wealth.** As an indicator for the economic wealth of each country, the logarithm of its gross domestic product (GDP, adjusted for purchasing power) averaged across the years 1990 to 2002 (as suggested by [Meisenberg & Williams, 2008](#)), was used. Information was retrieved from the World Development Indicators of the World Bank ([data.worldbank.org/data-catalog/world-development-indicators](http://data.worldbank.org/data-catalog/world-development-indicators)).

**2.3.2.2. Corruption level.** A measure of the corruption level per country was obtained based on averaged scores of Transparency International's Corruption Perceptions Index for the years 1999–2005 ([transparency.org](http://transparency.org)).

**2.3.2.3. Collectivism.** Country-level scores on an individualism–collectivism scale for the 20 countries investigated in the present study were taken from [Hofstede \(2001\)](#).

### 2.3.3. Acquiescence

As an indicator of acquiescent responding, an acquiescence measure was constructed on the basis of eight pairs of survey responses from the ESS questionnaire. These item pairs, which constituted sets of statements that clearly represented opposing opinions, stem from different question blocks within the ESS questionnaire and are intended to measure different constructs ranging from socio-political evaluations to attitudes toward migrants. A full list of these item pairs can be found in Table S1. All items were to be answered on a five-point Likert scale ranging from *agree strongly* to *disagree strongly*.

In line with earlier research ([Aichholzer, 2014](#); [Billiet & McClendon, 2000](#); [Danner et al., 2015](#); [Rammstedt et al., 2010](#); [Rammstedt & Kemper, 2011](#); [Rammstedt & Farmer, 2013](#)), we scored the acquiescence scale by averaging all 16 items. Given that eight items were positively keyed and eight items were negatively keyed, the resulting mean score does not reflect any construct variance but rather only acquiescence (and random measurement error). We estimated the reliability of the acquiescence index by subtracting each item from its opposing item and subsequently calculated Cronbach's alpha.

Cronbach's alpha was 0.47 on average and varied between 0.39 (Denmark) and 0.58 (Greece).<sup>1</sup>

Table 1 provides an overview of the distribution of the different indicators investigated in the 20 countries.

### 3. Results

In a first step, we investigated whether the 20 countries differed in their tendency toward acquiescent responding. We specified a baseline multilevel model with respondents (*i*) being nested within countries (*j*),  $acquiescence_{ij} = \beta_{0j} + \varepsilon_{ij}$  that allowed acquiescence differences between countries,  $\beta_{0j} = \gamma_{00} + \nu_{0j}$ . The model parameters were estimated using the residual maximum likelihood estimator implemented in SAS 9.3. The model revealed an intra-class correlation of  $ICC = 0.15$ , which indicates that 15% of the total acquiescence variance can be explained by systematic country differences. Hence, the 20 European countries investigated differed systematically in their mean tendency toward acquiescent responding. On average, the highest acquiescence scores were found in Greece, followed by Portugal and Poland; the lowest mean acquiescence scores were found in Norway, the Netherlands, and Denmark (see Table 1).

In a second step, we concurrently investigated different possible determinants of these between-country and within-country differences in acquiescent responding: We conducted a second multilevel analysis with age, gender, educational level, and the degree of conservatism as individual factors:  $acquiescence_{ij} = \beta_{0j} + \beta_1(\text{age}) + \beta_2(\text{gender}) + \beta_3(\text{education}) + \beta_4(\text{conservatism}) + \varepsilon_{ij}$ . At the country level, we investigated economic wealth, corruption level, and degree of collectivism:  $\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{wealth}) + \gamma_{02}(\text{corruption}) + \gamma_{03}(\text{collectivism}) + \nu_{0j}$ . The intercorrelations between the individual-level predictor variables and between the country-level predictors are shown in Table S2. They indicate that GDP and collectivism, in particular, are moderately interrelated ( $-0.42$ ). The results of the second multilevel model fitted to the data are shown in Table 2.

With the exception of GDP, all country-level predictors contributed significantly to explaining the tendency to acquiesce. The highest—and following Cohen (1992) a large — effect on acquiescence was estimated for the country's corruption level ( $\eta = 0.473$ ): The higher the level of corruption, the greater was the tendency toward acquiescence in that country. A country's level of collectivism also had a large effect on acquiescence ( $\eta = 0.187$ ): The more collectivistic the country, the higher was the overall tendency to acquiesce. In addition to the country's cultural orientation, the individual's degree of conservatism was the strongest predictor of acquiescence at the individual level ( $\eta = 0.045$ ) although this effect was small to moderate in size. Further variance in acquiescence could be explained by the individual's level of education ( $\eta = 0.029$ ). Thus, at the individual level, respondents with a low degree of conservatism and with a lower level of educational attainment exhibited a higher tendency toward acquiescent responding. Most likely due to the large sample size, the effect of age and gender was also statistically significant. However, age contributed only marginally ( $\eta = 0.004$ ) to explaining the variance in our model, and gender did not explain a substantial portion of the variance at all. Overall, at respondent level, education, age, gender, and degree of conservatism explained 10% of acquiescent responding, and at country level, wealth, degree of collectivism, and corruption level explained 74% of acquiescent responding.

To ensure that our results were not due to capitalizing on chance and that they were not biased by the correlation between GDP, collectivism, and conservatism at the country level, in particular, we conducted a set of robustness checks. First, we cross-validated the results of the multilevel analyses by randomly splitting each country sample into two subsamples and then replicated the analyses for both splits. The pattern of

**Table 2**  
Acquiescence regressed on country-level and respondent-level predictors.

Level	Predictor	Regression coefficient (b)	p Value	Partial variance explained at country level	Partial variance explained at respondent level
Country	GDP	0.013	0.450	0.000 <sup>b</sup>	0.000
	Collectivism	0.002	0.041	0.187	0.000
	Corruption <sup>a</sup>	0.039	0.001	0.473	0.000
Respondent	Education	-0.043	<0.001	0.176	0.029
	Age	0.001	<0.001	0.000 <sup>b</sup>	0.004
	Gender	-0.010	0.002	0.000 <sup>b</sup>	0.000
	Conservatism	0.073	<0.001	0.085	0.045
Complete model				0.737	0.097

<sup>a</sup> For the regression analysis, the corruption index was multiplied by  $-1$ , so that a high value on the corruption scale corresponds to a high level of corruption in the country. Gender: 1 = male, 2 = female. Variance explained at country level was calculated as  $[\nu_{0j}(\text{without predictor}) - \nu_{0j}(\text{with predictor})] / \nu_{0j}(\text{without predictor})$ . Variance explained at respondent level was calculated as  $[\varepsilon_{ij}(\text{without predictor}) - \varepsilon_{ij}(\text{with predictor})] / \varepsilon_{ij}(\text{without predictor})$ .

<sup>b</sup> Values <0 were fixed to 0.

results was very similar for both splits, which suggests no effect of capitalization on chance (see Table S3). In addition, we investigated the biasing effect of the intercorrelations of our predictors at the country level. We therefore excluded each of these three variables in turn from the analyses. The pattern of the results was highly comparable to that originally found (see Table S4). We also investigated whether the association between acquiescence and age, gender, education, or conservatism differed between countries and specified the associations as random effects which did not change the pattern of results (all  $\Delta\beta < 0.002$ ). Finally, we also investigated whether our measure of acquiescence and our conservatism measure were invariant across countries. In particular, we investigated configural invariance (same factor structure), metric invariance (same factor loadings), and scalar invariance (same factor loadings and same intercepts) with multi-group structural equation models. The metric invariance models showed acceptable model fits ( $RMSEA < 0.07$ ,  $SRMR \leq 0.05$ ), whereas the scalar invariance model revealed a poor model fit for both scales ( $RMSEA > 0.11$ ,  $SRMR > 0.10$ ). Likewise, the change in  $RMSEA$  ( $\Delta RMSEA < 0.015$ ) and  $SRMR$  ( $\Delta SRMR < 0.030$ ) also suggest accepting metric invariance for both scales (Chen, 2007).<sup>2</sup>

### 4. Discussion

The aim of the present study was to develop and test a comprehensive model encompassing individual-level determinants and country-level predictors of the tendency toward acquiescent responding in surveys.

Our results corroborate systematic differences in acquiescence between countries: 15% of the variance in acquiescence could be explained by country differences, while the remaining 85% was due to individual variations among the respondents within countries. Thus, the European countries included in our study differed substantially in their tendency toward acquiescence. With our set of predictors we were able to explain three-quarters of the country-level differences. The most central indicator explaining these differences in acquiescence between countries was the corruption level of the respective countries, followed by differences in their respective cultural orientations. The higher the corruption level and the level of collectivism of a country, the greater was the overall

<sup>1</sup> Even though these reliability estimates are too low to make inferences about individual respondents, they are in line with previous research (e.g., Danner et al., 2015) and thus can be seen as sufficient for regression analyses.

<sup>2</sup> We did not use  $\chi^2$ -difference tests because in large samples (as the ESS) the  $\chi^2$ -difference test is likely to be statistically significant even if the magnitude of the differences is not meaningful.

tendency to acquiesce. By contrast, the economic wealth of the country had no significant additional effect on acquiescence. These results support Meisenberg and Williams' (2008) assumption that people living in corrupt societies are more subservient to powerful others. However, it has to be kept in mind that the present study investigated only European and thus comparatively wealthy countries. It needs, therefore, to be investigated in future studies if economic wealth has an additional effect on acquiescence based on a more heterogeneous set of countries.

Individual indicators such as educational level and degree of conservatism differed systematically across the countries and thus contributed to the explanation of the between-country differences in this response style.

Moreover, besides these differences between countries, our results revealed systematic differences between subpopulations: Some subpopulations within countries were more prone to acquiescence than others. Ten percent of these individual differences could be explained by our set of predictors. In line with previous research (e.g., Narayan & Krosnick, 1996; Rammstedt et al., 2010), our results revealed that—across all countries—individuals with lower levels of educational attainment and less conservative individuals were more prone to acquiescent responding than higher educated and more conservative individuals.

In contrast, the effect reported in earlier studies (see Weijters et al., 2010) that females have, on average, a higher tendency toward acquiescence could not be replicated. Rather, we found a statistically significant but not substantial effect of gender that indicated a slightly greater tendency toward acquiescence on the part of males compared to females.

Earlier findings with regard to the effects of age on acquiescence were inconsistent. While some studies suggested that older individuals have a greater tendency toward acquiescence (e.g., Meisenberg & Williams, 2008; Weijters et al., 2010), others identified no substantial effect of age (e.g., Eid & Rauber, 2000). Our results support these albeit somewhat contradictory findings insofar as we found a small statistically, but not practically, significant effect of age in the suggested direction.

In sum, our results support the notion that the corruption level and the cultural orientation of a country, in particular, explain cross-national differences in acquiescent responding. Taking these indicators into account, the economic wealth of a country was not found to contribute to the explanation of cross-national differences. This contrasts with findings of previous studies that did not control for other indicators.

Overall, our study substantially contributes to an understanding of cross-national differences in acquiescent responding. Systematic cross-national response artifacts, as detected in our study, may be misinterpreted as substantive differences across countries or cultures. Therefore, before drawing any conclusions from cross-national surveys, due caution should be taken to reduce acquiescence ex ante (e.g., by using balanced scales; Billiet & McClendon, 2000) or to control for acquiescence ex post (e.g., by using ipsatized data; Brown & Maydeu-Olivares, 2011). Typical areas of application for such ex-ante or post-hoc measures aimed at reducing acquiescence are all questionnaire-based data collections performed in multinational, multicultural, and multiregional contexts. Examples include, but are not limited to, international employee surveys (e.g., Johnson et al., 2005), cross-national media usage studies (e.g., Kuru & Pasek, 2016), and cross-cultural health surveys (Shavitt et al., 2016). In all these areas, variations in acquiescence carry the danger of being misinterpreted as differences in organizational commitment, media exposure habits, or health-related compliance. Therefore, mindfully considering and correcting for acquiescence should yield a more accurate picture about 'true' differences, and help to prevent deriving inappropriate subsequent measures.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.paid.2016.11.038>.

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