**Electronic Supplementary Material**

More demographics: Income, M = 5.4, SD = 2.99, in national deciles, reported by 739 respondents. Education, M = 2.58, SD = 0.89, from 1 = "primary school" to 5 = "doctoral degree", n = 866.

**Structural validity of the five-factor model and alternatives**

For the standard five-factor model $M_{5F}$ (see Figure S1), the fit was somewhat poor. Especially the judgment items fit very badly, with loadings as low as .09 (item RIC in Fairness), and most of these items loading lower than .50, with only the Sanctity judgment items higher than that. To investigate the source of misfit, we tested two alternative structures, modifying the model post-hoc. Following Weber and Federico (2013) and Zhang and Li (2015), we tested a reduced model by removing all the judgment items. RMSEA did not improve from the original for this model $M_{rel}$ (Figure S2; see Table S1). The two-factor model with only individualizing and binding latent variables, despite of being closest to the two-dimensional models of political orientation, had the poorest fit of the all tested models.

The other alternative model was based on the modification indices which showed high correlations between item error terms, implying that the latent factor structure was not the expected one. Thus, we constructed a new model by separating items with the highest error term intercorrelations as their own factors, ultimately ending up with a nine-factor model $M_{9F}$, in which Sanctity was divided into three factors (Religiosity clearly characterizing one factor with the other two less clear, named tentatively here as Decency and Unnaturalness), items related to own country were separated from Loyalty as Patriotism with one item from Authority, and Fairness and Harm relevance items acted separately from the judgment items of each that form a cross-foundation factor Individualizing Judgment (see Figure S3). The fit for $M_{9F}$, compared to that of $M_{5F}$, was considerably better in terms of RMSEA.

Table S1. Fit indices for alternative models of Moral Foundations Questionnaire and its predictors

| | $\chi^2$ | $df$ | CFI | RMSEA | 90% CI | Description |
|---|---|---|---|---|---|---|
| **Alternative measurement models** | | | | | | |
| $M_{5F}$ | 2506.078 | 395 | 0.749 | 0.078 | [.075, .081] | Established five-factor model |
| $M_{2F}$ | 2695.578 | 404 | 0.728 | 0.081 | [.078, .084] | Two-factor model, indiv & bind only |
| $M_{rel}$ | 460.756 | 79 | **0.923** | 0.074 | [.067, .080] | Five-factor model without judgment items |
| $M_{9F}$ | 1495.103 | 369 | 0.866 | **0.059** | **[.056, .062]** | Custom-made nine-factor model |
| **Models of the MFQ and one or two political orientation self-placements (based on $M_{5F}$)** | | | | | | |
| $M_{LR}$ | 3120.906 | 460 | 0.71 | 0.082 | [.080, .085] | Left-right predicting latent MFs |
| $M_{LC}$ | 2907.008 | 460 | 0.733 | 0.079 | [.076, .082] | Liberal-conservative predicting latent MFs |
| $M_{both}$ | 2801.581 | 445 | **0.744** | **0.078** | **[.075, .081]** | Both political orientations predicting latent MFs |
| **Models of the MFQ, both political orientations, and demographics** | | | | | | |
| $M_{demo}$ | 3299.039 | 570 | 0.734 | 0.074 | [.072, .077] | $M_{both}$ with demographics |
| $M_{9F\text{-}demo}$ | 2017.214 | 516 | **0.854** | **0.058** | **[.055, .060]** | $M_{both}$ with demographics and $M_{9F}$ as a measurement model |

Note. CFI = comparative fit index, reported here for the sake of completeness (but see text and Kenny, 2015, for argument that this index is misleading); RMSEA = root mean square error approximation; 90% CI = confidence interval for RMSEA. The best index in group indicated by bold font.

Figure S1. Moral Foundations Questionnaire confirmatory factor analysis of the full five-factor model $M_{5F}$. Item abbreviations are drawn from Graham et al. (2011). All loadings are standardized, and the values next to error terms represent item variance explained by the model ($r^2$).
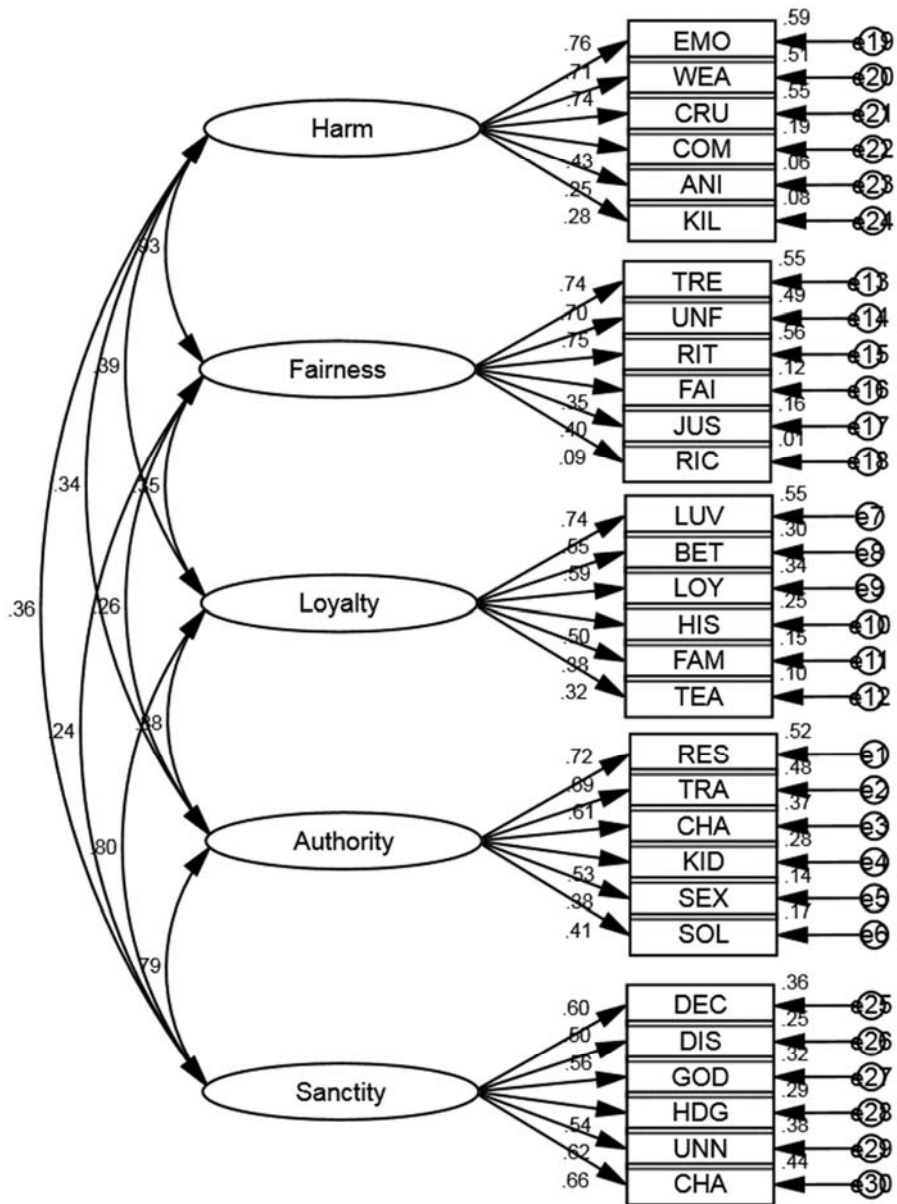
Figure S2. Moral Foundations Questionnaire confirmatory factor analysis of the reduced model $M_{rel}$ without the judgment items.
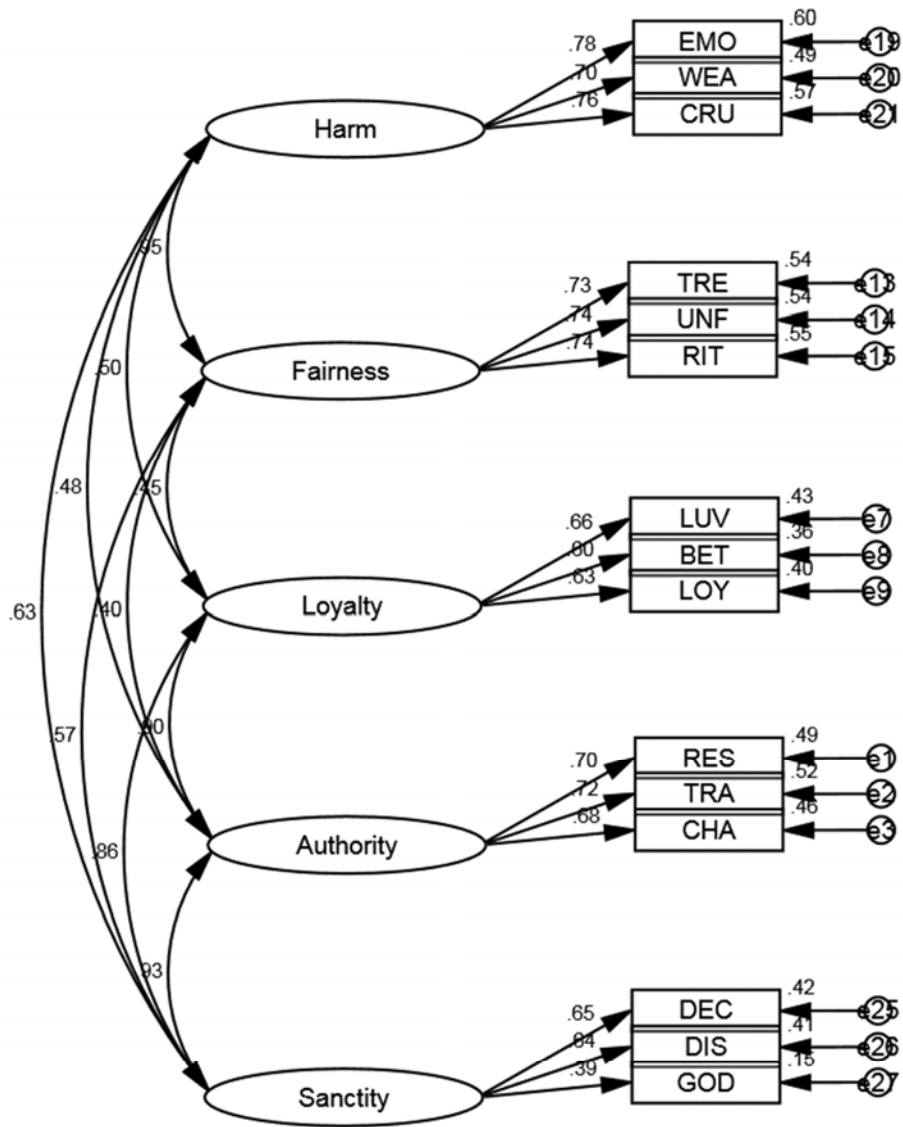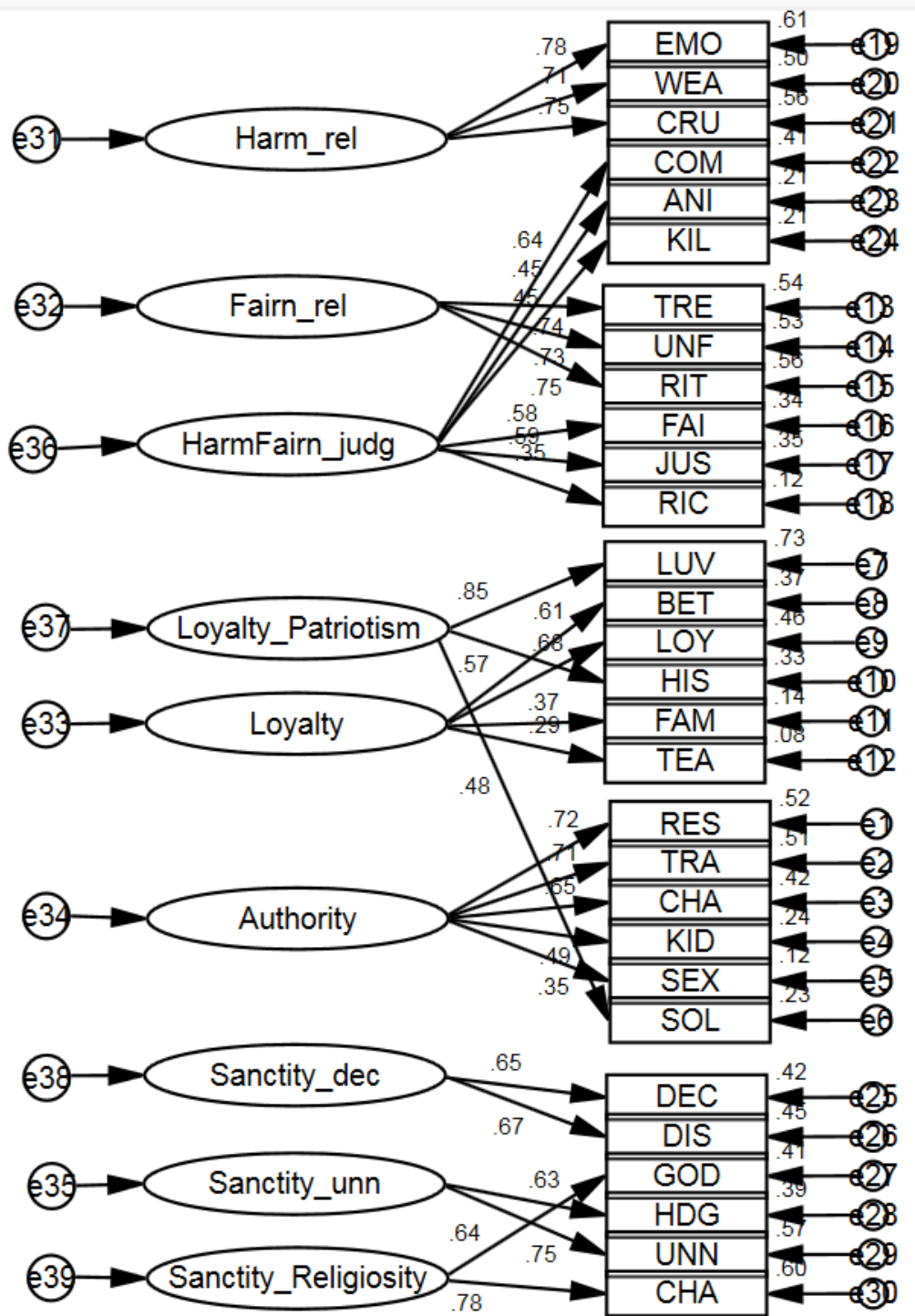
Figure S3. Moral Foundations Questionnaire model M$_{F9}$ with new factors created according to covariances between item error terms.

**Modeling MFQ with political orientation labels and demographic variables**

To see how the interest in politics and demographic variables (gender, age, education, and income) contribute, we added them to $M_{both}$ as exogenous variables to construct the model $M_{demo}$, shown in Figure 3. Liberal-conservative measure was associated to Loyalty, Authority, and Sanctity (standardized loadings from .37 to .52, $ps < .001$), but not to Harm ($p = .780$), and at most very weakly to Fairness (with loading -.10, $p = .007$). For the "left-right" label, the loadings were lower (from .20 to .07), but significant ($p < .001$) in all cases but Sanctity ($p = .042$).

Age and gender were on par with Left-right measure, age with loadings to all moral foundations (from .14 to .27, $ps < .001$) except Authority, and female gender increasing Harm, Fairness, and Sanctity (.32, .24, and .12, $ps < .001$). Education and income were found to have very weak or no associations to any of the moral foundations (loadings at most at .08, all $ps > .07$). Interest in politics was only weakly related to Harm and Fairness (.10 and .13, $p = .007$ and $p < .001$, respectively). Interest in politics was only weakly related to Harm and Fairness (.10 and .13, $p = .007$ and $p < .001$, respectively).

However, the variances explained by the model are still rather small for Harm and Fairness ($r^2s = .19$ and .13), and small to moderate for the other foundations ($r^2s = .30, .28$, and .43 for Loyalty, Authority, and Sanctity, respectively).

Figure S4. Model M<sub>demo</sub>, including all demographic variables.
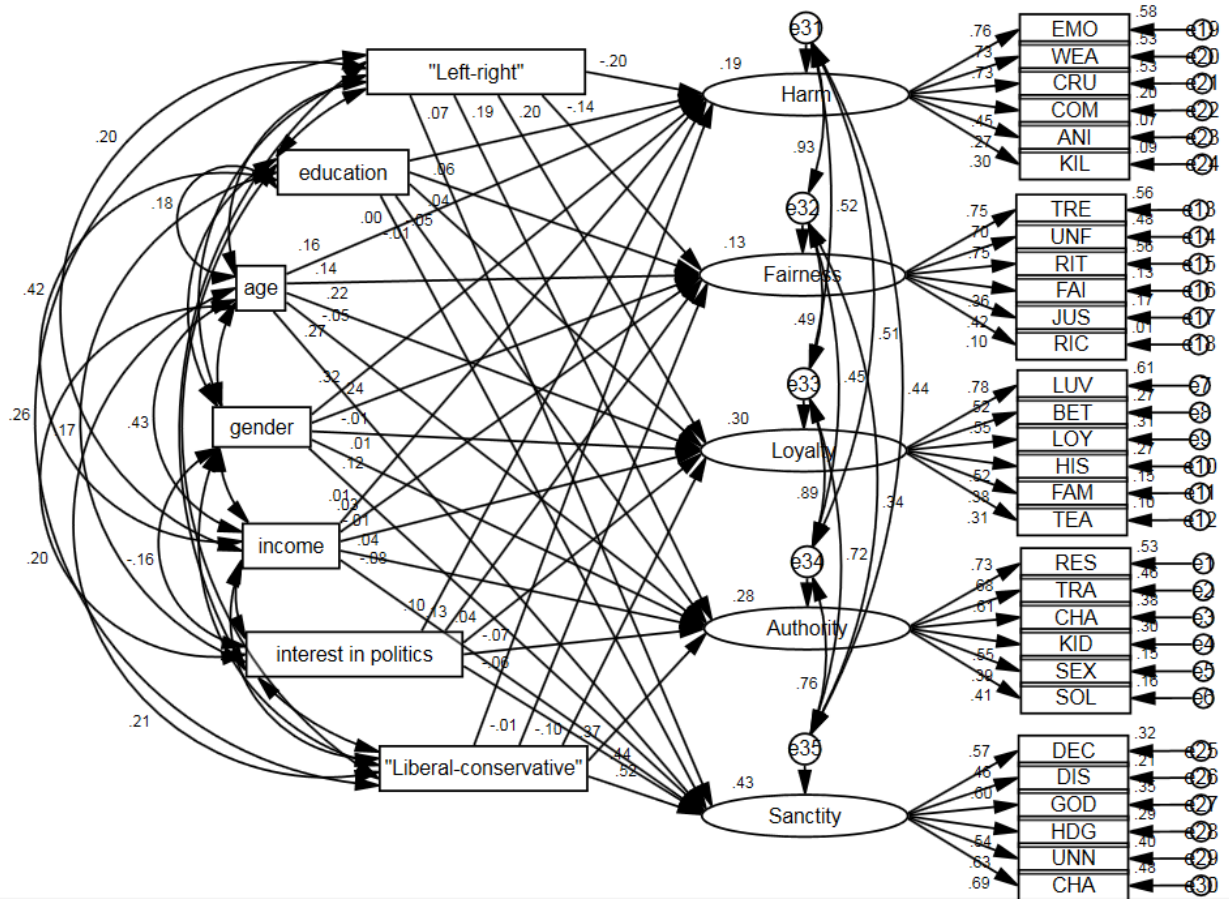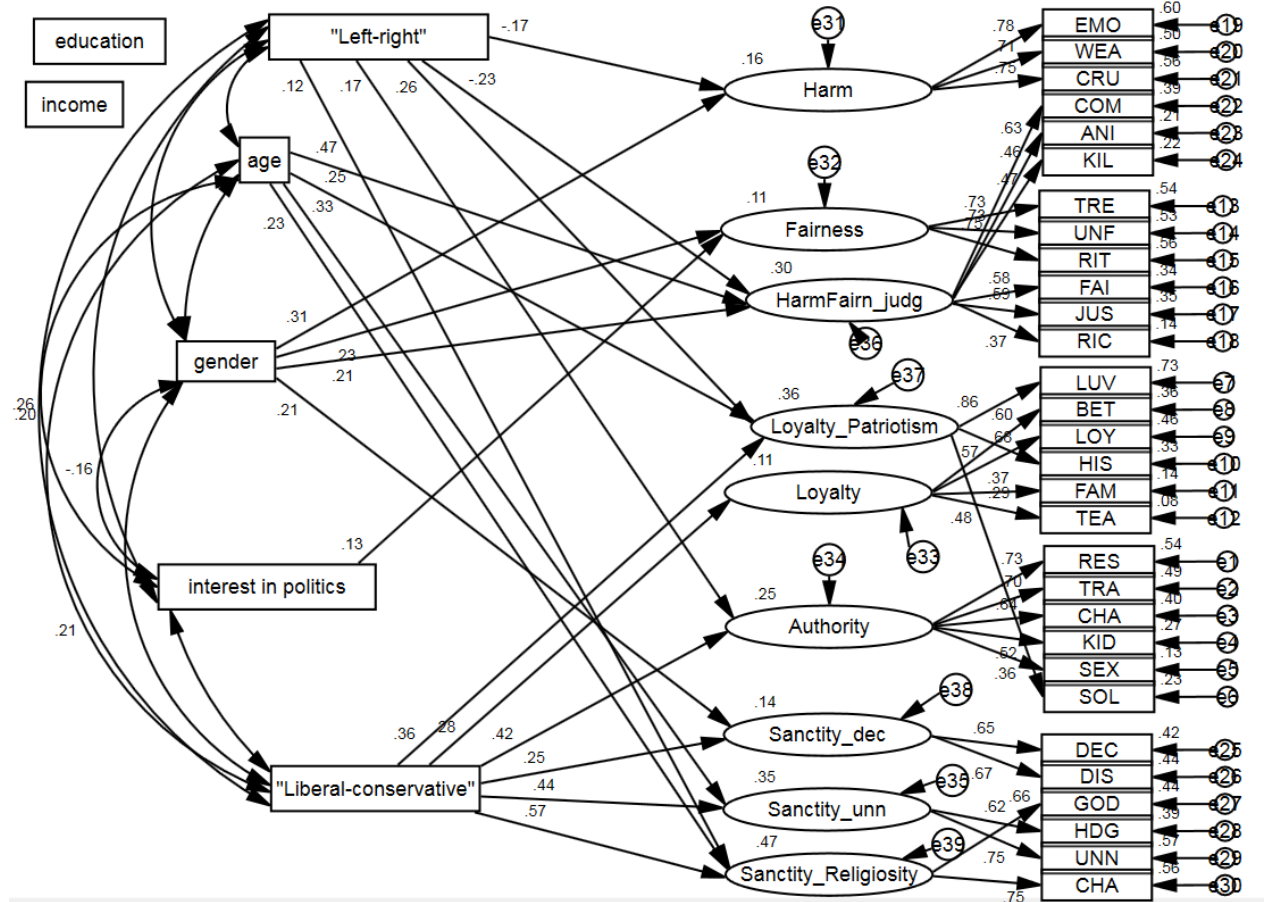
Figure S5. Model M$_{9F\text{-demo}}$ showing only significant ($p < .001$) effects. Education and income are still retained in the model, even though they do not have any significant effects.



We also specified a hierarchical model with the two higher-order factors, individualizing and binding, predicting the five latent MFs, but it resulted in a non-usable model that did not converge correctly (Heywood case). Thus, this model is not used further.

Although the associations between the variables do not dramatically change with our alternative models, our analyses indicate that in fact the fit of the five-factor model was rather poor in our sample. The simple removal of the low-loading (judgment) items was one solution, but we also found that a more complex nine-factor model had a better fit than the established five-factor model. As other studies (e.g. Federico, Weber, Ergun, & Hunt, 2013; Nilsson & Erlandsson, 2015) have also reported high intercorrelations between item error terms, this suggests that the established

structure (with all items) is likely too simple. In fact, similar issues have been reported rather often in earlier studies: low Cronbach's alphas and item loadings and/or poor model fits are reported at least in Graham et al. (2011), Glover et al. (2014), Federico et al. (2013), Nilsson and Erlandsson (2015), Bobbio et al. (Bobbio, Nencini, & Sarrica, 2011), Kim et al., (2012), and Zhang and Li (2015). Although the somewhat poor psychometric properties can be justified by theoretical comprehensiveness (see Graham et al., 2011), Nilsson and Erlandsson (2015) note that model fits are poor particularly for translations of the MFQ into other languages than English, which may suggest that at least some of the items are culturally dependent (a point raised also by Zhang & Li, 2015; see also Kim et al., 2012).

As a side note, this being a cross-sectional study, we cannot say much about the direction of any effects. We followed the structural model reported by Graham et al. (2009) in that ideology is assumed to predict moral foundations. This direction is also supported by Federico and others (2013), but theoretically, given that political orientation dimensions are very high-level abstractions, originating from a variety of psychological processes (of which, for instance, Authoritarianism and SDO might be part; Duckitt & Sibley, 2009), and the processes behind moral foundations are also theorized to be partly genetic (Haidt, 2012), it is likely that both political orientation and MFs are influenced by some more basic sources. Considering the modularity brought up by Graham and others (2013), the moral modules are probably not singular units but further comprise smaller modules such as recognition of intentionality (Decety & Cacioppo, 2012) and attribution of harm (Gray, Schein, & Ward, 2014). More experimental research is needed for finding out the real structure of these possible moral modules.

**Comparisons of low and high interest in politics**

Considering that both Feldman (2013) and Jost et al. (2009) mention that political engagement increases alignment between political dimensions, we examined the effects of a measure of interest in politics in our sample. We compared the correlations between liberal-conservative and left-right measures in high and low-interest groups (data split in half at the midpoint of the scale: 381 low-interest, 493 high-interest cases). The correlation between the labels was .21 [.12, .29] in the low-interest, and .29 [.21, .37] in the high-interest group, indicating a possible small effect in the expected direction, but with very weak confidence.

The liberal-conservative measure, in the low-interest group (and using the $M_{LC}$ model), did not explain Harm or Fairness at all ($r^2 = .00$, upper bounds .02 at maximum) and explained the binding foundations weakly (Loyalty, $r^2 = .00$ [.04, .26]) to moderately (Sanctity, $r^2 = .29$ [.16, .43]), while in the high-interest group the measure explained Harm and Fairness not much better (upper bounds = .05 for Harm, .11 for Fairness) but binding foundations moderately ($r^2$s = .27, .26, .41, for Loyalty, Authority, and Sanctity, with lower bounds at minimum = .15, upper bounds at maximum = .52). The left-right measure explained, in the low-interest group (and using the $M_{LR}$ model), practically nothing of the individualizing foundations or Sanctity ($r^2 = .01$, upper bounds around .06 to .08) and only a bit more of the Loyalty and Authority (lower bound of < .01, upper bounds at maximum = .14), while for the high-interest group, the label explained a little more of Harm, Fairness, and Sanctity (from lower bounds = .01 or .02 to upper bounds = .16), and for Loyalty and Authority ($r^2$s = .12, with lower bounds at minimum = .4, and upper bounds at maximum = .22). The detailed explained variances of these models and of $M_{both}$ are reported below in Table S2. Although these comparisons do not give high confidence on the 99 % level, this suggests that the political orientation of those who are more interested in politics may show higher

consistency in respect to the moral foundations. In addition, as the high-interest respondents were more consistent and/or extreme in their responses to MFQ, it suggests that volunteer samples—assuming that they draw more interested people to studies—may have somewhat inflated associations compared to a representative sample.

Table S2. $r^2$ estimates for low- and high-interest groups in three different models, by MF.

Low-interest $M_{LC}$

| Parameter | Estimate | Lower | Upper | P |
|---|---|---|---|---|
| Sanctity | .287 | .160 | .427 | .001 |
| Harm | .001 | ... | .020 | .011 |
| Fairness | .000 | ... | .008 | .081 |
| Loyalty | .134 | .042 | .262 | .001 |
| Authority | .187 | .079 | .326 | .001 |

High-interest $M_{LC}$

| Parameter | Estimate | Lower | Upper | P |
|---|---|---|---|---|
| Sanctity | .407 | .290 | .522 | .001 |
| Harm | .010 | .000 | .051 | .001 |
| Fairness | .040 | .003 | .109 | .001 |
| Loyalty | .270 | .159 | .397 | .001 |
| Authority | .264 | .149 | .402 | .001 |

Low-interest $M_{LR}$

| Parameter | Estimate | Lower | Upper | P |
|---|---|---|---|---|
| Sanctity | .013 | .000 | .078 | .001 |
| Harm | .008 | .000 | .057 | .001 |
| Fairness | .007 | .000 | .051 | .001 |
| Loyalty | .052 | .003 | .141 | .001 |
| Authority | .059 | .008 | .137 | .001 |

High-interest $M_{LR}$

| Parameter | Estimate | Lower | Upper | P |
|---|---|---|---|---|
| Sanctity | .066 | .015 | .149 | .001 |
| Harm | .085 | .024 | .180 | .001 |
| Fairness | .058 | .008 | .157 | .001 |
| Loyalty | .122 | .037 | .229 | .001 |
| Authority | .123 | .041 | .219 | .001 |

Low-interest $M_{both}$

| Parameter | Estimate | Lower | Upper | P |
|---|---|---|---|---|
| Sanctity | .287 | .158 | .420 | .001 |
| Harm | .011 | .000 | .052 | .007 |
| Fairness | .007 | ... | .039 | .013 |
| Loyalty | .160 | .050 | .285 | .002 |
| Authority | .213 | .091 | .345 | .002 |

High-interest $M_{both}$

| Parameter | Estimate | Lower | Upper | P |
|---|---|---|---|---|
| Sanctity | .414 | .295 | .531 | .001 |
| Harm | .085 | .025 | .176 | .002 |
| Fairness | .077 | .019 | .165 | .002 |
| Loyalty | .315 | .198 | .433 | .001 |
| Authority | .309 | .184 | .443 | .001 |

**Comparisons within political extremes**

Figure S6 displays moral foundation endorsements as a function of left-right orientation (left panel) and liberalism-conservatism orientation (right panel).
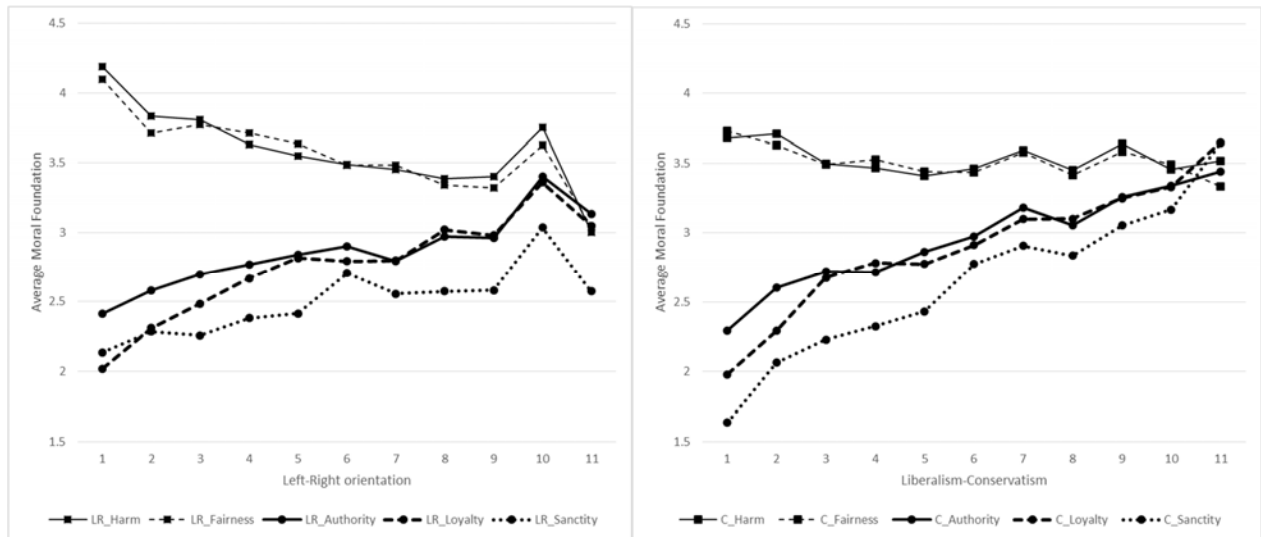


Figure S6. Differences in Moral Foundations endorsements by left-right orientation (left panel) and liberalism-conservatism (right panel). Note the truncated y-axis.

As we noticed from this figure that the differences in the MFs are largely driven by the extreme political orientation scorers, we ran a multigroup comparison between left-wing vs. right-wing respondents, and liberal vs. conservative respondents (both scales were split into two, excluding the middle point). The multi-group comparisons revealed that the demographics have somewhat different effects on the different sides of the ideological divide. The differences are small, but in some cases highly significant at the 99.9% level. Specifically, age increased Harm more for conservatives than liberals (.38 vs. .10; difference between unconstrained model and a model constrained to equal age-Harm coefficient between groups, $\chi^2(1) = 10.653$, $p = .0006$), and for right-wingers but not for left-wingers (.34 vs. .03; $\chi^2(1) = 11.764$, $p = .0003$); age also increased Fairness more for conservatives than liberals (.39 vs. .07; $\chi^2(1) = 13.348$, $p = .0001$). Given that these differences were all related to the individualizing MFs, for which liberals have higher values to

begin with, the age effect is reducing the difference between liberals and conservatives. However, regarding the binding MFs, age also marginally increased Authority for conservatives but marginally decreased it for liberals (.14 vs. -.16; $\chi^2(1) = 10.165$, $p = .0008$), strengthening the ideological divide. Finally, a weaker difference was found in income, which marginally increased Harm in left-wingers (.11), but marginally decreased it in right-wingers (-.19, $\chi^2(1) = 7.783$, $p = .0029$), also exacerbating the difference between the groups.