

Personal Values and Moral Foundations: Examining Relations and Joint Prediction of Moral Variables

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Abstract

I examined the relationship between personal values and moral foundations by conducting a mini meta-analysis of the values–foundations links in five large-scale cross-cultural samples (overall $N = 32,492$). I further tested whether the two theories predicted unique variance in moral variables. I found support for values and foundations as unique constructs with consistent and theoretically meaningful relationships. Broadly, self-transcendence versus self-enhancement values dimensions were associated with individualizing foundations, whereas conservation versus openness-to-change values dimensions were associated with binding foundations. Links between values and foundations categories followed the expected theoretical values theory circumplex structure sinusoidal pattern. Dimensions of the two theories predicted unique variance in morality attitudes, behavior, and individual differences. All materials, data sets, and code are available on <https://osf.io/6qs5g/>.

Keywords

personal values, morality, values, moral foundations

How are long-term motivations related to moral judgments? Researchers studying personal values and moral psychology have made significant advances in recent years toward an overall framework of universal categories that help explain individual differences in personal values and moral judgments. The Schwartz (1992) personal values theory and the moral foundations theory (Graham et al., 2011) emerged as the two most widely used theories in their respective domains. The two theories are commonly used in predicting political orientations and moral judgments and behavior and are both strongly embedded in the social–cultural context, but the two streams of literature remain largely disconnected. Moreover, it has long been theorized that personal values hold conceptual links with morality intuitions (Kohlberg & Hersh, 1977), yet little research has been done to test or map such links. Scholars have only recently begun to theorize on possible links between the two theories (e.g., Sverdlik et al., 2012), and thus far there are only limited theoretical work and empirical evidence on these links.

The aim of the present investigation is to connect between the two streams of literature by testing a model of the relationships between values and foundations and examining whether both theories predict unique variance in moral variables. The empirical test is conducted on five large-scale samples collected by different methods, using a variety of scales, and from diverse contexts.

Personal Values

Personal values are long-term motivational goals reflecting desirable guiding principles of what people consider important in their lives (Rokeach, 1973). The most widely used theory of personal values by Schwartz (1992) groups personal values into 10 value categories of universal meaning which follow a consistent structure of relationships. The theory proposed two bipolar dimensions on a multidimensional circular model (see Figure 1): self-enhancement (power and achievement) versus self-transcendence (benevolence and universalism) and openness-to-change (self-direction and stimulation) versus conservation (tradition, security, and conformity).¹ This theoretical conceptualization of values considers values as part of a complete values system rather than as separate disconnected singular values (Boer & Fischer, 2013; Parks-Leduc et al., 2015; Schwartz, 1992, 1994, 1996). The theorized values

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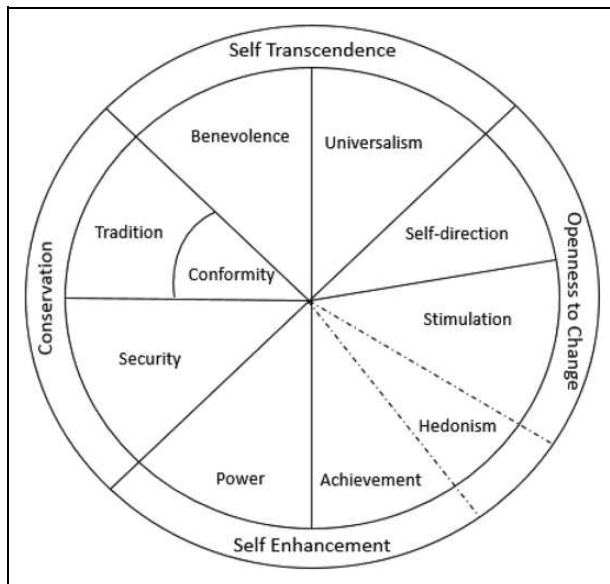


Figure 1. The theoretical structure of personal values.

categories and the mapping of their interdependencies on the circumplex structure have received universal empirical support across more than 70 countries around the world (Davidov et al., 2008; Schwartz et al., 2012; Schwartz & Sagiv, 1995).

Moral Foundations

Moral psychology research has long sought to identify moral categories that would help explain fundamental differences in people's moral judgments (Graham et al., 2009; Haidt & Graham, 2007). The moral foundations theory (Graham et al., 2009, 2011) initially identified five domains of moral judgments, summarized in Table 1. These were used to explain

differences in moral evaluations of people from different cultures and political orientations (Haidt, 2008). Harm–care moral foundation is about the prevention of harm and the promotion of care toward others, fairness–reciprocity moral foundation centers on ensuring the fair treatment of others, in-group–loyalty moral foundation focuses on obligations to the close social group and the promotion of the group's interests, authority–respect moral foundation emphasizes following authority and tradition, and purity–sanctity moral foundation is about chastity and decency. People vary in the extent to which they apply moral foundations in their judgments of morality.

The five foundations are typically mapped onto two high-order dimensions, with harm–care and fairness–reciprocity termed the “individualizing” foundations, often endorsed by political liberals (in U.S. terms), and in-group–loyalty, authority–respect, and purity–sanctity termed the “binding” foundations, often endorsed by political conservatives (Graham et al., 2009, 2011, 2012; Iyer et al., 2012).

Relationship Between Personal Values and Moral Foundations

There has so far been very little theoretical and empirical research on the links between values and foundations. I reviewed this literature and briefly summarized the main insights from each of the identified articles to suggest an integrated model. Graham et al. (2009) introduced the moral foundations theory and aimed to validate structure and scale. In their empirical investigation, they tested the foundations against specific values as an external criterion tapping a similar domain. They reported that benevolence and social justice values showed the strongest relationship with the foundations of harm–care and fairness–reciprocity ($r = .29-.52$). Values of loyalty, national security, family security, social order, authority, respect for tradition,

Table 1. Predictions for the Relationship Between Personal Values and Morality.

Moral Dimension	Moral Foundation	Description	Focus on . . .	Strongest Supporting Values	Strongest Opposing Values	Dominant Values Conflict
Individualizing	Harm/care	The prevention of harm and promotion of care toward others	Emotional suffering and cruelty Caring for the weak and vulnerable	Universalism, benevolence	Power, achievement	SET
	Fairness/reciprocity	Ensuring that others are treated fairly	Similar treatment to all Unfair or unjust actions	Universalism, benevolence	Power, achievement	SET
Binding	In-group/loyalty	Acting with the interests of your social group at heart	Love for own country and/or loyalty to family Group betrayal	Tradition, conformity, security	Self-direction	CO
	Authority/respect	Ensuring respect and preservation of authoritative and traditional structure	Respect for authority Respect for tradition	Tradition, conformity	Self-direction	CO
	Purity/sanctity	The drive or need to avoid contamination and disgust	Violation of purity and decency Chastity and cleanliness	Tradition, conformity	Hedonism, self-direction	CO

Note. SET = self-transcendence versus self-enhancement; CO = conservation versus openness-to-change.

Of the entire sample, 17,350 of the participants choose to answer both the personal values and the moral foundations (6,987 females, 2 unreported).

Measures

All measures and materials are reported in full in the Supplementary material.

Personal values. Personal values in myPersonality and yourmorals.org were measured using the Schwartz Value Survey (SVS; Schwartz, 1992, 1994) that includes 57 values items, each value described with a couple of related abstract key words. The participants were asked to rate how important values are as guiding principles in their lives using a standard 9-point rating scale numbered from -1 to 7 ($-1 =$ *opposed to my values*, $0 =$ *not important*, $3 =$ *important*, $6 =$ *very important*, and $7 =$ *of supreme importance*).

In myType, personal values were measured using the 40-item Portrait Values Questionnaire (PVQ-40; Schwartz et al., 2001) that consists of short verbal statements implicitly pointing to different values by highlighting what those individuals value as important in their lives. As an example, the item “It is important to me to be rich. I want to have a lot of money and expensive things” is indicative of a person valuing power. For each of those descriptions, participants were asked to indicate “How much like you is this person?” on a 6-point scale ($1 =$ *not like me at all*, $6 =$ *very much like me*).

The personal values measure in the SWV was the short SVS (Lindeman & Verkasalo, 2005), which asks participants to directly rank the values categories using a single item (e.g., such as “Power, that is, social power, authority, wealth”) on a scale of -1 to 7 ($-1 =$ *opposed to my values*, $0 =$ *not important*, $3 =$ *important*, $6 =$ *very important*, and $7 =$ *of supreme importance*).

Participants in MM completed a short 21-item version of the PVQ-40 (Schwartz et al., 2001) and devised for the European Social Survey (PVQ-21; see Schwartz, 2003). I followed the standard recommended procedure for analyzing values scales. In all measures, scores for value categories and high-order value dimensions were mean-centered (Parks-Leduc et al., 2015; Schwartz, 2009).

Moral foundations. Participants in yourmorals.org, myPersonality, and myType completed the 32-item MFQ (Graham et al., 2009) that includes two subscales asking about the relevance of moral concerns ($0 =$ *not at all relevant*, $5 =$ *extremely relevant*) and agreement with statements about moral intuitions ($0 =$ *strongly disagree*, $5 =$ *strongly agree*). The SWV measured foundations using the 22-item shortened version of the MFQ (Graham et al., 2011). Participants in yourmorals.org could also answer the Moral Foundations Sacredness Scale (MSS; Graham & Haidt, 2012) that asks about the required monetary compensation for undertaking immoral actions ($1 =$ *for free*, $2 =$ $\$10$, $3 =$ $\$100$, $4 =$ $\$1,000$, $5 =$ $\$10,000$, $6 =$ $\$100,000$, $7 =$ *a million dollars*, and $8 =$ *never for any amount of money*) used

as a proxy for importance given to moral concerns. For example, “Curse your parents, to their face (You can apologize and explain 1 year later)” is an item measuring authority/respect foundations and “Kick a dog in the head, hard” is an item measuring the harm/care foundations. Participants in MM completed a short 18-item version of the MSS (Graham & Haidt, 2012).

Morality variables. MM data set included moral measures I used to test the incremental predictive validity of personal values versus the moral foundations. Specifically, I examined one classic moral decision vignette measuring moral attitudes—Heinz and the Drug, a game theory behavioral moral dilemma—the dictator game, and one Morality Trait Scale—moral identity (Aquino & Reed, 2002). Previous literature has theorized, discussed, and tested associations between these morality variables and both values (e.g., morality trait: Frimer & Walker, 2009; moral dilemma: Lönnqvist et al., 2013, 2014; moral attitudes and attitudes: Boer & Fischer, 2013; Feldman et al., 2015) and foundations (e.g., morality trait: Smith et al., 2014; moral dilemma: Schier et al., 2016; moral attitudes: Djeriouat & Trémolière, 2014). Materials are provided in the Supplementary material.

Results

I conducted a mini meta-analysis on the five samples regarding the relationship between the 10 personal values and the 5 moral foundations, with analyses of the values high-order dimensions and the categories circumplex sinusoidal patterns. Reporting focuses on the meta-analytic summary, yet descriptives and findings for each of the individual samples can be found in the Supplementary material. I then examined whether personal values and the moral foundations high-order dimensions accounted for unique variance in the prediction of morality variables.

Values and Foundations as Unique Constructs

I first begin with an exploratory and confirmatory factor analysis to examine whether the high-order dimensions can be regarded as unique latent constructs. The Yourmorals data set was used for the factor analyses as it had the largest sample population from a single culture (17,000+ Americans) and employed the most comprehensive and well-validated measures of personal values (SVS-57) and the moral foundations (MFQ-32).

I first conducted an exploratory factor analysis (EFA) to examine which high-level dimensions would emerge from these factors. The values theory (Schwartz, 1992) was first theorized and tested using multidimensional scaling (MDS) in order to establish the interrelationships among values and tension between the two high-order dimensions. I note that this introduces some challenges in conducting exploratory and confirmatory factor analysis (explained in detail in Schwartz &

Table 2. Personal Values and Moral Foundations Mini Meta-Analytic Effects.

Personal values	Power		Achievement		Hedonism		Stimulation		Self-Direction	
Harm–Care	–.23		–.15		–.13		–.08		–.06	
95% CI	–.34	–.12	–.25	–.05	–.18	–.07	–.14	–.03	–.18	.06
Fairness–reciprocity	–.21		–.12		–.11		–.07		–.01	
95% CI	–.28	–.14	–.20	–.04	–.17	–.06	–.11	–.03	–.12	.11
In-group–loyalty	–.03		–.06		–.16		–.12		–.21	
95% CI	–.17	.11	–.14	.01	–.21	–.11	–.15	–.09	–.31	–.10
Authority–respect	–.03		–.08		–.19		–.17		–.25	
95% CI	–.17	.12	–.15	.00	–.25	–.13	–.23	–.12	–.37	–.13
Purity–sanctity	–.05		–.07		–.20		–.17		–.24	
95% CI	–.12	.02	–.11	–.03	–.33	–.05	–.26	–.08	–.37	–.09
	Universalism		Benevolence		Tradition		Conformity		Security	
Harm–care	.24		.19		.08		.07		.00	
95% CI	.04	.41	.14	.24	.02	.14	–.03	.16	–.13	.14
Fairness–reciprocity	.24		.15		.03		.05		.02	
95% CI	.05	.41	.11	.19	–.10	.16	–.10	.19	–.11	.15
In-group–loyalty	–.15		.06		.23		.23		.19	
95% CI	–.30	.02	–.04	.15	.17	.28	.12	.34	.07	.31
Authority–respect	–.14		.04		.27		.30		.19	
95% CI	–.33	.05	–.05	.12	.16	.37	.13	.46	.02	.35
Purity–sanctity	–.14		.06		.30		.26		.17	
95% CI	–.28	–.01	–.02	.13	.14	.45	.08	.43	.08	.27

Note. Boldface values represent values–foundations correlations that were consistent and significant across all samples. Meta-analytic effects are using Schulze (2004) and take into account sample size.

Boehnke, 2004), especially together with other constructs that treat dimensions as orthogonal.

I ran an EFA on the personal values categories, with very simple structure and parallel analysis, and two factors emerged that matched well with the values theory two high-level dimensions. I continued to rerun the same analyses with moral foundations included. Three factors emerged, with the previous factor loadings unchanged and all the moral foundations falling on the third factor. MDS analyses revealed that the individualizing moral foundations were positioned close to self-transcendence values and furthest from self-enhancement values, whereas the binding moral foundations were positioned close to the conservation values and furthest from the openness-to-change values. Eigenvalues scree, factor loadings, and MDS plots are provided in the Supplementary material.

The analysis supported the distinction between the personal values and the moral foundations dimensions. I then proceeded to conduct a confirmatory factor analysis comparing different possible models, again focusing on how personal values and moral foundations categories map onto the higher level constructs. This was modeled after the method by Schwartz and Boehnke (2004).

I compared several models: (1) one-factor model; (2) two factors—values and moral foundations; (3) two factors—binding with openness-to-change/conservation and individualizing with self-enhancement/self-transcendence; (4) three factors—binding with openness-to-change/conservation, individualizing, and self-enhancement/self-transcendence; (5) three factors—individualizing with self-enhancement/self-transcendence,

binding, and openness-to-change/conservation; and (6) four separate factors—individualizing, self-enhancement/self-transcendence, binding, and openness-to-change/conservation.

The four-factor model emerged as the superior model and had the best fit with the data. Detailed model plots and fit comparisons are provided below. I concluded support for the personal values and the moral foundations high-order dimensions as unique constructs.

Mini Meta-Analytic Effects

I conducted a mini meta-analysis (Goh et al., 2016) of the included samples and determined the meta-analytic effects and confidence intervals for the correlations between personal values and the moral foundations. The meta-analytic estimates using Schulze (2004) DerSimonian–Laird method are provided in Table 2 and plotted in Figure 3. There was an overall high consistency between the samples. Of the 50 possible correlations (10 values \times 5 foundations), 31 correlations were in the same direction across all samples. Additional analyses of mini meta-analytic effects with reliability corrections are provided in the Supplementary material, and the results were very similar, though with much larger effects for the corrected estimates.

Openness-to-change values dimension includes stimulation, self-direction, and hedonism. Hedonism values were negatively correlated with all foundations ($\bar{\rho}$ = $-.11$ to $-.20$), stimulation values were negatively correlated with fairness–reciprocity ($\bar{\rho}$ = $-.07$), in-group–loyalty ($\bar{\rho}$ = $-.12$), authority–respect ($\bar{\rho}$ = $-.17$), and purity–sanctity ($\bar{\rho}$ = $-.17$), and self-direction values

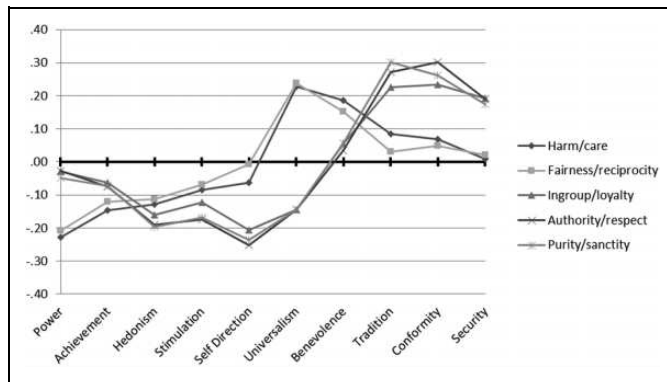


Figure 3. Personal values and moral foundations mini meta-analytic effects plot.

correlated negatively with in-group-loyalty ($\bar{\rho} = -.21$), authority-respect ($\bar{\rho} = -.25$), and purity-sanctity ($\bar{\rho} = -.24$).

On the opposite values dimension of conservation are tradition values, conformity values, and security values. All of the conservation values were positively correlated with the binding foundations of in-group-loyalty ($\bar{\rho} = .19-.23$), authority-respect ($\bar{\rho} = .19-.30$), and purity-sanctity ($\bar{\rho} = .17-.30$).

Meaning, that the tension between openness-to-change and conservation values was mainly reflected in concerns regarding in-group-loyalty, authority-respect, and purity-sanctity. The binding moral foundations were associated with lower openness-to-change values and higher conservation values.

For the self-transcendence values dimension, universalism values and benevolence values were positively correlated with harm-care ($\bar{\rho} = .24$ and $.19$, respectively) and fairness-reciprocity ($\bar{\rho} = .24$ and $.15$, respectively), with universalism also showing negative correlations with purity-sanctity ($\bar{\rho} = -.14$). On the opposite values dimension of self-enhancement, power values and achievement values were negatively correlated with harm-care ($\bar{\rho} = -.23$ and $-.15$, respectively) and fairness-reciprocity ($\bar{\rho} = -.21$ and $-.12$, respectively). Meaning, the tension between self-enhancement and self-transcendence was mainly reflected in the concerns regarding harm-care and fairness-reciprocity foundations. The individualizing moral foundations were associated with higher self-transcendence values and lower self-enhancement values.

Fit With Theoretical Model

Figure 3 plots the meta-analytic effects of values and foundations on a graph with values listed on the horizontal axis in order following the values theory circumplex structure. The plot clearly shows the sinusoidal pattern of correlations predicted by the values theory for all five moral foundations.

The summary of consistent values-foundations links above provides descriptive results in line with the theorized model in Figure 2. I therefore proceeded to empirically test how well the results fit the suggested model. Specifically, I examined which of the two high-order values dimensions, self-enhancement

	SET-Shape	CO-Shape
Power	−0.95	0.59
Achievement	−0.95	0
Hedonism	−0.59	−0.59
Stimulation	0	−0.95
Self-direction	0.59	−0.95
Universalism	0.95	−0.59
Benevolence	0.95	0
Tradition	0.59	0.59
Conformity	0	0.95
Security	−0.59	0.95

Figure 4. The shape consistency equation (Boer & Fischer, 2013) and the shape consistency vectors table; x represents the actual correlations vector, y represents the expected sinusoidal pattern vector ($SD(y) = .75$), and n is the number of effects ($= 10$ values).

versus self-transcendence or openness-to-change versus conservation, were more central and showed a stronger contrast in predicting foundations. I did so by testing the strength of the sinusoidal patterns using the shape consistency method devised by Boer and Fischer (2013). Shape consistency is defined as the extent to which an observed value correlations pattern maps onto a sinusoidal shape emphasizing either the self-enhancement versus self-transcendence dimensions (SET-shape) or the conservation versus openness-to-change dimensions (CO-shape; effect sizes: 0.4—weak consistency, 0.6—moderate consistency, 0.8—strong consistency). So, for example, a strong CO-shape consistency means that there is a high contrast between the correlations of conservation and openness-to-change values. A weak SET-shape consistency means that the contrast between the correlations of self-enhancement versus self-transcendence was rather weak. Figure 4 details the shape consistency equation and calculations table. When contrasting the two shape consistencies, a dominant SET-shape means that the contrast between self-enhancement and self-transcendence is stronger than that of conservation versus openness to change, whereas a dominant OC-shape indicates the opposite.

$$r(xy) = \frac{\sum x(i)y(i) - nxy}{(n-1)sd(x)sd(y)},$$

The results of the shape consistency analyses are detailed in Tables 3 (meta-analytic summary) and 4 (with detailed effects for each sample). Harm-care and fairness-reciprocity foundations showed a strong dominant SET-shape consistency (.83 and .84, respectively). An opposite pattern emerged for in-group-loyalty, authority-respect, and purity-sanctity foundations, showing a strong dominant CO-shape consistency (.89, .90, and .87, respectively).

Incremental Predictive Validity

I followed the method by Graham et al. (2011) and used a two-step regression approach to test whether personal values and the moral foundations explained unique variance in predicting

Table 3. Values Theory Sinusoidal Shape Consistency Effects for Morality.

Moral foundations	SET	CO	Dominant
Harm–care	.83***	.07	SET
Fairness–reciprocity	.84***	–.05	SET
In-group–loyalty	.00	.89***	CO
Authority–respect	.00	.90***	CO
Purity–sanctity	.06	.87***	CO

Note. SET-shape (self-transcendence vs. self-enhancement) and CO-shape (conservation vs. openness-to-change) values were adapted from Boer and Fischer (2013). Consistency effect size guide: 0.4—low (*); 0.6—moderate (**); 0.8—strong (***). SET = self-transcendence versus self-enhancement; CO = conservation versus openness-to-change.

moral variables—moral trait, moral attitudes, and moral behavior. The test was conducted on the MM data set. I tested the four high-order latent constructs—individualizing, binding, self-enhancement/self-transcendence, and openness-to-change/conservation, to determine whether the factors explained unique variance in the morality dependent measures. I focused on the contrasts between individualizing and self-enhancement/self-transcendence and binding versus openness-to-change/conservation.

The results are provided in Table 5. The detailed correlations of the associations between all foundations, values, and morality dependent measures are provided in the Supplementary material. Across the three dependent variables, self-enhancement/self-transcendence values explained unique variance beyond the individualizing foundations and vice versa, and openness-to-

change/conservation explained unique variance beyond the binding foundations and vice versa.

Discussion

A summary of the findings is provided in Table 4. I theorized and found consistent and theoretically meaningful relations between the values circumplex and moral foundations. The findings supported the expected model (summarized in Figure 2 and Table 1) and were consistent across samples. The values tension between self-transcendence and self-enhancement (summarized using SET-shape consistencies) was related to the individualizing foundations, meaning that higher self-transcendence values and lower self-enhancement values were associated with higher concern for harm–care and fairness–reciprocity. The values tension between conservation and openness-to-change (summarized using CO-shape consistencies) was related to the binding foundations, meaning that higher conservation values and lower openness-to-change values were associated with higher concern for in-group–loyalty, authority–respect, and purity–sanctity. The shape consistencies' effect sizes that serve as fit measures for the suggested framework indicate a very strong fit (shape consistency of .83–.90).

The strongest most consistent correlations were between conservation values (tradition, conformity, and security) and the binding foundations (in-group–loyalty, authority–respect, and purity–sanctity). This is to be expected, as conservation ideals aim to align values and morality between people in society. Conservative societies tend to be higher in agreement

Table 4. Summary of Samples and Main Findings on Values–Foundations Links.

Sample	N	Personal Values	Moral Foundations	SET Dominant Foundations Dimensions	CO Dominant Foundations Dimensions
Meta-analytic effects	32,492			Harm/care: .83 Fairness/reciprocity: .84	In-group/loyalty: .89 Authority/respect: .90 Purity/sanctity: .87
Samples					
myPersonality	3,342	SVS-57	MFQ-32	Harm/care: .55 Fairness/reciprocity: .63	In-group/loyalty: .94 Authority/respect: .93 Purity/sanctity: .84
myType	3,184	PVQ-40	MFQ-32	Harm/care: .73 Fairness/reciprocity: .68	In-group/loyalty: .82 Authority/respect: .78 Purity/sanctity: .85
Survey of World Views	7,097	SSVS	MFQ-22	Harm/care: .86 Fairness/reciprocity: .76	In-group/loyalty: .79 Authority/respect: .84 Purity/sanctity: .80
Measuring Morality	1,519	PVQ-21	MSS-S	Harm/care: .78 Fairness/reciprocity: .75	In-group/loyalty: .54 Authority/respect: .59 Purity/sanctity: .68
Yourmorals	17,350	SVS-57	MFQ-32	Harm/care: .82 Fairness/reciprocity: .69	In-group/loyalty: .94 Authority/respect: .95 Purity/sanctity: .95

Note. Consistency effect size guide: 0.4—low; 0.6—moderate; 0.8—strong. SET = SET-shape consistency (self-transcendence vs. self-enhancement). CO = CO-shape consistency (conservation vs. openness-to-change); SSVS = short SVS; MSS-S = short 18-item version of the MSS; MFQ-32 = Moral Foundations Questionnaire; SVS = Schwartz Value Survey; PVQ = Portrait Values Questionnaire.

Table 5. Personal Values and Moral Foundations Incremental Prediction.

High-order dimensions	Dictator Game—Moral Behavior		Heinz and Drug—Moral Attitudes		Moral Identity—Morality Trait	
	ΔR^2	<i>p</i>	ΔR^2	<i>p</i>	ΔR^2	<i>p</i>
1a						
First: SET	.033	<.001	.017	<.001	.044	<.001
Second: Individualizing	.005	=.003	.031	<.001	.014	<.001
1b						
First: Individualizing	.017	<.001	.043	<.001	.032	<.001
Second: SET	.022	<.001	.004	=.010	.026	<.001
2a						
First: CO	.001	=.314	.047	<.001	.016	<.001
Second: Binding	.015	<.001	.045	<.001	.010	<.001
2b						
First: Binding	.016	<.001	.071	<.001	.018	<.001
Second: CO	.000	=.613	.020	<.001	.008	<.001
3a						
First: Binding and individualizing	.019	<.001	.073	<.001	.033	<.001
Second: CO and SET	.024	<.001	.022	<.001	.030	<.001
3b						
First: CO and SET	.033	<.001	.053	<.001	.050	<.001
Second: Binding and individualizing	.010	<.001	.042	<.001	.012	<.001

Note. Values in boldface indicate that dimensions are the stronger predictor alone. First = first step in regression analyses; second = second step in regression analyses; SET = self-enhancement/self-transcendence; CO = openness-to-change/conservation; binding = binding moral foundations; individualizing = individualizing moral foundations.

regarding both their values and morality, with higher monitoring and sanctioning of culturally deviant behaviors, resulting in stronger conservative values–foundations links. Conformity values, for example, have been shown to decrease the impact of other values over emotions and behaviors (Lönnqvist, Walkowitz, Wichardt, Lindeman, & Verkasalo, 2009), which may therefore lead to higher consistency in observing the prevalent cultural values and moral standards. In addition, incremental predictive validity analysis of the four high-order dimensions showed that values and foundations dimensions explained unique variance in the prediction of moral attitudes, behavior, and individual differences.

Theoretical and Empirical Implications and Future Directions

Integration and extending to behavior and real-life situations. Values and foundations have so far been mostly studied in isolation, yet the findings suggest that the literature would greatly benefit from using the theories together in studies aiming to predict human social psyche and behavior, such as in morality variables. The consistent links between the two theories and their usefulness in predicting unique variance in outcomes may lead to a more comprehensive and better integrated understanding of psychosocial phenomenon.

The empirical investigation conducted is a first attempt to theorize and test the unified values–foundations perspective using large-scale data sets in which participants report their values and morality using various measures. The next step would be to extend these findings and test the framework in actual behaviors, both in controlled lab settings and in the field

(Baumeister, Vohs, & Funder, 2007; Graham, 2015). For example, the myPersonality data set offers opportunities for investigating people's personal values and the moral domain looking at their real-life interactions on Facebook, and similar investigations can be done with other social media like Twitter (e.g., Dehghani et al., 2016). I call scholars to extend this initial investigation by looking at how values predict real-life moral judgment and behavior, how morality predicts manifestations of values in real behavior, and how personal values and moral foundations jointly predict people's everyday life behaviors.

Values and foundations theories. The values and foundations theories used are currently the most widely used and cross-culturally validated theories in their domains, yet there are other theories with ongoing debates. The moral foundations theory, for example, is still debated in the moral psychology literature, especially regarding purity and the centrality of harm in moral judgments (Graham, 2015; Gray & Keeney, 2015; Schein & Gray, 2015). There are also recent developments in the values literature, such as the refined theory of values (Schwartz et al., 2012), and suggested improvements in the moral foundations theory to include more than five dimensions, such as liberty–oppression (Haidt, 2012; Iyer et al., 2012). The framework I tested here can be adjusted and elaborated to meet these advancements, and future research can build on these to extend, fine-tune, and further test these ideas.

Values and foundations: Meaning, structure, and causality. The examination of the links between values and morality presents a challenge. The two differ not only in content but also in structure and meaning. Values theory emphasizes a universal

circular structure of values with an inherent tension between values on opposite sides on the values circumplex, whereas foundations theory describes orthogonal dimensions that may or may not conflict (e.g., liberals tend to report stronger tension between the individualizing and the binding foundations, compared to conservatives). These differences also have empirical implications, as values are commonly mean-centered to make clear the values tension, whereas foundations are not. There are further differences in meaning reflected in construal level, as values are abstract and mainly measured by rating importance, whereas foundations are more concrete and mainly measured by making evaluations. This investigation offered a first simplified integration of the two different theories, inviting future research to go deeper and explore these differences and how they may affect associations.

Do values precede foundations or do foundations precede values? Perhaps they are both formed at the same time? The question of which precedes the other remains open. In this investigation, I generally referred to the relationship between the two as the “values–foundations link,” setting aside the question of causality. Yet the question is interesting and important and the findings only represent a snapshot of the relationships at a very specific point in time for when the data were collected and in a specific culture or context.

Political ideology with values–foundations links. Both values and foundations have often been studied in the context of political ideologies, examining associations with right-wing authoritarianism and social dominance orientation (Whitley, 1999). Broadly, those higher in liberal values tend to endorse values of self-transcendence and openness-to-change, whereas those more conservative tend to endorse values of conservation and self-enhancement (Caprara et al., 2006; Jost et al., 2016; Piurko et al., 2011; Schwartz et al., 2010). The literature on foundations showed that in the United States, conservatives differ from liberals in their endorsement of moral foundations, with liberals emphasizing individualizing over binding foundations, whereas conservatives base moral judgment on all foundations (Graham et al., 2009; Haidt et al., 2009; Kugler et al., 2014). Put together, the findings in the two literatures about the links to political ideology are in support of the theoretical model I outlined and the empirical findings. Future research can extend to further theorize and examine links between values, foundations, and political ideology in a single study (e.g., Sylwester & Purver, 2015).

Conclusion

I found support for personal values and moral foundations as explaining unique variance in predicting moral variables with consistent theoretically meaningful relations. I found links between the individualizing foundations and values tension of self-enhancement versus self-transience and between the binding foundations and the values tensions of openness-to-change versus conservation. I discussed implications and laid out promising future directions for research on the two theories.

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Supplemental Material

The supplemental material is available in the online version of the article.

Note

1. Hedonism values fall somewhere between self-enhancement and openness-to-change.

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Personal values and moral foundations

supplementary materials

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Disclosures

Data collection and sampling

Sample size: We used the received data archives of various data collections as is. We analyzed all the received data without exclusions.

Measures: The data archives included many other variables not related to our research question. We provide data and report all data available to us on values and foundations measures.

Open material

This supplementary reports all scales and procedures in detail. The supplementary was made available together with data and code on the Open Science Framework (OSF):

https://osf.io/6qs5g/?view_only=20b24b5b37d1479fb724734b83d0a516

Open data and script statements

The subset of the data archives regarding values and foundations was made available on the OSF project, available for reviewers and to be made publicly available upon official acceptance. In case where data archive access require registration, we will provide a link to the data archive, and share only the code.

Effects

We report meta-analytic effects and 95% confidence (credible) intervals. We provide significance testing p-values indicators where appropriate in correlations tables for the independent studies in the supplementary, although the focus of the investigation is the overall meta effect and consistency shapes provided in the main manuscript.

Scales used in the datasets

Personal values measures

Schwartz Value Survey (SVS; Schwartz, 1992, 1994)

In this questionnaire you are to ask yourself: "What values are important to ME as guiding principles in MY life, and what values are less important to me?" There are two lists of values on the following pages. These values come from different cultures. In the parentheses following each value is an explanation that may help you to understand its meaning.

Your task is to rate how important each value is for you as a guiding principle in your life. Use the rating scale below:

- 0 means the value is not at all important, it is not relevant as a guiding principle for you.
- 3 means the value is important.
- 6 means the value is very important.

The higher the number (0, 1, 2, 3, 4, 5, 6), the more important the value is as a guiding principle in YOUR life.

- -1 is for rating any values opposed to the principles that guide you.
- 7 is for rating a value of supreme importance as a guiding principle in your life; ordinarily there are no more than two such values.

Try to distinguish as much as possible between the values by using all the numbers. You will, of course, need to use numbers more than once. Before you begin, read the values, choose the one that is most important to you and rate its importance. Next, choose the value that is most opposed to your values and rate it -1. If there is no such value, choose the value least important to you and rate it 0 or 1, according to its importance. Then rate the rest of the values in List I.

Values list:

1. EQUALITY (equal opportunity for all)
2. INNER HARMONY (at peace with myself)
3. SOCIAL POWER (control over others, dominance)
4. PLEASURE (gratification of desires)
5. FREEDOM (freedom of action and thought)
6. A SPIRITUAL LIFE (emphasis on spiritual not material matters)
7. SENSE OF BELONGING (feeling that others care about me)
8. SOCIAL ORDER (stability of society)
9. AN EXCITING LIFE (stimulating experiences)
10. MEANING IN LIFE (a purpose in life)
11. POLITENESS (courtesy, good manners)
12. WEALTH (material possessions, money)
13. NATIONAL SECURITY (protection of my nation from enemies)
14. SELF RESPECT (belief in one's own worth)
15. RECIPROCATION OF FAVORS (avoidance of indebtedness)
16. CREATIVITY (uniqueness, imagination)
17. A WORLD AT PEACE (free of war and conflict)
18. RESPECT FOR TRADITION (preservation of time honored customs)

19. MATURE LOVE (deep emotional & spiritual intimacy)
20. SELF DISCIPLINE (self restraint, resistance to temptation)
21. PRIVACY (the right to have a private sphere)
22. FAMILY SECURITY (safety for loved ones)
23. SOCIAL RECOGNITION (respect, approval by others)
24. UNITY WITH NATURE (fitting into nature)
25. A VARIED LIFE (filled with challenge, novelty and change)
26. WISDOM (a mature understanding of life)
27. AUTHORITY (the right to lead or command)
28. TRUE FRIENDSHIP (close, supportive friends)
29. A WORLD OF BEAUTY (beauty of nature and the arts)
30. SOCIAL JUSTICE (correcting injustice, care for the weak)
31. INDEPENDENT (self reliant, self sufficient)
32. MODERATE (avoiding extremes of feeling & action)
33. LOYAL (faithful to my friends, group)
34. AMBITIOUS (hard working, aspiring)
35. BROADMINDED (tolerant of different ideas and beliefs)
36. HUMBLE (modest, self effacing)
37. DARING (seeking adventure, risk)
38. PROTECTING THE ENVIRONMENT (preserving nature)
39. INFLUENTIAL (having an impact on people and events)
40. HONORING OF PARENTS AND ELDERS (showing respect)
41. CHOOSING OWN GOALS (selecting own purposes)
42. HEALTHY (not being sick physically or mentally)
43. CAPABLE (competent, effective, efficient)
44. ACCEPTING MY PORTION IN LIFE (submitting to life's circumstances)
45. HONEST (genuine, sincere)
46. PRESERVING MY PUBLIC IMAGE (protecting my “face”)
47. OBEDIENT (dutiful, meeting obligations)
48. INTELLIGENT (logical, thinking)
49. HELPFUL (working for the welfare of others)
50. ENJOYING LIFE (enjoying food, sex, leisure, etc.)
51. DEVOUT (holding to religious faith & belief)
52. RESPONSIBLE (dependable, reliable)
53. CURIOUS (interested in everything, exploring)
54. FORGIVING (willing to pardon others)
55. SUCCESSFUL (achieving goals)
56. CLEAN (neat, tidy)
57. SELF-INDULGENT (doing pleasant things)
58. (Some versions also have – 58 - OBSERVING SOCIAL NORMS (to maintain face))

Coding

- Power = 3, 12, 27
- Achievement = 34, 43, 55, 39
- Hedonism = 4, 50, 57
- Stimulation = 9, 25, 37

- Self direction = 5, 16, 31, 41, 53
- Universalism = 1, 17, 24, 26, 29, 30, 35, 38
- Benevolence = 33, 45, 49, 52, 54
- Tradition = 36, 44, 51, 32
- Conformity = 11, 20, 40, 47
- Security = 13, 15, 56, 8, 22

Portrait Values Questionnaire (PVQ-40) (Schwartz et al., 2001)

Here we briefly describe some people. Please read each description and think about how much each person is or is not like you. Please indicate how much the person in the description is like you.

- 6 - Very much like me
- 5 - like me
- 4 - some- what like me
- 3 - a little like me
- 2 - not like me
- 1 - not like me at all

Male version

1. Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.
2. It is important to him to be rich. He wants to have a lot of money and expensive things.
3. He thinks it is important that every person in the world be treated equally. He believes everyone should have equal opportunities in life.
4. It's very important to him to show his abilities. He wants people to admire what he does.
5. It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.
6. He thinks it is important to do lots of different things in life. He always looks for new things to try.
7. He believes that people should do what they're told. He thinks people should follow rules at all times, even when no-one is watching.
8. It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.
9. He thinks it's important not to ask for more than what you have. He believes that people should be satisfied with what they have.
10. He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.
11. It is important to him to make his own decisions about what he does. He likes to be free to plan and to choose his activities for himself.
12. It's very important to him to help the people around him. He wants to care for their well-being.
13. Being very successful is important to him. He likes to impress other people.
14. It is very important to him that his country be safe. He thinks the state must be on watch against threats from within and without.
15. He likes to take risks. He is always looking for adventures.

16. It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.
17. It is important to him to be in charge and tell others what to do. He wants people to do what he says.
18. It is important to him to be loyal to his friends. He wants to devote himself to people close to him.
19. He strongly believes that people should care for nature. Looking after the environment is important to him.
20. Religious belief is important to him. He tries hard to do what his religion requires.
21. It is important to him that things be organized and clean. He really does not like things to be a mess.
22. He thinks it's important to be interested in things. He likes to be curious and to try to understand all sorts of things.
23. He believes all the worlds' people should live in harmony. Promoting peace among all groups in the world is important to him.
24. He thinks it is important to be ambitious. He wants to show how capable he is.
25. He thinks it is best to do things in traditional ways. It is important to him to keep up the customs he has learned.
26. Enjoying life's pleasures is important to him. He likes to 'spoil' himself.
27. It is important to him to respond to the needs of others. He tries to support those he knows.
28. He believes he should always show respect to his parents and to older people. It is important to him to be obedient.
29. He wants everyone to be treated justly, even people he doesn't know. It is important to him to protect the weak in society.
30. He likes surprises. It is important to him to have an exciting life.
31. He tries hard to avoid getting sick. Staying healthy is very important to him.
32. Getting ahead in life is important to him. He strives to do better than others.
33. Forgiving people who have hurt him is important to him. He tries to see what is good in them and not to hold a grudge.
34. It is important to him to be independent. He likes to rely on himself.
35. Having a stable government is important to him. He is concerned that the social order be protected.
36. It is important to him to be polite to other people all the time. He tries never to disturb or irritate others.
37. He really wants to enjoy life. Having a good time is very important to him.
38. It is important to him to be humble and modest. He tries not to draw attention to himself.
39. He always wants to be the one who makes the decisions. He likes to be the leader.
40. It is important to him to adapt to nature and to fit into it. He believes that people should not change nature.

Female version

1. Thinking up new ideas and being creative is important to her. She likes to do things in her own original way.
2. It is important to her to be rich. She wants to have a lot of money and expensive things.

3. She thinks it is important that every person in the world be treated equally. She believes everyone should have equal opportunities in life.
4. It's very important to her to show her abilities. She wants people to admire what she does.
5. It is important to her to live in secure surroundings. She avoids anything that might endanger her safety.
6. She thinks it is important to do lots of different things in life. She always looks for new things to try.
7. She believes that people should do what they're told. She thinks people should follow rules at all times, even when no-one is watching.
8. It is important to her to listen to people who are different from her. Even when she disagrees with them, she still wants to understand them.
9. She thinks it's important not to ask for more than what you have. She believes that people should be satisfied with what they have.
10. She seeks every chance she can to have fun. It is important to her to do things that give her pleasure.
11. It is important to her to make her own decisions about what she does. She likes to be free to plan and to choose her activities for herself.
12. It's very important to her to help the people around her. She wants to care for their well-being.
13. Being very successful is important to her. She likes to impress other people.
14. It is very important to her that her country be safe. She thinks the state must be on watch against threats from within and without.
15. She likes to take risks. She is always looking for adventures.
16. It is important to her always to behave properly. She wants to avoid doing anything people would say is wrong.
17. It is important to her to be in charge and tell others what to do. She wants people to do what she says.
18. It is important to her to be loyal to her friends. She wants to devote herself to people close to her.
19. She strongly believes that people should care for nature. Looking after the environment is important to her.
20. Religious belief is important to her. She tries hard to do what her religion requires.
21. It is important to her that things be organized and clean. She really does not like things to be a mess.
22. She thinks it's important to be interested in things. She likes to be curious and to try to understand all sorts of things.
23. She believes all the world's people should live in harmony. Promoting peace among all groups in the world is important to her.
24. She thinks it is important to be ambitious. She wants to show how capable she is.
25. She thinks it is best to do things in traditional ways. It is important to her to keep up the customs she has learned.
26. Enjoying life's pleasures is important to her. She likes to 'spoil' herself.
27. It is important to her to respond to the needs of others. She tries to support those she knows.
28. She believes she should always show respect to her parents and to older people. It is important to her to be obedient.

29. She wants everyone to be treated justly, even people she doesn't know. It is important to her to protect the weak in society.
30. She likes surprises. It is important to her to have an exciting life.
31. She tries hard to avoid getting sick. Staying healthy is very important to her.
32. Getting ahead in life is important to her. She strives to do better than others.
33. Forgiving people who have hurt her is important to her. She tries to see what is good in them and not to hold a grudge.
34. It is important to her to be independent. She likes to rely on herself.
35. Having a stable government is important to her. She is concerned that the social order be protected.
36. It is important to her to be polite to other people all the time. She tries never to disturb or irritate others.
37. She really wants to enjoy life. Having a good time is very important to her.
38. It is important to her to be humble and modest. She tries not to draw attention to herself.
39. She always wants to be the one who makes the decisions. She likes to be the leader.
40. It is important to her to adapt to nature and to fit into it. She believes that people should not change nature.

Coding

- Conformity - 7,16,28,36
- Tradition - 9,20,25,38
- Benevolence - 12,18,27,33
- Universalism - 3,8,19,23,29,40
- Self-Direction - 1,11,22,34
- Stimulation - 6,15,30
- Hedonism - 10,26,37
- Achievement - 4,13,24,32
- Power - 2,17,39
- Security - 5,14,21,31,35

Short SVS (SSVS; Lindeman & Verkasalo, 2005)

Rate the importance of the following values as a life-guiding principle for you

In which:

- 0= opposed to my principles
- 1= not important
- 4= important
- 8= of supreme importance

List of values:

1. POWER (social power, authority, wealth)
2. ACHIEVEMENT (success, capability, ambition, influence on people and events)
3. HEDONISM (gratification of desires, enjoyment in life, self-indulgence)
4. STIMULATION (daring, a varied and challenging life, an exciting life)
5. SELF-DIRECTION (creativity, freedom, curiosity, independence, choosing one's own goals)

6. UNIVERSALISM (broad-mindedness, beauty of nature and arts, social justice, a world at peace, equality, wisdom, unity with nature, environmental protection)
7. BENEVOLENCE (helpfulness, honesty, forgiveness, loyalty, responsibility)
8. TRADITION (respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)
9. CONFORMITY (obedience, honoring parents and elders, self-discipline, politeness)
10. SECURITY (national security, family security, social order, cleanliness, reciprocation of favors)

Portrait Values Questionnaire PVQ-21 (ESS)

Here we briefly describe some people. Please read each description and think about how much each person is or is not like you then proceed to indicate how much the person in the description is like you.

- 6 - Very much like me
- 5 - like me
- 4 - some- what like me
- 3 - a little like me
- 2 - not like me
- 1 - not like me at all

Male version

1. Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.
2. It is important to him to be rich. He wants to have a lot of money and expensive things.
3. He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life.
4. It's important to him to show his abilities. He wants people to admire what he does.
5. It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.
6. He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life.
7. He believes that people should do what they're told. He thinks people should follow rules at all times, even when no-one is watching.
8. It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.
9. It is important to him to be humble and modest. He tries not to draw attention to himself.
10. Having a good time is important to him. He likes to "spoil" himself.
11. It is important to him to make his own decisions about what he does. He likes to be free and not depend on others.
12. It's very important to him to help the people around him. He wants to care for their well-being.
13. Being very successful is important to him. He hopes people will recognise his achievements.
14. It is important to him that the government ensures his safety against all threats. He wants the state to be strong so it can defend its citizens.
15. He looks for adventures and likes to take risks. He wants to have an exciting life.

16. It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.
17. It is important to him to get respect from others. He wants people to do what he says.
18. It is important to him to be loyal to his friends. He wants to devote himself to people close to him.
19. He strongly believes that people should care for nature. Looking after the environment is important to him.
20. Tradition is important to him. He tries to follow the customs handed down by his religion or his family.
21. He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.

Female version

1. Thinking up new ideas and being creative is important to her. She likes to do things in her own original way.
2. It is important to her to be rich. She wants to have a lot of money and expensive things.
3. She thinks it is important that every person in the world should be treated equally. She believes everyone should have equal opportunities in life.
4. It's important to her to show her abilities. She wants people to admire what she does.
5. It is important to her to live in secure surroundings. She avoids anything that might endanger her safety.
6. She likes surprises and is always looking for new things to do. She thinks it is important to do lots of different things in life.
7. She believes that people should do what they're told. She thinks people should follow rules at all times, even when no-one is watching.
8. It is important to her to listen to people who are different from her. Even when she disagrees with them, she still wants to understand them.
9. It is important to her to be humble and modest. She tries not to draw attention to herself.
10. Having a good time is important to her. She likes to "spoil" herself.
11. It is important to her to make her own decisions about what she does. She likes to be free and not depend on others.
12. It's very important to her to help the people around her. She wants to care for their well-being.
13. Being very successful is important to her. She hopes people will recognise her achievements.
14. It is important to her that the government ensures her safety against all threats. She wants the state to be strong so it can defend its citizens.
15. She looks for adventures and likes to take risks. She wants to have an exciting life.
16. It is important to her always to behave properly. She wants to avoid doing anything people would say is wrong.
17. It is important to her to get respect from others. She wants people to do what she says.
18. It is important to her to be loyal to her friends. She wants to devote herself to people close to her.
19. She strongly believes that people should care for nature. Looking after the environment is important to her.

20. Tradition is important to her. She tries to follow the customs handed down by her religion or her family.
21. She seeks every chance she can to have fun. It is important to her to do things that give her pleasure.

Coding

- Conformity 7,16
- Tradition 9,20
- Benevolence 12,18
- Universalism 3,8,19
- Self-Direction 1,11
- Stimulation 6,15
- Hedonism 10,21
- Achievement 4,13
- Power 2,17
- Security 5,14

Moral foundations measures

Moral Foundations Questionnaire (MFQ; Graham et al., 2009)

Part 1. When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking? Please rate each statement using this scale:

0. not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
1. not very relevant
2. slightly relevant
3. somewhat relevant
4. very relevant
5. extremely relevant (This is one of the most important factors when I judge right and wrong)

Items:

1. Whether or not someone suffered emotionally
2. Whether or not some people were treated differently than others
3. Whether or not someone's action showed love for his or her country
4. Whether or not someone showed a lack of respect for authority
5. Whether or not someone violated standards of purity and decency
6. Whether or not someone was good at math
7. Whether or not someone cared for someone weak or vulnerable
8. Whether or not someone acted unfairly
9. Whether or not someone did something to betray his or her group
10. Whether or not someone conformed to the traditions of society
11. Whether or not someone did something disgusting
12. Whether or not someone was cruel
13. Whether or not someone was denied his or her rights
14. Whether or not someone showed a lack of loyalty

15. Whether or not an action caused chaos or disorder

16. Whether or not someone acted in a way that God would approve of

Part 2. Please read the following sentences and indicate your agreement or disagreement:

0. Strongly disagree
1. Moderately disagree
2. Slightly disagree
3. Slightly agree
4. Moderately agree
5. Strongly agree

Items:

17. Compassion for those who are suffering is the most crucial virtue.
18. When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
19. I am proud of my country's history.
20. Respect for authority is something all children need to learn.
21. People should not do things that are disgusting, even if no one is harmed.
22. It is better to do good than to do bad.
23. One of the worst things a person could do is hurt a defenceless animal.
24. Justice is the most important requirement for a society.
25. People should be loyal to their family members, even when they have done something wrong.
26. Men and women each have different roles to play in society.
27. I would call some acts wrong on the grounds that they are unnatural.
28. It can never be right to kill a human being.
29. I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
30. It is more important to be a team player than to express oneself.
31. If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
32. Chastity is an important and valuable virtue.

Coding

- Harm/care: 01, 07, 12, 17, 23, 28
- Fairness/reciprocity: 02, 08, 13, 18, 24, 29
- Ingroup/loyalty: 03, 09, 14, 19, 25, 30
- Authority/respect: 04, 10, 15, 20, 26, 31
- Purity/sanctity: 05, 11, 16, 21, 27, 32

MFQ-22 (Graham, Haidt, & Nosek, 2008)

Part 1. When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking? Please rate each statement using this scale:

0. not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
1. not very relevant

2. slightly relevant
3. somewhat relevant
4. very relevant
5. extremely relevant (This is one of the most important factors when I judge right and wrong)

Items:

1. Whether or not someone suffered emotionally
2. Whether or not some people were treated differently than others
3. Whether or not someone's action showed love for his or her country
4. Whether or not someone showed a lack of respect for authority
5. Whether or not someone violated standards of purity and decency
6. Whether or not someone was good at math
7. Whether or not someone cared for someone weak or vulnerable
8. Whether or not someone acted unfairly
9. Whether or not someone did something to betray his or her group
10. Whether or not someone conformed to the traditions of society
11. Whether or not someone did something disgusting

Part 2. Please read the following sentences and indicate your agreement or disagreement:

0. Strongly disagree
1. Moderately disagree
2. Slightly disagree
3. Slightly agree
4. Moderately agree
5. Strongly agree

Items:

12. Compassion for those who are suffering is the most crucial virtue.
13. When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
14. I am proud of my country's history.
15. Respect for authority is something all children need to learn.
16. People should not do things that are disgusting, even if no one is harmed.
17. It is better to do good than to do bad.
18. One of the worst things a person could do is hurt a defenseless animal.
19. Justice is the most important requirement for a society.
20. People should be loyal to their family members, even when they have done something wrong.
21. Men and women each have different roles to play in society.
22. I would call some acts wrong on the grounds that they are unnatural.

(Graham, J., Haidt, J., & Nosek, B. A. (2008). The moral foundations questionnaire. Retrieved from June 2017 from <http://moralfoundations.org/questionnaires>)

Coding

- Harm: 1, 7, 12, 18

- Fairness: 2, 8, 13, 19
- Ingroup: 3, 9, 14, 20
- Authority: 4, 10, 15, 21
- Purity : 5, 11, 16, 22

Moral Foundations Sacredness Scale (MSS; Graham & Haidt, 2012)

Try to imagine actually doing the following things, and indicate how much money someone would have to pay you, (anonymously and secretly) to be willing to do each thing. For each action, assume that nothing bad would happen to you afterwards. Also assume that you cannot use the money to make up for your action.

Values

1. \$0 (I'd do it for free);
2. \$10;
3. \$100;
4. \$1000;
5. \$10,000;
6. \$100,000;
7. a million dollars;
8. never for any amount of money

Harm:

1. Kick a dog in the head, hard
2. Shoot and kill an animal that is a member of an endangered species
3. Make cruel remarks to an overweight person about his or her appearance
4. Stick a pin into the palm of a child you don't know

Fairness:

1. Cheat in a game of cards played for money with some people you don't know well
2. Say no to a friend's request to help him move into a new apartment, after he helped you move the month before
3. Throw out a box of ballots, during an election, to help your favored candidate win
4. Sign a secret-but-binding pledge to only hire people of your race in your company

Ingroup:

1. Say something bad about your nation (which you don't believe to be true) while calling in, anonymously, to a talk-radio show in a foreign nation
2. Break off all communications with your immediate and extended family for 1 year
3. Burn your country's flag, in private (nobody else sees you)
4. Leave the social group, club, or team that you most value

Authority:

1. Curse your parents, to their face. (You can apologize and explain one year later)
2. Make a disrespectful hand gesture to your boss, teacher, or professor
3. Throw a rotten tomato at a political leader you dislike. (remember, you will not get caught)
4. Slap your father in the face (with his permission) as part of a comedy skit

Purity:

1. Sign a piece of paper that says “I hereby sell my soul, after my death, to whoever has this piece of paper”
2. Get plastic surgery that adds a 2 inch tail on to the end of your spine (you can remove it in three years)
3. Get a blood transfusion of 1 pint of disease-free, compatible blood from a convicted child molester
4. Attend a performance art piece in which all participants (including you) have to act like animals for 30 minutes, including crawling around naked and urinating on stage

Nonmoral:

1. Sit in a bathtub full of ice water for 10 minutes
2. Wear a sign on your back for one month that says, in large letters, “I am an idiot.”
3. Experience a severe headache for two weeks
4. Lose your sense of hearing for one year

18-item version of the MSS (MSS-S; Graham & Haidt, 2012)

Try to imagine actually doing the following things, and indicate how much money someone would have to pay you, (anonymously and secretly) to be willing to do each thing. For each action, assume that nothing bad would happen to you afterwards. Also assume that you cannot use the money to make up for your action.

1. Cheat in a game of cards played for money with some people you don't know well
2. Throw out a box of ballots, during an election, to help your favored candidate win
3. Sign a secret-but-binding pledge to only hire people of your race in your company
4. Say something bad about your nation (which you don't believe to be true) while calling in, anonymously, to a talk-radio show in a foreign nation
5. Break off all communications with your immediate and extended family for 1 year
6. Burn your country's flag, in private (nobody else sees you)
7. Curse your parents, to their face. (You can apologize and explain one year later)
8. Make a disrespectful hand gesture to your boss, teacher, or professor
9. Throw a rotten tomato at a political leader you dislike. (remember, you will not get caught)
10. Sign a piece of paper that says “I hereby sell my soul, after my death, to whoever has this piece of paper”
11. Get a blood transfusion of one pint of disease-free, compatible blood from a convicted child molester
12. Attend a performance art piece in which all participants (including you) have to act like animals for 30 minutes, including crawling around naked and urinating on stage
13. Sit in a bathtub full of ice water for 10 minutes
14. Wear a sign on your back for one month that says, in large letters, “I am an idiot.”
15. Experience a severe headache for two weeks
16. Kick a dog in the head, hard
17. Make cruel remarks to an overweight person about his or her appearance
18. Stick a pin into the palm of a child you don't know

Scale:

- -1. Refused
- \$0 (I'd do it for free)
- \$10
- \$100
- \$1,000
- \$10,000
- \$100,000
- \$1 million dollars or more
- never for any amount of money

Coding

- Harm: 16, 17, 18
- Fairness: 1, 2, 3
- Ingroup: 4, 5, 6
- Authority: 7, 8, 9
- Purity: 10, 11, 12

Incremental predictive validity measures

Measuring Morality dependent measures information:

Dictator game

Now we are going to give you the chance to win [Version1: \$10; Version2: \$500]

Here's how it works: You have an even numbered participant ID. Participants in even numbered sessions are assigned to be DECIDERS. As a DECIDER, you are automatically given 10 raffle tickets for the prize. Each ticket is equal to one entry into the raffle. The 10 tickets are yours to keep. However, the participant after you (with the odd numbered participant ID) will be a RECEIVER. This means that the next participant will not have any raffle tickets to start with, but will get any tickets that you decide to transfer to him or her. Thus, it is up to you to determine how to divide up the number of raffle tickets you and the next participant will receive.

How many of your 10 raffle tickets would you like to transfer to the next participant?

Scale: 0 to 10

References:

Engel, C. (2011). Dictator games: A meta study. *Experimental Economics*, 14(4), 583-610.

Heinz and the Drug

The purpose of this section is to help us understand how people think about social problems. Different people have different opinions about questions of right and wrong. There are no "right" answers to such problems in the way that math problems have right answers.

Please read the following scenario and then answer the questions that follow.

In Europe a woman was near death from a special kind of cancer. There was one drug that doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost to make. He paid \$200 for the radium and charged \$2,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about \$1,000, which is half of what it cost. He told the druggist that his wife was dying, and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money from it." So Heinz got desperate and began to think about breaking into the man's store to steal the drug for his wife.

Should Heinz steal the drug?

1. Yes, he should steal the drug
2. I can't decide
3. No, he should not steal the drug

Moral identity scale

Here are some characteristics that might describe a person:

Caring, Compassionate, Fair, Friendly, Generous, Helpful, Hardworking, Honest, Kind

The person with these characteristics could be you or it could be someone else. For a moment, visualize in your mind the kind of person who has these characteristics. Imagine how that person would think, feel, and act. When you have a clear image of what this person would be like, answer the following questions.

1. It would make me feel good to be a person who has these characteristics.
2. Being someone who has these characteristics is an important part of who I am.
3. I often wear clothes that identify me as having these characteristics.
4. I would be ashamed to be a person who had these characteristics.
5. The types of things I do in my spare time (e.g., hobbies) clearly identify me as having these characteristics.
6. The kinds of books and magazines that I read identify me as having these characteristics.
7. Having these characteristics is not really important to me.
8. The fact that I have these characteristics is communicated to others by my membership in certain organizations.
9. I am actively involved in activities that communicate to others that I have these characteristics.
10. I strongly desire to have these characteristics.

Scale: 1 - *Completely Disagree* to 7 - *Completely Agree*

Reference: Aquino, K., & Reed II, A. (2002). The self-importance of moral identity. *Journal of personality and social psychology*, 83(6), 1423.

Coding: Reversed items: 4, 7.

Additional readings regarding values and foundation theories.

Scale validation and adequacy

In the manuscript, we analyzed datasets that used a variety of personal values and moral foundations scales. The references below are articles discussing the equivalence across scales and cultures.

Personal values

SVS

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Advances in experimental social psychology*, 25, 1-65.

Schwartz, S. H., & Boehnke, K. (2004). Evaluating the structure of human values with confirmatory factor analysis. *Journal of research in personality*, 38(3), 230-255.

SSVS

Lindeman, M., & Verkasalo, M. (2005). Measuring values with the short Schwartz's value survey. *Journal of personality assessment*, 85(2), 170-178.

Sandy, C. J., Gosling, S. D., Schwartz, S. H., & Koelkebeck, T. (2016). The development and validation of brief and ultrabrief measures of values. *Journal of personality assessment*, 1-11.

PVQ / PVQ-21:

Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., Harris, M., & Owens, V. (2001). Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *Journal of cross-cultural psychology*, 32(5), 519-542.

Schwartz, S. H. (2003). A proposal for measuring value orientations across nations. *Questionnaire Package of the European Social Survey*, 259-290.

Davidov, E., Schmidt, P., & Schwartz, S. H. (2008). Bringing values back in: The adequacy of the European Social Survey to measure values in 20 countries. *Public opinion quarterly*, 72(3), 420-445.

Fischer, R., & Schwartz, S. (2011). Whence differences in value priorities? Individual, cultural, or artifactual sources. *Journal of Cross-Cultural Psychology*, 42(7), 1127-1144.

Vecchione, M., Casconi, T., & Barbaranelli, C. (2009). Assessing the circular structure of the Portrait Values Questionnaire: A confirmatory factor analysis approach. *European Journal of Psychological Assessment*, 25(4), 231-238.

Schwartz, S. H. (2007). Value orientations: Measurement, antecedents and consequences across nations. *Measuring attitudes cross-nationally: Lessons from the European Social Survey*, 161-193.

Bilsky, W., Janik, M., & Schwartz, S. H. (2011). The structural organization of human values-evidence from three rounds of the European Social Survey (ESS). *Journal of Cross-Cultural Psychology*, 42(5), 759-776.

Cross cultural

Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., Harris, M., & Owens, V. (2001). Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. *Journal of cross-cultural psychology*, 32(5), 519-542.

Schwartz, S. H., & Bardi, A. (2001). Value hierarchies across cultures: Taking a similarities perspective. *Journal of cross-cultural Psychology*, 32(3), 268-290.

Spini, D. (2003). Measurement equivalence of 10 value types from the Schwartz value survey across 21 countries. *Journal of cross-cultural psychology*, 34(1), 3-23.

Moral foundations***Moral Foundations Questionnaire (MFQ)***

Graham, J., Haidt, J., & Nosek, B. A. (2009). Liberals and conservatives rely on different sets of moral foundations. *Journal of personality and social psychology*, 96(5), 1029.

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of personality and social psychology*, 101(2), 366.

Moral Foundations Sacredness Scale (MSS; Graham & Haidt, 2012)

Graham, J., & Haidt, J. (2012). Sacred values and evil adversaries: A moral foundations approach. *The social psychology of morality: Exploring the causes of good and evil*, 11-31.

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of personality and social psychology*, 101(2), 366.

Cross cultural

Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of personality and social psychology*, 101(2), 366.

Iurino, K. & Saucier, G. (2014). Measurement Invariance of the Moral Foundations Questionnaire Across 27 Countries. Unpublished/under-review.

Stankov, L., & Lee, J. (2009). Dimensions of cultural differences: Pancultural, ETIC/EMIC, and ecological approaches. *Learning and Individual Differences*, 19(3), 339-354.

Stankov, L., & Lee, J. (2016). Nastiness, Morality and Religiosity in 33 nations. *Personality and Individual Differences*, 99, 56-66. <https://doi.org/10.1016/j.paid.2016.04.069>

Davis, D. E., Dooley, M. T., Hook, J. N., Choe, E., & McElroy, S. E. (2017). The purity/sanctity subscale of the Moral Foundations Questionnaire does not work similarly for religious versus non-religious individuals. *Psychology of Religion and Spirituality*, 9(1), 124.

Davis, D. E., Rice, K., Van Tongeren, D. R., Hook, J. N., DeBlare, C., Worthington Jr, E. L., & Choe, E. (2016). The moral foundations hypothesis does not replicate well in Black samples. *Journal of personality and social psychology*, 110(4), e23.

Moral foundations scales validated cross-culturally in specific countries:

1. New Zealand

- a. Davies, C. L., Sibley, C. G., & Liu, J. H. (2014). Confirmatory factor analysis of the Moral Foundations Questionnaire: Independent scale validation in a New Zealand sample. *Social Psychology*, 45(6), 431.

2. Sweden

- a. Nilsson, A., & Erlandsson, A. (2015). The Moral Foundations taxonomy: Structural validity and relation to political ideology in Sweden. *Personality and Individual Differences*, 76, 28-32.

3. Turkey

- a. Yilmaz, O., Harma, M., Bahçekapili, H. G., & Cesur, S. (2016). Validation of the moral foundations questionnaire in Turkey and its relation to cultural schemas of individualism and collectivism. *Personality and Individual Differences*, 99, 149-154.
- b. Yalçındağ, B., Özkan, T., Cesur, S., Yilmaz, O., Tepe, B., Piyale, Z. E., ... & Sunar, D. (2017). An Investigation of Moral Foundations Theory in Turkey Using Different Measures. *Current Psychology*, 1-18.
- c. Yılmaz, O., Sarıbay, S. A., Bahçekapılı, H. G., & Harma, M. (2016). Political orientations, ideological self-categorizations, party preferences, and moral foundations of young Turkish voters. *Turkish Studies*, 17(4), 544-566.

4. Korea

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Additional analyses

Correlations after country mean centering

Personal values and moral foundations mini meta-analytic effects after country mean centering

	Power		Achievement		Hedonism		Stimulation		Self-direction	
Harm-care	-.23		-.15		-.13		-.08		-.06	
95% CI	-.34	-.12	-.25	-.04	-.17	-.09	-.15	-.02	-.18	.06
Fairness-reciprocity	-.21		-.11		-.11		-.06		-.01	
95% CI	-.28	-.13	-.20	-.03	-.16	-.06	-.11	-.02	-.12	.10
Ingroup-loyalty	-.03		-.06		-.14		-.12		-.20	
95% CI	-.17	.11	-.13	.01	-.19	-.09	-.15	-.08	-.30	-.08
Authority-respect	-.03		-.07		-.17		-.17		-.23	
95% CI	-.18	.12	-.14	.00	-.23	-.10	-.23	-.10	-.35	-.10
Purity-sanctity	-.05		-.07		-.19		-.17		-.22	
95% CI	-.13	.02	-.11	-.03	-.33	-.04	-.25	-.08	-.37	-.05

	Universalism		Benevolence		Tradition		Conformity		Security	
Harm-care	.23		.19		.08		.06		.01	
95% CI	.03	.41	.15	.24	.02	.14	-.03	.16	-.13	.14
Fairness-reciprocity	.23		.15		.03		.05		.02	
95% CI	.03	.41	.11	.19	-.09	.16	-.09	.19	-.11	.15
Ingroup-loyalty	-.13		.07		.21		.22		.18	
95% CI	-.30	.04	-.01	.14	.15	.27	.09	.34	.05	.31
Authority-respect	-.13		.04		.25		.28		.19	
95% CI	-.32	.07	-.02	.11	.13	.36	.09	.46	.00	.35
Purity-sanctity	-.13		.07		.29		.25		.17	
95% CI	-.27	.02	.00	.13	.12	.44	.06	.42	.07	.27

Note: Deviations from correlations with no country centering were up to 0.02, deviations in CIs were up to 0.04. Bolded values represent correlation values that changed due to centering.

Factor analyses

Background

Factor analyses tested were added to address feedback received during peer review.

The purpose of the factor analyses was to examine whether the foundations and values (from now on - categories) load onto the expected latent factors. These analyses were not meant to verify the scales or check whether individual items indeed loaded on the correct categories. Therefore, factors analyses assumed categories are a given and the analysis was conducted on a category level.

In practice, this meant:

1. In the exploratory factor analysis and multi-dimensional scaling the analysis was conducted on the categories, the aggregated variables computed as the average of individual items that comprise each category.
2. In the confirmatory factor analysis using Structure Equation Modeling the analysis was conducted on categories using the individual items. This was done by forcing the individual items to load onto the expected categories. Category level analyses without individual items introduced challenges in terms of much lower model fit.

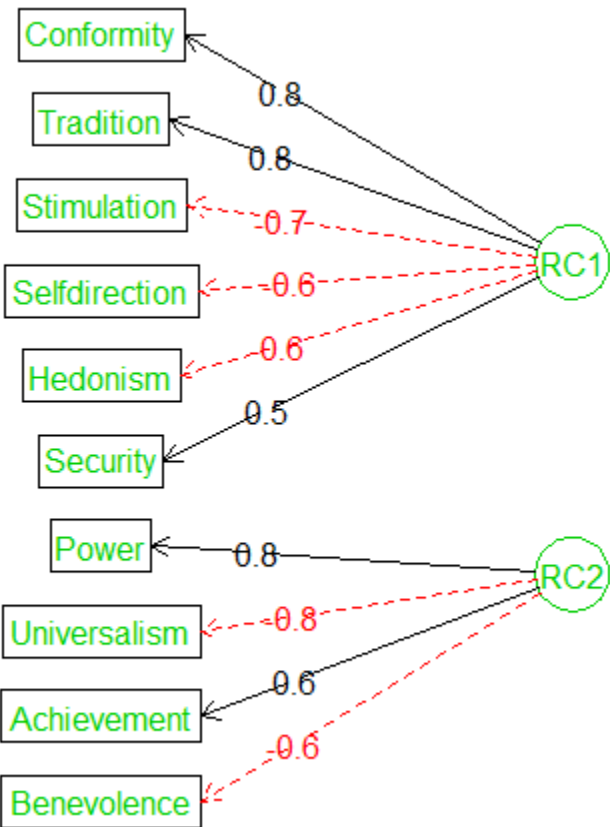
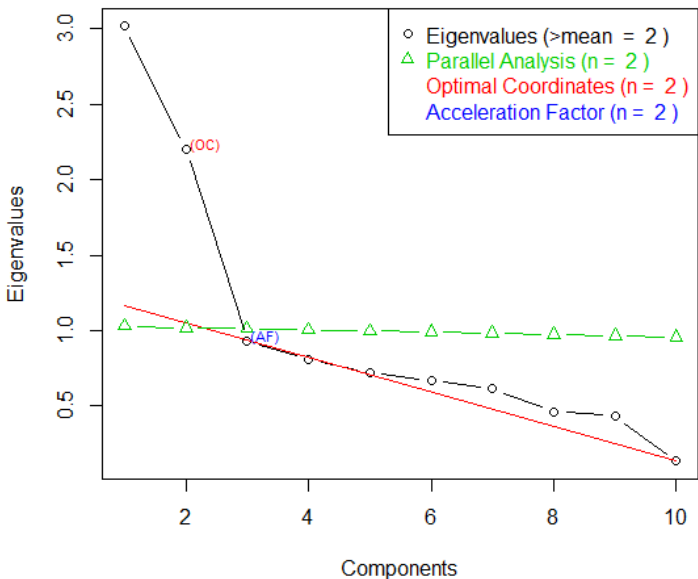
I chose the single largest sample of a single culture with the most validated scales in the values and foundations literatures - yourmorals.org. I hope that this analysis can help guide future research in this direction and test conclusions from this analysis on a dedicated sample meant specifically for the purpose of a factor analysis.

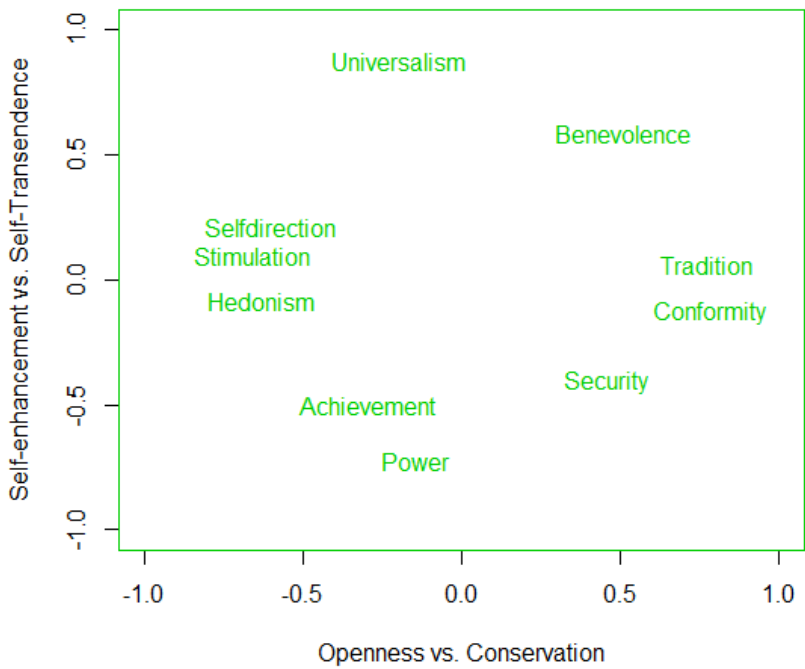
Exploratory factor analysis**(EFA) Correlations table**

Correlations table for yourmorals.org dataset Americans sample:

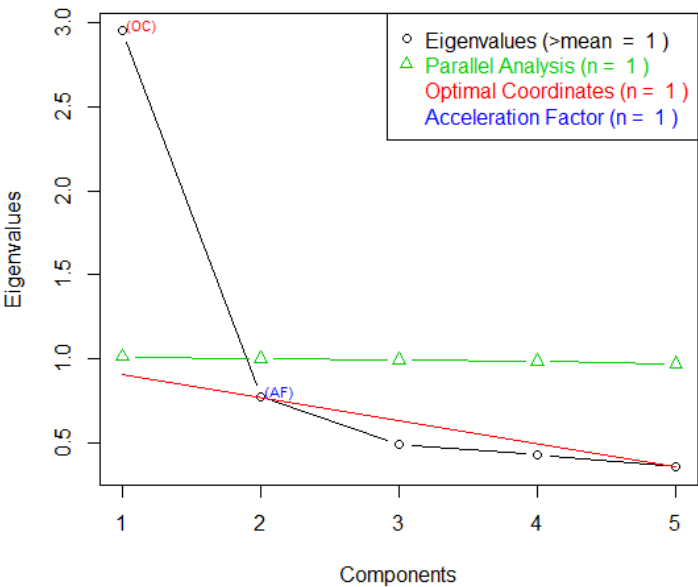
	Fairness	Ingroup	Authority	Purity	Power	Achieve	Hedon
Harm-Care	.63	.46	.47	.37	-.35	-.23	-.30
Fairness-Reciprocity		.51	.49	.35	-.30	-.20	-.35
Ingroup-Loyalty			.57	.50	-.11	-.09	-.30
Authority-Respect				.51	-.11	-.11	-.33
Purity-Sanctity					-.02	-.06	-.29
Power						.40	.18
Achievement							.06
	Stimul	Self-dir	Univers	Benev	Trad	Confom	Secur
Harm-Care	-.19	-.15	.29	.27	.11	.12	-.01
Fairness-Reciprocity	-.18	-.10	.16	.32	.17	.20	.06
Ingroup-Loyalty	-.20	-.24	-.08	.21	.20	.28	.19
Authority-Respect	-.26	-.26	-.06	.18	.28	.35	.17
Purity-Sanctity	-.25	-.26	-.15	.09	.28	.30	.21
Power	.04	-.07	-.51	-.41	-.09	-.01	.19
Achievement	.15	.06	-.36	-.29	-.28	-.13	-.03
Hedonism	.32	.23	-.06	-.36	-.43	-.44	-.14
Stimulation		.29	.02	-.28	-.41	-.40	-.33
Self-direction			.08	-.24	-.44	-.42	-.22
Universalism				.11	-.24	-.34	-.41
Benevolence					.24	.21	-.07
Tradition						.48	.17
Conformity							.37

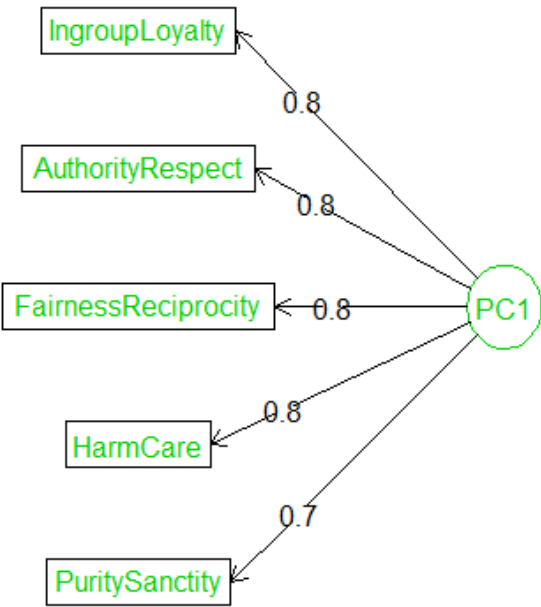
(EFA) Personal values only



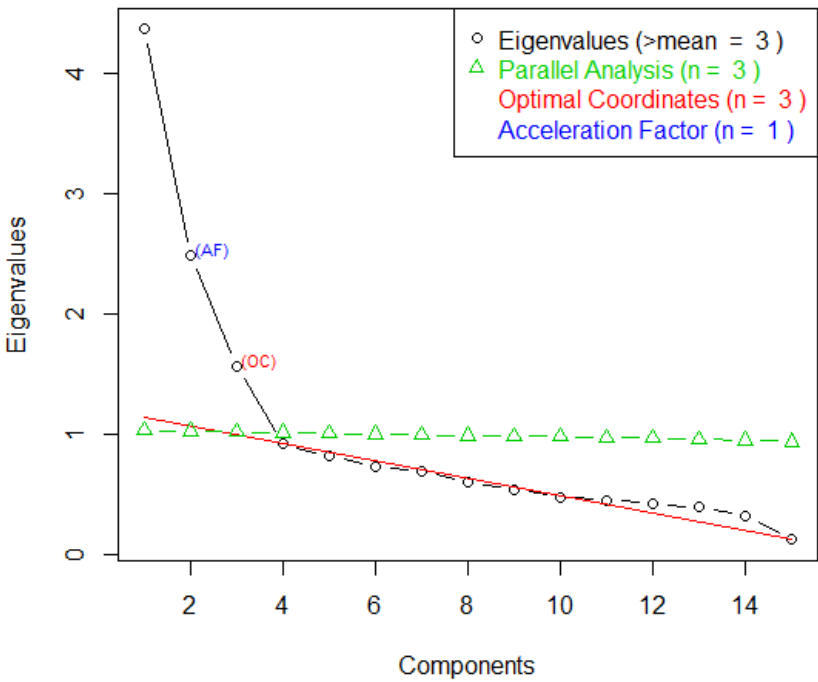


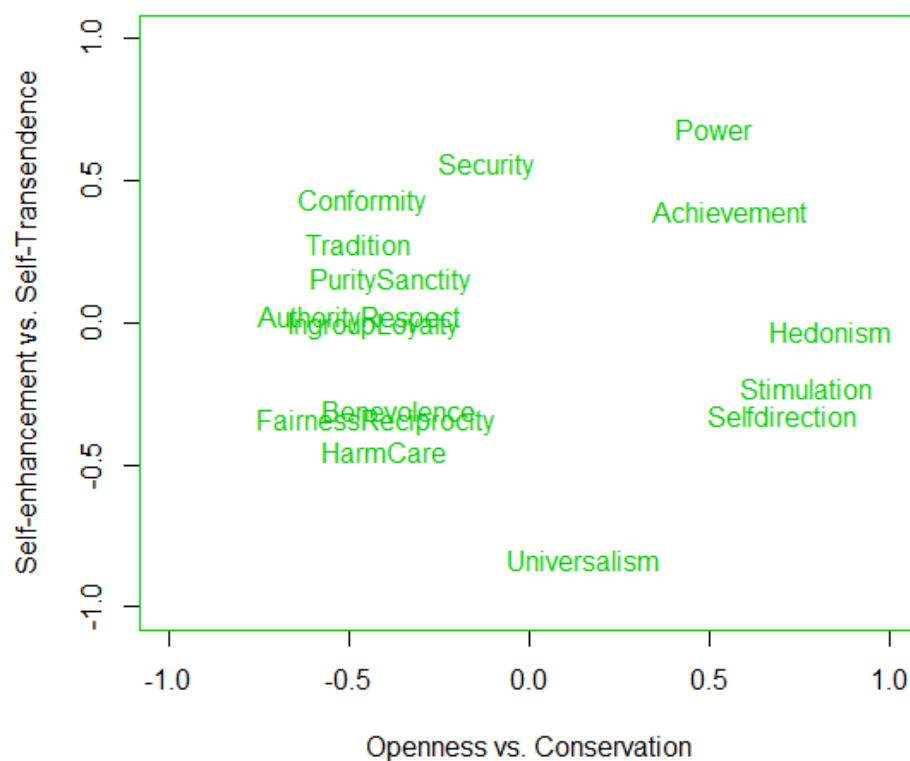
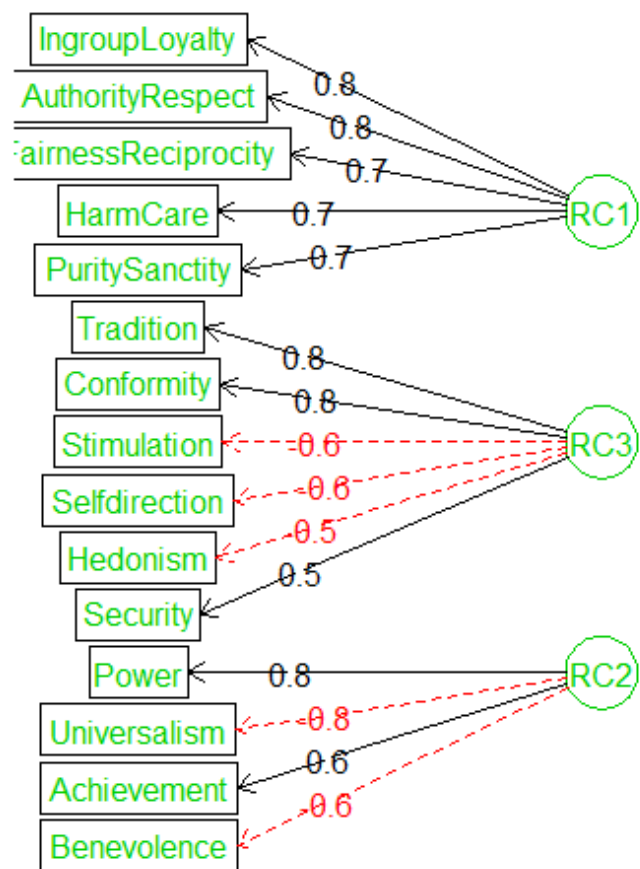
(EFA) Moral foundations only





(EFA) Personal values with moral foundations



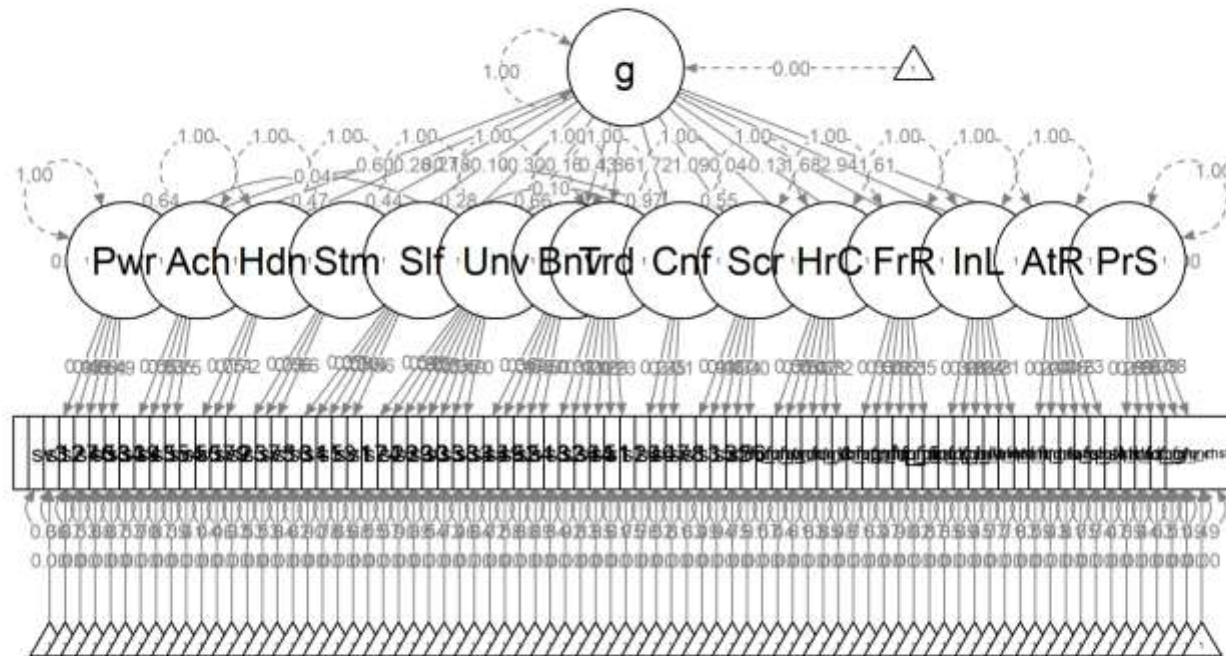


Confirmatory factor analysis***(CFA) Model comparison***

	RMSEA	AIC	BIC	χ^2	DF
Model 1: One factor	0.061	3678830	3680841	193740	2823
Model 2: 2 factor binding and individualizing	0.061	3678191	3679607	183865	2822
Model 3: 2 factor values and moral foundations	0.059	3668803	3670219	193254	2822
Model 4: 3 factors, combining binding with CO	0.059	3668538	3669969	183596	2820
Model 5: 3 factors, combining individualizing with SET	0.059	3667493	3668924	182551	2820
Model 6: 4 factors	0.058	3665053	3666508	180106	2817

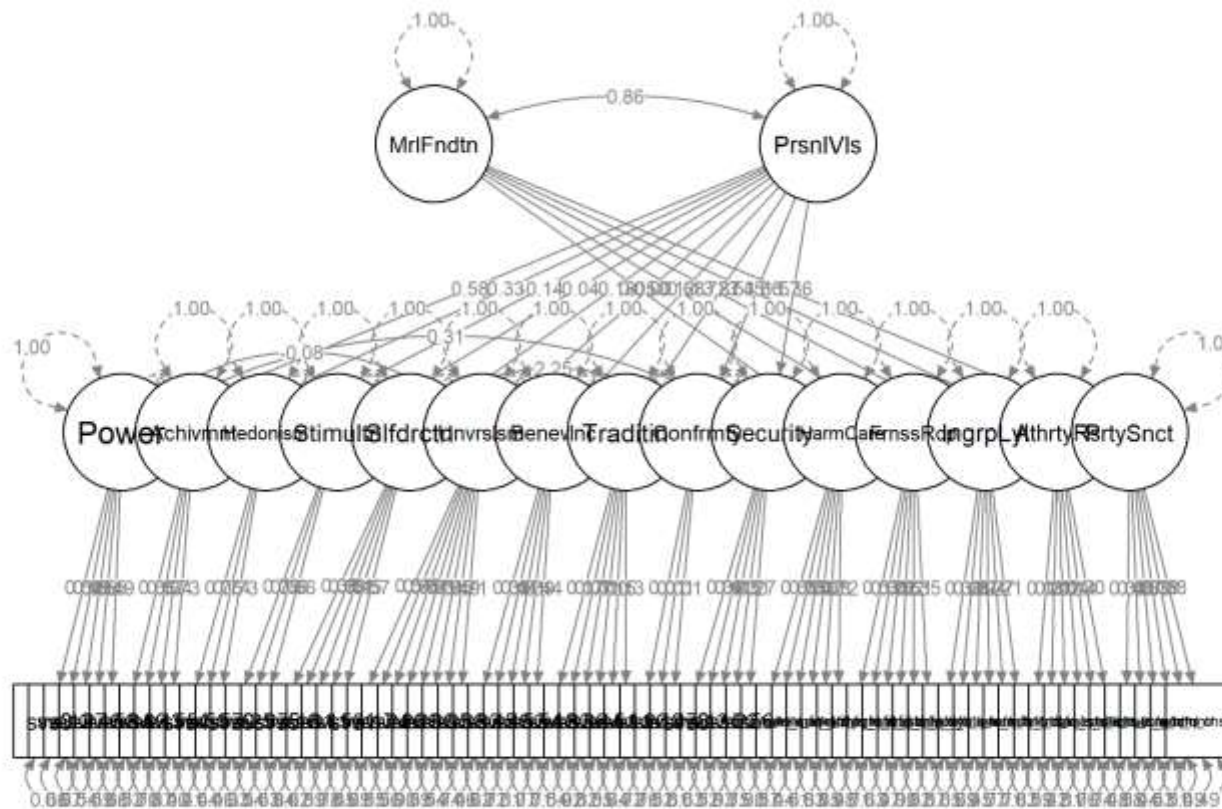
Important: Please note that in this comparison I focused on comparing model fit of theoretically driven models for the relationships between the factors to examine loadings on high-order dimensions, and made only needed adjustments in modification indices to get the models to converge. Therefore, fit for all models is not optimal, and although the model plots provided below adhere to the expected theoretical relationships for both personal values and the moral foundations, specific loadings should be interpreted with caution.

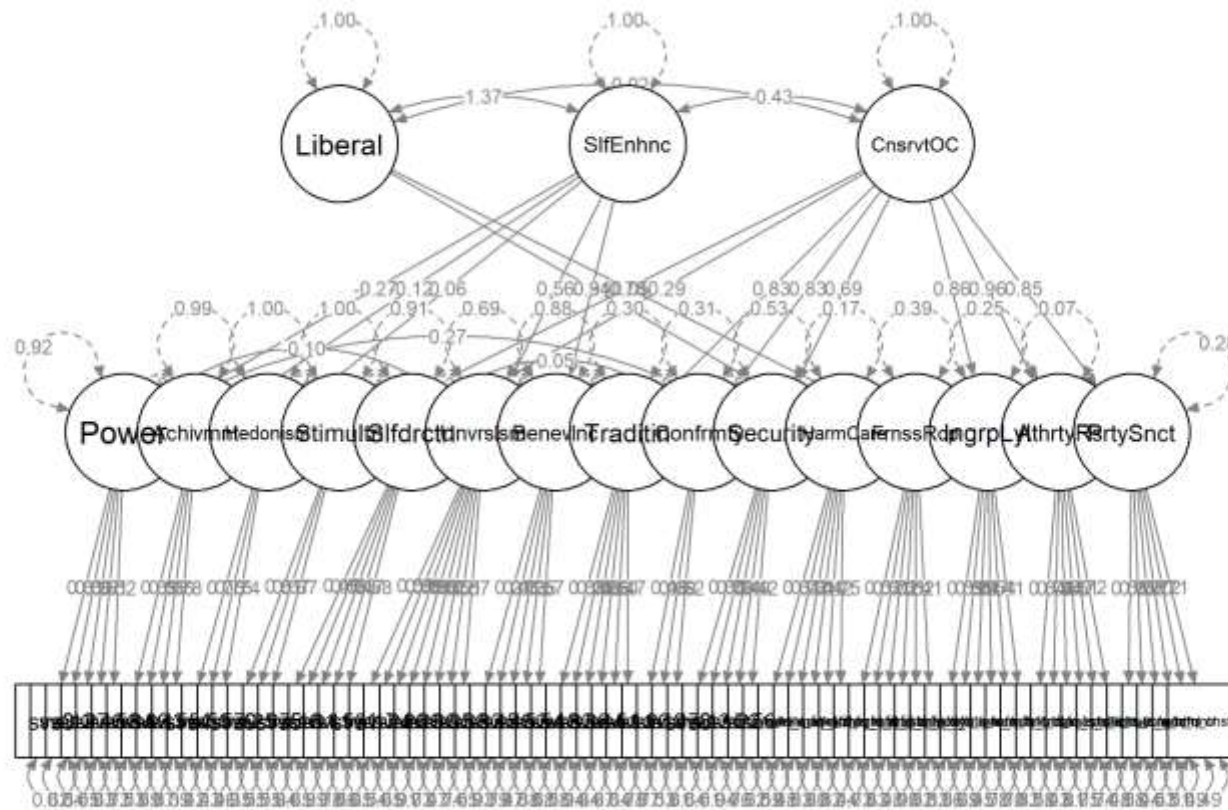
(CFA) Model 1: One Factor



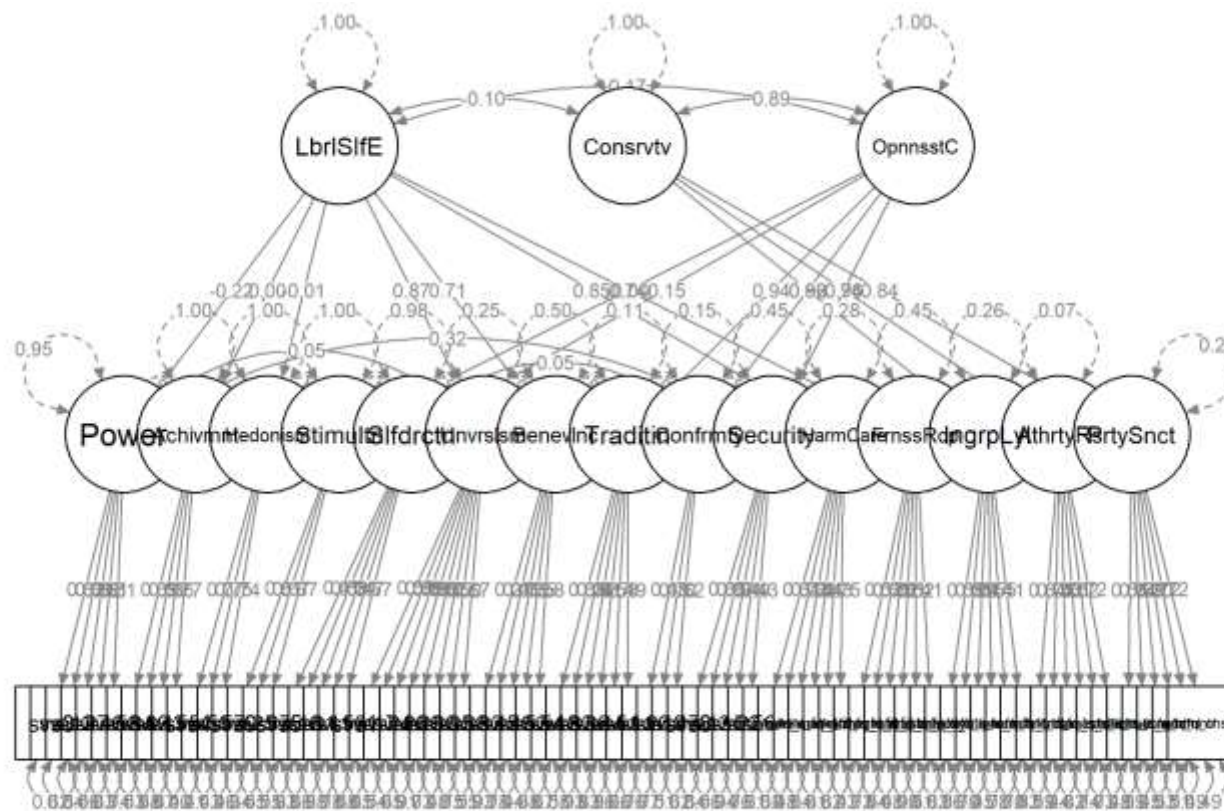
The diagram illustrates a hierarchical network of brain regions. At the top level, two nodes labeled 'Lbr' and 'Cns' are connected by a bidirectional arrow with a weight of -0.04. Each has a self-loop with a weight of 1.00. Below them are 18 nodes representing various brain regions: Pwr, Ach, Hdn, Str, Sif, Unv, Bnv, Trd, Cnf, Scr, Hrc, FrR, InL, AtR, and PrS. These nodes are connected to a third level of nodes, which are further connected to a bottom level of nodes. The diagram includes numerical values for connections and self-loops, indicating the strength of the relationships.

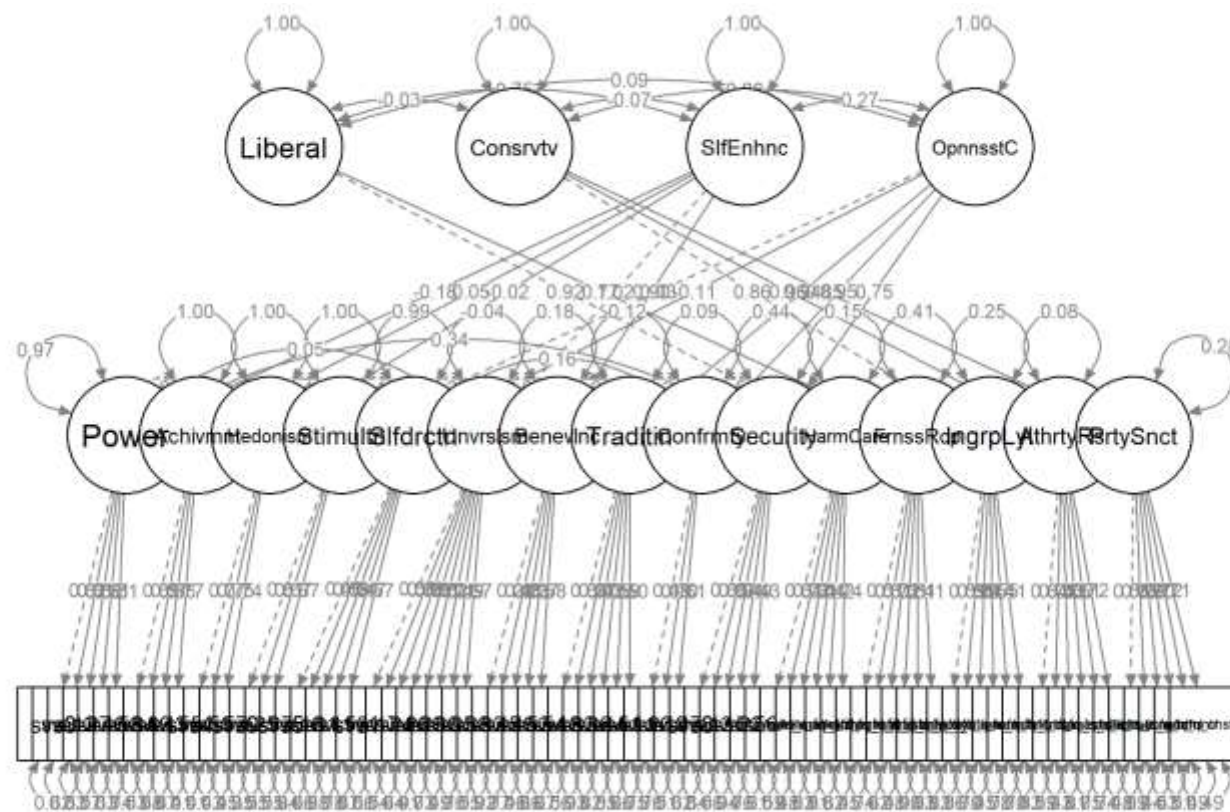
(CFA) Model 3: 2 factor values and moral foundations



(CFA) Model 4: 3 factors, combining binding with CO

(CFA) Model 5: 3 factors, combining individualizing with SET



(CFA) Model 6: 4 factors

Summary of factor analyses

Exploratory and confirmatory factor analyses were in support of individualizing moral foundation, binding moral foundations, self-enhancement versus self-transcendence, and openness-to-change versus conservation, as four unique high-order dimensions.

Additional tables**Personal values and moral foundations meta-analytic effects with reliability correction**

Hunter & Schmidt (2004) method

	Power		Achievement		Hedonism		Stimulation		Self-direction	
Harm-care	-.40		-.24		-.17		-.10		-.12	
95% CI	-.57	-.24	-.39	-.08	-.24	-.10	-.19	-.02	-.31	.06
Fairness-reciprocity	-.35		-.15		-.11		-.06		.04	
95% CI	-.47	-.23	-.28	-.03	-.19	-.03	-.11	-.01	-.15	.22
Ingroup-loyalty	.09		-.02		-.25		-.18		-.41	
95% CI	-.12	.30	-.13	.10	-.31	-.19	-.22	-.14	-.57	-.24
Authority-respect	.11		-.03		-.29		-.26		-.48	
95% CI	-.10	.33	-.14	.07	-.38	-.21	-.34	-.18	-.68	-.29
Purity-sanctity	.00		-.06		-.34		-.26		-.45	
95% CI	-.10	.10	-.12	-.01	-.50	-.18	-.37	-.15	-.65	-.25
	Universalism		Benevolence		Tradition		Conformity		Security	
Harm-care	.44		.30		.06		.01		-.11	
95% CI	.19	.68	.20	.39	-.04	.16	-.14	.16	-.32	.10
Fairness-reciprocity	.46		.20		-.09		-.07		-.09	
95% CI	.20	.71	.13	.27	-.31	.12	-.30	.15	-.30	.12
Ingroup-loyalty	-.33		.08		.40		.41		.35	
95% CI	-.54	-.12	-.06	.23	.30	.50	.24	.58	.16	.54
Authority-respect	-.36		.03		.50		.53		.39	
95% CI	-.59	-.13	-.10	.15	.33	.67	.30	.76	.14	.64
Purity-sanctity	-.28		.10		.55		.47		.29	
95% CI	-.45	-.12	-.01	.21	.35	.75	.25	.68	.15	.43

Note: Bolded values represent values-foundations correlations that were consistent and significant across all samples. Meta-analytic effects are using Hunter and Schmidt (2004) and take into account sample size and weighted-mean reliability. Reliability data was missing for the Survey of World Views data (e.g., single item values measures) and for moral foundations in myType, and these were replaced with mean-weighted reliability estimates of the other datasets. Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings*. Sage publications.

Personal values and moral foundations correlations for each sample

	Power	Ach	Hed	Stim	SelfDir	Univ	Benev	Trad	Conf	Secur	α
myPersonality											
Harm-care	-.18	-.05**	-.14	-.13	-.10	.08	.14	.09	.08	.02ns	.79
Fairness-reciprocity	-.10	-.02ns	-.07	-.09	-.04*	.12	.08	-.01ns	.02ns	.02ns	.82
Ingroup-loyalty	.02ns	.02ns	-.09	-.09	-.11	-.17	.05**	.15	.16	.13	.72
Authority-respect	.01ns	.00ns	-.08	-.12	-.13	-.13	.06**	.12	.17	.13	.80
Purity-sanctity	-.07	-.02ns	-.23	-.21	-.24	-.10	.10	.28	.25	.12	.80
α	.77	.92	.84	.80	.88	.90	.94	.80	.80	.79	
myType											
Harm-care	-.20	-.21	-.17	-.11	-.15	.22	.19	.12	.17	.01ns	
Fairness-reciprocity	-.20	-.22	-.20	-.10	-.15	.14	.19	.19	.22	.03†	
Ingroup-loyalty	-.08	-.12	-.15	-.12	-.24	-.06	.10	.20	.25	.16	
Authority-respect	-.12	-.16	-.21	-.17	-.22	-.03ns	.07	.25	.33	.15	
Purity-sanctity	-.07	-.11	-.14	-.15	-.18	-.08	.02ns	.22	.22	.19	
α	.70	.83	.79	.78	.86	.82	.81	.55	.75	.62	
Survey of World Views											
Harm-care	-.18	-.03*	-.05	.02†	.12	.17	.17	.08	.08	.06	
Fairness-reciprocity	-.18	-.01ns	-.10	-.01ns	.20	.19	.18	.00ns	.05	.10	
Ingroup-loyalty	-.07	-.07	-.20	-.09	-.22	-.13	-.10	.27	.16	.08	
Authority-respect	-.02ns	-.07	-.24	-.14	-.33	-.21	-.13	.33	.22	.07	
Purity-sanctity	-.06	-.08	-.14	-.08	-.22	-.13	-.05	.26	.17	.08	

Measuring Morality											
Harm-care	-.22	-.20	-.12	-.10	-.01ns	.15	.20	.14	.07**	.12	.68
Fairness-reciprocity	-.26	-.22	-.15	-.13	-.04ns	.23	.19	.13	.12	.13	.72
Ingroup-loyalty	-.21	-.20	-.15	-.14	-.05ns	.02ns	.13	.21	.18	.23	.64
Authority-respect	-.21	-.19	-.16	-.19	-.13	.09	.12	.24	.24	.18	.64
Purity-sanctity	-.12	-.15	-.07**	-.12	-.08**	-.06*	.08**	.22	.14	.19	.44
α	.66	.76	.73	.72	.54	.66	.66	.47	.66	.56	
Yourmorals.org MFQ											
Harm-care	-.38	-.24	-.16	-.10	-.16	.49	.25	-.01ns	-.07	-.19	.73
Fairness-reciprocity	-.29	-.14	-.04	-.03	.00ns	.48	.12	-.16	-.16	-.16	.66
Ingroup-loyalty	.17	.04	-.22	-.15	-.36	-.38	.11	.30	.38	.34	.72
Authority-respect	.20	.02**	-.26	-.24	-.42	-.42	.05	.41	.51	.41	.75
Purity-sanctity	.06	-.02**	-.39	-.28	-.44	-.34	.13	.51	.49	.28	.84
Yourmorals.org MSS											
Harm-care	-.35	-.22	-.30	-.19	-.15	.29	.28	.11	.12	-.01ns	.75
Fairness-reciprocity	-.31	-.18	-.34	-.19	-.10	.16	.33	.16	.20	.06	.65
Ingroup-loyalty	-.11	-.08	-.29	-.20	-.25	-.08	.21	.20	.27	.19	.60
Authority-respect	-.11	-.11	-.32	-.26	-.26	-.06	.17	.28	.35	.18	.65
Purity-sanctity	-.02*	-.05	-.29	-.24	-.27	-.14	.08	.27	.29	.21	.55
α	.69	.69	.80	.77	.62	.80	.66	.61	.69	.63	

Note: Due to the large sample size, most correlations were $p < .001$, we therefore only flagged exceptions: † $p < .10$, * $p < .05$; ** $p < .01$; ns $p > .10$. myType moral principles and Survey of World Views moral principles were only provided as aggregates with no reliability data. Survey of World Views used SSVS with single items for each value category, therefore no reliability is reported. Bolded values represent values-foundations correlations that were consistent and significant across samples.

Sinusoidal shape consistency values-foundations for each sample

	myPersonality			myType			Survey of World Views			Summary
	SET	CO	Dominant	SET	CO	Dominant	SET	CO	Dominant	Dominant
Harm-care	.55*	.49*	SET	.73**	.29	SET	.86***	-.17	SET	SET
Fairness-reciprocity	.63**	.12	SET	.68**	.41*	SET	.76**	-.24	SET	SET
Ingroup-loyalty	-.25	.94***	CO	.17	.82***	CO	.02	.79**	CO	CO
Authority-respect	-.16	.93***	CO	.26	.78**	CO	-.10	.84***	CO	CO
Purity-sanctity	.14	.84***	CO	.10	.85***	CO	.02	.80***	CO	CO

	Yourmorals-MFQ			Yourmorals-MSS			Measuring Morality			Summary
	SET	CO	Dominant	SET	CO	Dominant	SET	CO	Dominant	Dominant
Harm-care	.82***	-.25	SET	.79**	.19	SET	.78**	.20	SET	SET
Fairness-reciprocity	.69**	-.55*	SET	.72**	.34	SET	.75**	.24	SET	SET
Ingroup-loyalty	-.29	.94***	CO	.24	.79**	CO	.50*	.54*	CO	CO
Authority-respect	-.28	.95***	CO	.25	.81***	CO	.50*	.59*	CO	CO
Purity-sanctity	-.06	.91***	CO	.04	.91***	CO	.30	.68**	CO	CO

Note. SET-shape (self-transcendence versus self-enhancement) and CO-shape (conservation versus openness-to-change) values were adapted from Boer and Fischer (2013). Consistency effect size guide: 0.4 - low (*); 0.6 - moderate (**); 0.8 - strong (***). Consistent effects across the two datasets are marked in bold.

Summary of suggestive findings from the literature for values-foundations links

Factors	Graham et al. (2009)	Sverdlik et al. (2012)	Boer & Fischer (2013)	Feldman et al. (2015)
Main aim of article	Introducing moral foundations as a unique construct	Theorizing on cross-cultural differences in morality using values	Meta-analysis of social attitudes and values	Examining values and unethicity
Values dimensions				
Self-enhancement	-	-	Low authority-respect	Low on morality overall
Self-transcendence	High harm and fairness	High harm and fairness	High harm and fairness	High harm and fairness
Openness-to-change	-	Low authority, purity	Low fairness	-
Conservation	High ingroup, authority, and purity	High authority and purity	High authority and purity	High authority
<i>Note.</i> Harm = harm-care, fairness = fairness-reciprocity, ingroup = ingroup-loyalty, authority = authority-respect, purity = purity-sanctity.				

Correlations between values, moral foundations, and morality factors

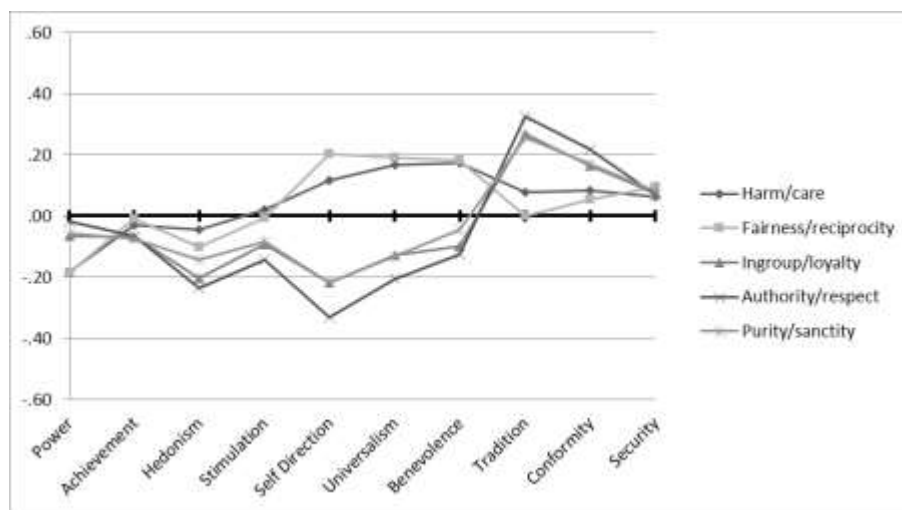
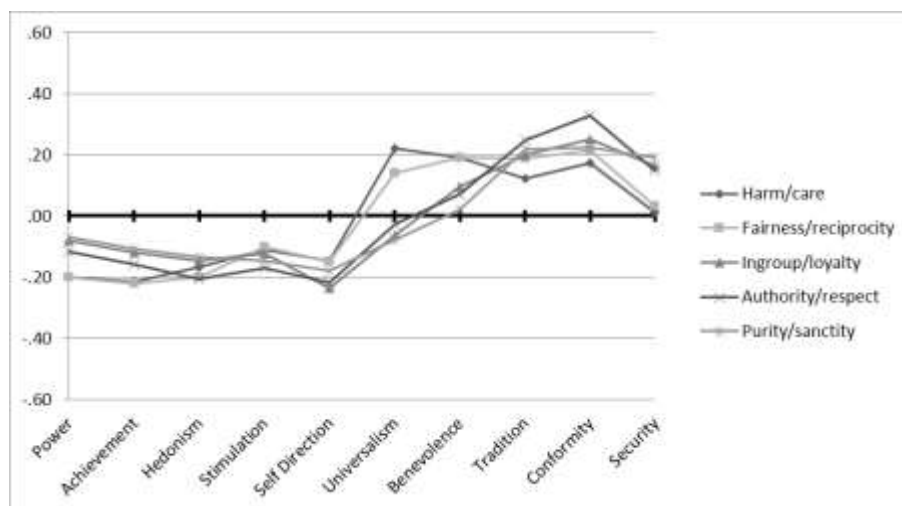
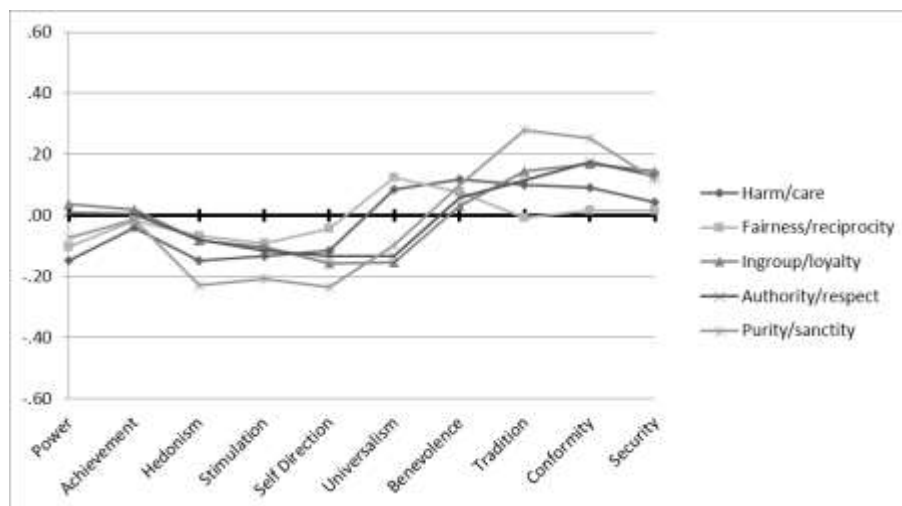
	Dictator game	Heinz and the drug	Moral identity
Moral foundations			
Individualizing: Harm	.088**	.139***	.160***
Individualizing: Fairness	.144***	.225***	.165***
Binding: Ingroup	.103***	.217***	.140***
Binding: Authority	.128***	.296***	.137***
Binding: Purity	.083**	.149***	.065*
Individualizing overall:	.131***	.207***	.180***
Binding overall:	.127***	.270***	.136***
Personal values			
SET: Power	-.130***	-.127***	-.185***
SET: Achievement	-.106***	-.131***	-0.047
SET: Hedonism	-.102***	-.112***	-.155***
CO: Stimulation	.010	-.133***	-.085**
CO: Self Direction	-0.019	-.081***	-.090***
SET: Universalism	.130***	0.025	.127***
SET: Benevolence	.129***	0.048	.198***
CO: Tradition	.061*	.192***	.094***
CO: Conformity	.036	.243***	.098***
CO: Security	-.010	.076**	0.047
SET overall	.181***	.127***	.211***
CO overall	.026	.215***	.125***

Note. SET = self-transcendence versus self-enhancement. CO = conservation versus openness-to-change.

* $p < .05$; ** $p < .01$; *** $p < .001$; Correlations over $|\cdot| \geq .09$ are $p < .001$

Additional figures

Personal values and moral foundations correlations plots per sample



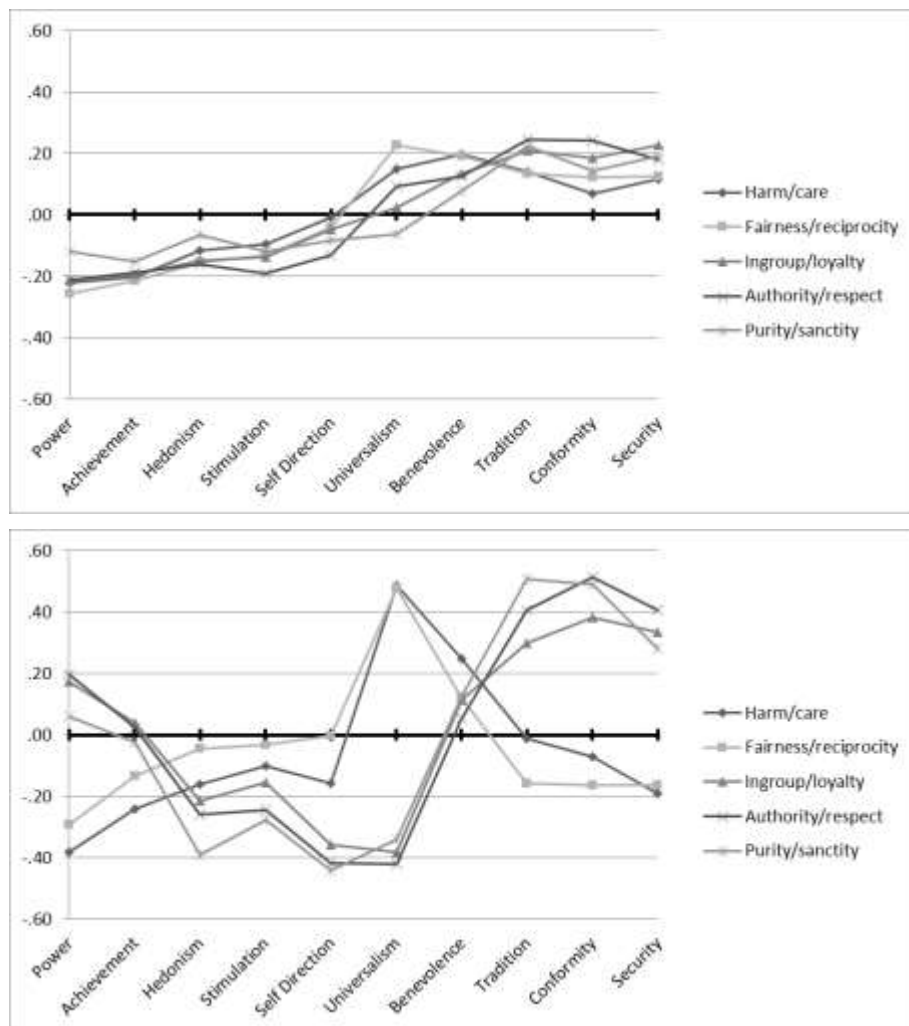


Figure 1. Personal values and moral foundations correlations plots per sample. The first plot is for myPersonality, the second plot is for myType, the third plot is for Survey of World Views, forth plot is for Measuring Morality, fifth is for yourmorals.org.

Additional theoretical and empirical implications and future directions

Samples and reliabilities

We used very large datasets to test our hypotheses, yet these data were not collected solely for the purpose of testing the values-foundations link and the relevant items were only part of much larger data collections. We chose this approach in aim for high power and generalizability, yet we expect that more targeted and well-controlled data-collection would result in stronger links and larger effect-sizes.

We note differences in the effect size found across samples, with the yourmorals.org sample showing stronger correlations and overall patterns between values and moral foundations than the other samples, despite being the largest sample. The samples vary by a number of factors, so it is hard to draw any definite conclusions as to the exact factor driving these differences, yet the yourmorals.org sample is primarily intended for giving participants feedback about morals and it uses the full scales of SVS-57 and MFQ-32. Meaning that participants who took part in yourmorals were probably already focused on morality possibly resulting in higher contemplation of values and moral foundations. Also, yourmorals.org employed the most comprehensive scales currently available to researchers in assessing personal values and moral foundations possibly allowing participants to better express nuances in their values-laden and moral thought.

The reliabilities of the scales also varied between the datasets, and some of the reliabilities were low. Scale reliability is an issue long debated in the values literature, as values researchers aim to strike a balance between covering all 10 personal values with several items and having to face time limitations and consider participants' survey cognitive-fatigue. The low reliabilities in our samples are typical for the instruments used (Schwartz, 2003, 2006). The lowest reliabilities, for example, are from Measuring Morality, which used PVQ-21 for

measuring personal values and MSS-S for measuring the moral foundations. In both scales, each of the theories' dimensions were measured by only few items, each of the items trying to tap a very abstract value. Schwartz (2003, 2006) concluded the issue of low reliabilities by summarizing that “despite low reliabilities these values predict behavior and attitudes systematically” (2006, p. 14) and that “meaningful and substantial associations have been found between two-item value indexes and other variables” (2003, p.277).

Values circumplex and sinusoidal patterns

Boer and Fischer (2013) introduced a methodology that quantifies the overall fit of a relationship pattern with the expected sinusoidal patterns of the values theory circumplex. To date, only few studies used this methodology, mostly in meta-analyses (i.e., Boer & Fischer, 2013; Feldman et al., 2015; Fischer & Boer, 2015). In this article, shape consistencies were an important methodological approach in assessing a theorized pattern of relationships between values and foundations to provide a high-level abstract overview of a large number of complex relationships (50 overall, 10 values by five moral dimensions). We believe that the shape-consistency approach is crucial in enabling a simplification of the complex values patterns to meaningful understandable conclusions.