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Social Mindfulness Across the Globe

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NVD, RM, and PVL initiated, designed and led the research. NVD and PVL wrote and contributed equally to the manuscript. MG analyzed the data. All other authors are listed alphabetically. EIB and RM processed the data, AR performed statistical analyses. All authors contributed to the initial study design, helped collect the data, discussed the findings during conferences and other meetings, provided feedback on the drafts, and approved of the final manuscript.

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Abstract

Humans are social animals, but not everyone will be mindful of others to the same extent. Individual differences have been found, but would social mindfulness also be shaped by one's location in the world? Expecting cross-national differences to exist, we examined if and how social mindfulness differs across countries. At little to no material cost, social mindfulness typically entails small acts of attention or kindness. Even though fairly common, such low-cost cooperation has received little empirical attention. Measuring social mindfulness across 31 samples from industrialized countries and regions (N = 8,354), we found considerable variation. Among selected country-level variables, greater social mindfulness was most strongly associated with countries' better general performance on environmental protection. Together, our findings contribute to the literature on prosociality by targeting the kind of everyday cooperation that is more focused on communicating benevolence than on providing material benefits.

Significance Statement

Cooperation is key to well-functioning groups and societies. Rather than addressing high-cost cooperation involving giving money or time and effort, we examine social mindfulness – a form of interpersonal benevolence that requires basic perspective-taking and is aimed at leaving choice for others. Do societies differ in social mindfulness, and if so, does it matter? Here we find not only considerable variation across 31 nations and regions, but also a strong association between social mindfulness and countries' performance on environmental protection. We conclude that something as small and concrete as interpersonal benevolence can be entwined with current and future issues of global importance.

Main Text

Introduction

Most common, everyday acts of cooperation require very little effort. For example, it does not take much to step aside to let someone pass on a sidewalk; yet it is likely to be greatly

appreciated. However, most research on human cooperation is based on tasks that require some real effort or investment that makes other-regard come at a cost. Cooperation in these tasks actually means “costly behavior performed by one individual that increases the payoff of others” (1, p. 454). Although this narrow technical definition rightly fits the methods, conclusions are often stated in much broader terms in which cooperation implies “any coordinated behavior that is mutually beneficial” (1, p. 454). We aim to address this discrepancy and increase our understanding of human cooperation by concentrating on global differences in benevolent perspective taking rather than on cooperative tendencies that focus on material outcomes and thus individual sacrifice.

To illustrate such daily cooperation, imagine Alex and Mary arriving late for New Year’s drinks at their workplace. Catered by a local wine shop, prefilled glasses are offered on a table for self-service. Although they had already decided that they both wanted a glass of red wine, Mary notices that there are several glasses of Cabernet Sauvignon, but only a single glass of Merlot. Because Alex is momentarily busy, Mary picks first. What to choose? If Mary decides to take the Merlot, Alex would be left with only one choice of red wine. Wanting to be nice, Mary decides on the glass of Cabernet Sauvignon. Such daily dilemmas and the ensuing behavioral decisions are the domain of *social mindfulness*, or “being thoughtful of others in the present moment, and considering their needs and wishes before making a decision” (2, p. 18). The construct has been operationalized as “making other-regarding choices involving both skill and will to act mindfully toward other people’s control over outcomes” (3, p. 86). Cooperative decisions like these are shaped by individual and situational factors (4–6); here we investigate possible cross-national differences.

Understanding cooperation has been a core topic in the behavioral sciences (7), and investigating how people balance self- with other-interest at a cross-national level is a popular topic. Such research has predominantly targeted costly cooperation, demonstrating striking differences (e.g., 7–9). But what about *low-cost* cooperation and how it might vary across countries? Surprisingly, research to date has not offered much evidence regarding this rather common form of cooperation. Hence, the goal of the present research is to provide such information in a first large-scale comparison of social mindfulness across 31 industrialized countries and regions. To identify potential explanations, we additionally examine possible associations between social mindfulness and several relevant country level variables like income, inequality, collectivism, trust, and environmental protection.

Social mindfulness and low-cost cooperation. In the current literature, cooperation typically involves a cost: In an interdependent situation, people face a choice between increasing their private gains (or reducing private losses) or increasing the greater good. Although there may be situations in which self-interest aligns with what is good for others (10), many situations require some give and take in which personal costs are incurred to reach a greater goal. Decades of research have yielded considerable progress on the scientific understanding of this kind of behavior, providing numerous explanations for cooperation. For example, reciprocity and concern for reputation seem to promote cooperation more than conformity (11, 12). In most cases costs are made strategically, based on outcome distributions with specific self-other allocations that are explicitly described in the task instructions. Examples are dictator games (13) or measures of social value orientation (SVO), in which participants divide money or valuable points between themselves and someone else (14, 15). The material outcome is important and cooperation always costly. Conclusions from such research do not automatically apply to the domain of low-cost behaviors that are such an intricate part of what is commonly understood as cooperation.

The primary distinction of social mindfulness is that instead of weighing material costs and benefits, it implies a ‘social mind’ to recognize and meet others’ needs and wishes in the present moment at little to no cost to the self. Summarizing the construct as introduced in previous literature (2, 3), social mindfulness entails benevolence with regards to the needs and interests of others. More specifically, the projected outcome of socially mindful behavior is realized at the

interpersonal relation-level, and not through the exchange of goods or services (e.g., helping). A target's feeling of being acknowledged and valued often matters as much or more than material considerations (16, 17). Returning to our wine selection example, it does not matter whether Alex (the second chooser) eventually picks the Cabernet or the Merlot; the best outcome is that Alex notices that Mary has left some choice. Thus, the construct of social mindfulness reflects to what extent people consider others and demonstrate their broader awareness of others when making decisions with wider consequences (2).

Social mindfulness can be shaped by a variety of factors that are based on the self (e.g., individual differences) and others (e.g., social context). For example, research on individual differences shows rather stable associations with traditionally prosocial personality traits (4). Social mindfulness predicts charitable giving (18) and prosocial behavior in organizations (19). Furthermore, neural patterns when making socially mindful decisions are consistent with mentalizing and perspective taking (20). From a perceiver's perspective, being socially mindful promotes cooperative behaviors in others (21). At the same time, social mindfulness is influenced by how well one knows the others that are part of an interaction or how trustworthy they are deemed to be based on face perceptions (3). In intergroup contexts, people can be less socially mindful – to the point of being socially hostile – when interacting with outgroup members (5) or higher-class targets (6).

To be socially mindful, people need to realize that their individual decisions will affect the current situation for others as well as for themselves. It requires having a theory of mind and/or perspective taking to realize that they can make other-regarding choices. This seems especially important for behaviors that come at little to no costs to the self, such as acts of thoughtfulness, generous gestures, or simple kindness. However, just seeing the possibility is not enough; action is required as well. Social mindfulness encapsulates this combination of seeing the possibility of low-cost other-regarding decisions and acting upon it (3).

Social mindfulness thus provides a new perspective on prosociality that emphasizes the importance and influence of basic social awareness in decision making in interdependent situations (2). For example, to behave prosocially by giving an interaction partner the chance to talk, one needs to realize that the other may have the desire to do so. Or closer to our operationalization, one needs to see that taking a unique product from a shared set (e.g., the one glass of Merlot among three glasses of Cabernet Sauvignon) will constrain others' subsequent choice. Because people usually appreciate choice and tend to experience having choice as rewarding (22), providing others with a choice can be construed as socially mindful.

Lastly, social mindfulness can "prime the pump" for the development of cooperation. In interdependent contexts, full cooperation is rarely realized straight away. Rather there are complex dynamics – interacting decision-makers may start with small moves, reading the situation, and perhaps signaling their cooperative intent. These dynamics facilitate reciprocity and the growth of trust-based cooperation, building on existent social preferences. Social mindfulness can be a precursor to these dynamics, and decision-makers who are more socially mindful may actualize the benefits of cooperation more readily than those with low social mindfulness and its presence may facilitate the emergence of collectively efficient dynamics.

In the current research, we used the social mindfulness (SoMi) paradigm to measure social mindfulness (2, 3). In a dyadic allocation task, the first mover picks a product from a product set, and the second mover picks a product from the remaining items (similar to the wine selection example). The first mover is considered to be socially mindful if the second mover still has choice, i.e., has more than one type of product to choose from. The costs involved are limited to the mental effort spent on considering the options for self and other, and possibly foregoing one's own slight preference among basically equivalent products of very modest material value (see method section). This makes social mindfulness a specific form of low-cost cooperation. By not relying on language comprehension, the SoMi paradigm furthermore offers an intuitive and

nonverbal way to assess social mindfulness, which is yet another distinction from many extant measures of cooperation that makes it especially suitable for cross-national research.

Cross-national perspectives. The cross-national perspective on cooperation has generated strong interest in recent years. Prosocial tendencies, assessed via behavior in ultimatum bargaining games, dictator games, and public goods dilemmas, as well as instrumental cooperation in the form of punishing free-riders, show considerable variation across diverse cultures and populations (8, 23, 24). These findings suggest societal differences in cooperative strategies – the ways in which individuals and groups seek to promote cooperation through reciprocity or punishment. However, these conclusions are predominantly based on outcome interdependence settings in which cooperation typically entails high costs that are material in nature; much less is known about societal or regional differences in situations where costs are negligible and outcomes are not material.

The current research extends existing cross-national comparisons of cooperation by investigating social mindfulness as a specific form of low-cost cooperation in which credibly showing benevolence is more important than the material outcome. Given the novelty of the concept and the relative scarcity of research on cross-national differences in prosociality, this investigation may be described as empirical, curiosity-driven research. Our empirical model has two steps. First, we investigate cross-national variations in social mindfulness among modern, industrialized, and digitalized societies (cf. 8). Second, we examine whether such differences would be related to broader manifestations of prosociality and societal functioning, using three themes derived from the broader literature on cooperation: (I) trust and social preferences, (II) key variables of societal and economic functioning, and (III) demographics.

Examined in the first theme, trust and reciprocity are a given in cooperation research (25, 26), next to social preferences (14, 27). Assuming that prosociality as measured using ultimatum game offers and helping strangers has been found to decrease with a country's economic productivity, our second theme examines the link of social mindfulness with quantified indicators of national prosperity and inequality like Gross Domestic Product (GDP) as well as the Gini index (9, 28). Furthermore, straightforward explanations could be found in collectivistic versus individualistic orientations. Hence, we include Hofstede's cultural dimensions (29) – with the caveat that this particular conceptualization is not undisputed. We furthermore enter previously used country level indices like civic cooperation (30), competitiveness, rule of law (26), democracy, religiosity (31), and environmental performance (EPI) (32). The latter is meant to see if local explanations for cooperation relate to a general sense of social mindfulness in which benevolent interest in others includes general care for the shared environment within nations. In the third theme we examine if age, education (self and parental), socioeconomic status (33), and other common factors are related with social mindfulness, both at individual and country level.

Present research. Although urbanized western cultures are well-represented in our samples, we aimed to cast a wider net over the world to include modern, industrialized, and digitalized nations and regions from, for example, Eastern Europe (Czech Republic, Poland, Romania, Russia), the Middle East (Israel, Turkey), East Asia (China [including Hong Kong], India, Indonesia, Japan, Singapore, South Korea), Latin America (Argentina, Chile, Mexico), and Africa (Pretoria region of South Africa). An overview of the specific samples and targeted countries and regions is provided in the Materials and Methods section and illustrated in Figure 1; see Table S1 for details.

Remarkably, some cross-cultural experiments, even among non-western societies, have revealed little variation among college students (34). Still, we targeted younger people (aged 18–25), often students in social or behavioral sciences, exactly because a sample of young, well-educated participants as often used in past research would provide a relatively conservative first test to build upon in the future. Moreover, the relative homogeneity of student samples makes it more likely that national differences in social mindfulness reflect true cultural differences, and not some other variables like age or education (35).

We explored social mindfulness in two subsequent steps: (i) are there cross-national differences, and if yes (ii) can we relate these to trust-based measures and social preferences, economic, environmental, and/or morality-oriented indices at country level, or selected demographic variables? Although expecting to see differences in country scores, we decided to advance no formal hypotheses regarding ranking or the direction of possible associations with our selection of country level variables. To distinguish between individual and cross-national differences, we also examined social mindfulness at individual level. Finally, we used SVO as an established way of measuring costly, outcome-oriented preferences (15) to compare to and illustrate social mindfulness.

Results

SoMi

Social mindfulness across countries. First, we established that countries differed in social mindfulness. Results showed that the variance was larger than zero, Likelihood Ratio Test (LRT)(1) = 525.34, $p < .001$. To provide converging evidence, we also estimated an Ordinary Least Squares (OLS) ANOVA on SoMi as outcome variable and country as predictor. This showed a significant main effect, $F(30, 8323) = 22.27$, $p < .001$, proving the between-countries variability to be statistically larger than the average within-country variability. Finally, a Kolmogorov-Smirnov test showed that the distribution of the country means was not uniform as would have been expected by chance ($p < .001$). Ranking and an overview of means are provided in Figure 1. Combining the three tests, we can confidently conclude that the size of SoMi-variability across countries is well above within-country average variability and above sampling error. Moreover, we found no sizable correlation between sample size *N* and the means of social mindfulness (SoMi) across countries ($r = -.0109$), nor with the countries' standard deviations ($r = -.0042$). See Table S2 for more details.

Simple relations. Next, we looked at simple relations at individual and country level. Table 1 shows that SoMi was positively related with SVO, both at the individual (.25, $p < .001$) and at the country level (.68, $p < .001$). This means that within each country, greater prosocial orientations were associated with greater social mindfulness. The strong associations at both levels of analysis provide evidence for meaningful shared as well as unique contributions of both variables to prosocial behavior (18). Although a very small effect, trust in others was associated with SoMi at the individual level, but not at county level. Trust perceived by others was not related with SoMi at individual or country level. Note, however, that the reliability for both trust scales was rather low ($\alpha = .58$). Also note that measures of trust and SVO were taken at the same time as social mindfulness (endogenous), unlike the demographic variables (exogenous). See below for more SVO-results.

Table 1 also provides the demographic results. Generally speaking, SoMi was not meaningfully associated with these variables at an individual level, which was stable across countries. Even though the correlations with age, gender, and subjective socioeconomic status were statistically significant, this was mainly due to the large sample size. The effect sizes were so small that they can be considered negligible. At country level, SoMi was positively associated with parental education, and negatively with socioeconomic status and number of sisters.

In Table 2 we report associations between SoMi and selected key variables that only vary at the national level. SoMi was positively associated with economic prosperity as reflected in GDP and GNI (both per capita), Rule of Law, economic competitiveness, and, above all, environmental performance (EPI). On the other hand, SoMi was negatively associated with economic inequality (Gini index, $p = .051$) and religiosity. Among the Hofstede dimensions, only Power Distance was associated with SoMi, suggesting that less distance goes together with greater social mindfulness; we did not find associations between Individualism Versus Collectivism and SoMi.

Prediction models. To generate a broader picture and to identify the best predictor(s) overall, next we compared multiple models in which predictors were considered together (*7*). Note that these models were used to statistically support the associations and do not imply causal inferences. We found that among all variables, environmental performance (EPI) was the best (and only) predictor of social mindfulness (SoMi), $b = 0.04$, $SE = 0.01$, $t(28.32) = 4.12$, $p < .001$, suggesting that greater social mindfulness is associated with greater concern with protecting the environment.[*] See Figure 2 for a scatterplot.

SVO

Social value orientation. First, the variance of SVO across countries was larger than zero LRT(1) = 306.01, $p < .001$. An OLS ANOVA with SVO as dependent variable and country as independent variable revealed a significant main effect, $F(30.00, 7990.00) = 14.07$, $p < .001$; a Kolmogorov-Smirnov test indicated that the distribution of the country means was not uniform ($p < .001$). The means are illustrated in Figure 1, showing differences in ranking between SoMi and SVO as well as a general positive association as reported above. At step two (simple relations), SVO followed a different pattern than SoMi: SVO was not associated with most of the demographic variables at individual level. Even though correlations were significant for education (positive) and SES (negative), the effect size was small enough to be considered negligible, and the significance a result of such a large sample. At country level, education was positively associated with SVO, $\beta = .50$, $p = .005$. However, we found practically no associations with our selected key variables and economic indices; only Indulgence versus Restraint (Hofstede) was significant, $\beta = .48$, $p = .010$. SVO results are summarized in Tables S2-S4. We conclude that SoMi and SVO are meaningfully associated, such that they provide evidence for convergence and uniqueness, and that the patterns of correlations with demographical variables, trust, and societal and economic variables show that SoMi functions differently from SVO.

Discussion

Large-scale, industrialized societies differ in low-cost cooperation as operationalized using social mindfulness; in this first and broad overview we found strong support for substantial cross-national variation (Figure 1). This confirms that research on cooperation should look at nation-level differences (cf. 28). Across three broad themes, social mindfulness was associated with individual trust and social value orientation and some societal and economic indices (religiosity, power distance, GDP, Gini), but most strongly with the level of environmental performance within the targeted countries (EPI). We also found limited associations with demographic variables (parental education and socioeconomic status). Ranking and pattern of associations for social mindfulness and social value orientation overlapped meaningfully but not substantially, confirming that low-cost cooperation should be investigated independently from costly cooperation.

Our primary aim was to provide a first overview of cross-national differences in social mindfulness. The proportion of socially mindful decisions differed considerably across the samples in our study. Scores ranged from 46% (Indonesia) to 72% (Japan), with a gradual incline between the lowest and highest values (see Figure 1). This pattern indicates that low-cost cooperation varies across nation-based populations and should be further investigated. Other than costly cooperation measured using tasks with monetary consequences, there is little research on non-monetary, low-cost cooperation, even though “social life also involves low-cost cooperation, such as information sharing, showing respect, and conveying appreciation such as gratitude and compliments” (36, p. 503).

Exploring potential mechanisms in a second step, we organized selected variables in three broader themes. Within the first theme, trusting others was associated with social mindfulness at individual level, but not at country level. A common factor in research on costly cooperation (26,

[*] The association of EPI with SoMi is also significant after Bonferroni correction ($p < .001$).

30, 37), this finding could suggest that functional trust in low-cost cooperation is different from how trust operates in costly cooperation; however, scale reliability was low and conclusions should be treated with caution. Looking at social preferences, we did find the expected positive association with social value orientation, which was moderate at individual level and larger at country level (4). Figure 1 illustrates this correlation, but at the same time shows clear differences of where countries are on the list. This distinction is corroborated by a fully different pattern of associations in step 2 of the analyses across all three themes. Only level of education seems to provide common ground, but even there it concerns parental (SoMi) versus individual (SVO) education. Together these findings provide evidence for the unique place of low-cost cooperation in general and social mindfulness in particular within the broader concept of human cooperation.

The second theme, investigations of selected societal variables and economic indices at country level, showed higher levels of social mindfulness for countries with lower levels of religiosity. This brings to mind that the common positive association between religiosity and subjective well-being strongly depends on societal factors; difficult life circumstances predict higher religiosity and thus greater well-being (38). Social mindfulness seems associated with easier life circumstances, as indicated by associations with GDP, GNI, and Gini. We did not measure individual level religiosity, however, which makes it unclear if and how religiosity and social mindfulness are connected at the personal level. The simple relation between religiosity and cooperation in the literature (e.g. 39) would suggest a positive association (but see 26, 40), and the community-aspect of many religions could well promote social mindfulness, at least within one's own community (2, 5). Additionally, the democratically installed and maintained rule of law showed a positive association with social mindfulness. The negative association with power distance (Hofstede dimensions) points in the same direction: Social mindfulness – low-cost cooperation – is not driven by obeying those in power, but by truly interpersonal relations in which others are seen and acknowledged as equals living under the same norms (3).

Following the third theme, social mindfulness was not correlated at individual level with most of the demographic variables we investigated. Although several correlations were statistically significant, effect sizes were generally too small to be meaningful. At country level, we found that social mindfulness was positively associated with parental education, but negatively with socioeconomic status. Seemingly contradictory, both parental education and socioeconomic status are used as operationalizations of social class. One explanation for the divergent pattern is that parental education reflects what often is described as cultural capital, or class background (41), whereas the social ladder as a measure of subjective social class is based on one's actual economic assessment, or class foreground (42, 43). Foreground and background complement each other, but do not automatically overlap. That social mindfulness is positively related with background cultural capital but negatively with foreground economic hierarchy once more underlines that social mindfulness skips the economic costs. It also shows that social class is and remains a complex and multifaceted phenomenon to define (6).

Among all potential mechanisms we investigated, one solid effect needs to be highlighted. The country-level association between social mindfulness and environmental performance (EPI) that washed out all other relations in our final model suggests that prosocial tendencies may not only be revealed in people's orientation toward *individual* strangers, but also toward a *collective* of strangers with a broader concern for environmental sustainability. This broader concern specifically combines protection of human health with the protection of ecosystems (44). This positive association connects with growing research on the social aspects of biodiversity conservation and sustainability initiatives that suggests that greater social capital is accompanied by greater and more successful environmental protection (45, 46), possibly a form of collective action (47). In terms of the SoMi paradigm, social mindfulness may not only reflect how people leave others choice at a micro level, but also how they may want to leave the broader community of others a reasonably healthy earth to live on at a macro level. Social mindfulness, then, is shaped by a socially interconnected environment in which the awareness of a "we," "us," and "our

future" may all be equally accessible units of thought and action. Among other things, this may promote a social and political climate that helps recognize, address, and reduce climate change.

In the end, what best explains the general picture? Considering all findings, we suggest that social mindfulness may be conceptualized as a specific and effective expression of *social capital* (47–50), a comprehensive perspective on society with important implications for its development and functioning (30). Following one of the definitions, the economic function of social capital is to diminish the costs of formal coordination tasks by using informal social communication channels (51). From a relational perspective, such capital materializes through social interactions that include low-cost cooperation. Requiring no monetary or otherwise effortful investments to acknowledge, confirm, and promote high-trust social relationships, social mindfulness would be specifically set up to do so; the socially mindful person signals benevolence and trustworthiness (2, 3, 21). A promising connection with social capital is also suggested in the ranking of our locations: Japan, highest on the SoMi-list, is traditionally known for stressing the value of social capital (52), and ranks twelfth (of 180) on the GSCI social capital world index (53), while Indonesia, lowest on the SoMi-list, ranks 70. A simple bivariate correlation without corrections learns that social mindfulness and social capital scores are associated at $r(30) = .55$, $p = .002$. Although quantifying social capital is difficult, this is corroborated by the relations we found between social mindfulness and the ensemble of variables lead by environmental performance (EPI), and followed by economic indices (GDP, GNI, Gini), rule of law, power distance, individual and generalized trust, and civic cooperation (tendency only), which all in their own way have been connected to presence and development of social capital (45–47, 51). Future research could develop this.

Limitations and future research. It should be noted that our findings specifically pertain to low-cost cooperation as measured using social mindfulness, and that different results may be obtained when material costs of cooperation become high(er). Higher costs could make self-related thoughts more salient, and thus may move people away from a "we-mode" of thinking that is more natural for low-cost cooperation. Moreover, our explanation of social mindfulness as low-cost prosociality is mainly theoretical. To complete our tests, future research could compare social mindfulness with specific other forms of low-cost (e.g., helping that does not require time or effort) and costly cooperation (e.g., dictator or ultimatum games) in terms of important background psychological variables like personal values, personality (4, 54, 55), trust, intra- and intergroup dynamics, generalized reciprocity, and identification with the collective (56). One suggestion would be that low-cost cooperation is more common and even more intuitive than high-cost cooperation (57, 58). Numerous daily situations lend themselves to simple other-regarding decisions – see our wine choice example – and have more important outcomes at the relational level than with regards to resource allocation. This makes it likely that for many individuals, friendly behaviors are a matter of habit without much deliberation; but only when it does not cost them.

Importantly, the current data provide novel but initial evidence; confirmatory research is certainly needed. Our findings are based on a cross-national investigation among mostly young, college aged individuals, mainly in cities with reasonable access to universities or other institutions of higher education. As much as this constrains generalizability, however, the strength of this approach is that it provided much needed experimental control and comparability between samples in this initial research. For a next step, more general samples could be targeted. Moreover, the mechanisms we examined were derived from three common theoretical frameworks, but, given the novelty of the construct to cross-national comparisons, remain largely exploratory. For example, there may be factors we have not included that could shed more light on why social mindfulness varies across nations and regions. Hence, we strongly recommend follow-up research to include different samples that are representative of other parts of the population and use complementary experimental designs.

Conclusion. Altogether, the current research adds more pieces to the intriguing puzzle of human cooperation. First, we established that there is considerable cross-national variation in low-cost cooperation such as social mindfulness. Second, social mindfulness is meaningfully associated with social value orientation, showing common ground with and differences from cooperation that highlights (material) outcomes and costs to self. Third, social mindfulness is associated with collectively protecting human health and ecosystems in the broadest sense (47). This finding suggests that variations in a simple concept like social mindfulness can be linked to highly consequential outcomes at societal level. We suggest that, ultimately, a comprehensive prosocial package from social mindfulness to environmental concern is adaptive for any society that faces increasing interdependence beyond one's own community, such as international trade or pending conflicts, along with the collective challenge of scarcity in natural resources which impacts future generations of humans and other species.

Materials and Methods

Materials are provided in the Supplementary Information; data are available at DataverseNL.

Experimental design. To examine potential cross-national differences in social mindfulness, we designed a standardized questionnaire that was distributed electronically to the participating researchers and laboratories. Our variables of interest were embedded in a larger project on global differences in social preferences. For instance, the full questionnaire contained two different measures of social value orientation (SVO). In the current paper we focus on social mindfulness as outcome variable. Because it provides a linear, non-categorical measure of SVO, we include the SvoSlider for explanatory purposes; cross-national results for both SVO measures may be further reported and discussed in detail elsewhere. The questionnaire contained some further items that did not pertain to the current research question, and are not reported here. A complete list of variables is provided in the supplementary information (SI text).

Samples and participants. Data were derived from 46 independent samples, involving 31 countries and regions across the globe, covering all continents but Antarctica (for details, see Table S1). To target comparable samples across nations, we primarily targeted student populations between 18 and 25 years of age. Overall, we collected responses from 10,353 individuals. After omitting a number of incomplete answers, we were able to compute a valid SoMi score for 8,354 participants (2,916 males, 4,913 females, 525 did not report), M_{age} = 21.98 years, *SD* = 5.19.

Procedure and materials. Data were collected in the course of 2015. Because a general proficiency in English was expected in most academic settings, the survey was presented in English where possible. However, when deemed necessary by the local research team, the survey was translated into the relevant native language. Our main focus was on students in psychology and/or social sciences, but depending on the population of the local university, students from other areas (like business or economics) were also invited. Where possible, experiments were held in the local research facilities (a dedicated laboratory) or else the survey was distributed online to specifically targeted participant pools. Participation incentives (i.e., monetary compensation, course credits, lottery draws, or no monetary incentive) were offered based on local reimbursement norms for completing such a survey; see Table S1. General ethics approval was provided at the Vrije Universiteit Amsterdam (VCWE), complemented by local approval at various research locations. All participants provided informed consent.

Social mindfulness was measured using the SoMi paradigm. As described in previous research (2), this dyadic task entailed participants choosing one product from an array of products shown onscreen as the first of two people, without replacement. The (imaginary) other person was "someone you don't know and are not likely to meet in the near future." The ratio of products varied between one unique versus two identical products and one unique versus three identical products. An example would be one red among two green apples, or one yellow among three

blue baseball hats. Taking one of the non-unique products (e.g., a green apple or a blue hat) was scored as socially mindful, because it preserved choice for the other person. Control trials offered two versus two or three identical products. For visualizations, see SI text or www.socialmindfulness.nl. There were 24 trials in total that included 12 experimental and 12 control trials, using 12 separate categories of products, all offered in fully randomized order. Social mindfulness was calculated as the percentage of socially mindful choices across experimental trials.

For validation and comparison (3, 4) we measured social value orientation using the SvoSlider, consisting of six consecutive (hypothetical) allocations of money between self and other, resulting in orientations that range from competitive to altruistic; higher numbers indicate higher cooperation (15). We furthermore assessed standard demographics like age and gender, and exploratively asked about the number of brothers and sisters (to check associations with family size), subjective socioeconomic status (SES) (42), relative income (*far below–far above average*), and parental education (*Less than High School–Professional Degree*). We also measured general trust (3 items, e.g., "I completely trust most other people"; $\alpha = .58$) and perceived trust (3 items, e.g., "I think that most other people completely trust me"; $\alpha = .58$ (59). The reliability of these latter scales was rather low, limiting the strength of the conclusions.

At the analysis phase, we related SoMi with various country level variables, including Gross Domestic Product (GDP), Gross National Income (GNI), the Gini inequality index, the Environmental Protection Index (EPI), the Hofstede dimensions (29), and trust as measured in the World Value Survey (WVS). See Table 3 for an overview, a brief description, and source references. We did the same for SVO.

Analytical strategy.[†] To examine if countries differed in social mindfulness, we performed a linear mixed model with SoMi as outcome variable, random intercepts across countries, and only the intercept as fixed effect. The variance of intercepts across countries (i.e., the differences between country means) was tested with a Likelihood Ratio Test (LRT). This was complemented by an Ordinary Least Squares (OLS) ANOVA on SoMi as outcome variable and country as predictor. A Kolmogorov-Smirnov test was used to check uniformity in the distribution of the country means.

Simple relations at individual and country level were estimated using linear mixed models. In each model SoMi was the outcome variable and each variable, in turn, the predictor. Country was the cluster variable for which we estimated the variability of random coefficients. The relation between SoMi and the variable was set both as fixed (average) and random (varying) effects, random across country. Similarly, the intercepts were set as random effects varying across countries. The variables were standardized in such a way that the relation between SoMi and each variable was decomposed in two independent effects: The relations within country (individual level), and the relation at country levels. The former effect can be interpreted as a standard (Pearson) correlation, corresponding to the average correlation across countries; the latter as the correlation one would obtain if the relation was computed on the means of countries in the variables (country level). Nonetheless, all estimations and tests were done on the whole sample. The models presented here also allowed us to estimate the variance of the random effects (intercepts and coefficients).

To estimate the relation between SoMi and selected key variables that only vary at the national level we report bivariate relations across three main domains (Table 2). The data were standardized such that the β-coefficients can be interpreted as the correlation between SoMi and the variable at the country level. The results are therefore very similar to Pearson correlations estimated on the average SoMi score of each country and its value in the target variable.

[†] Strategy for SVO was identical. For a robustness check and alternative analyses for SoMi as a proportion, see Supplementary Information (Tables S5-S7).

However, parameters and tests were derived and run on the whole sample. From the available economic indices, we used variables per capita (P/C) to prevent confounds from the size of the country population. GDP was log-transformed to linearize the relation with SoMi.

We standardized variables and ran all mixed models using R (package lme4) (60) with country (level 2) as the clustering variable. After comparisons with other models through the Akaike and Bayesian information criteria, we selected the model with the best fit (61).

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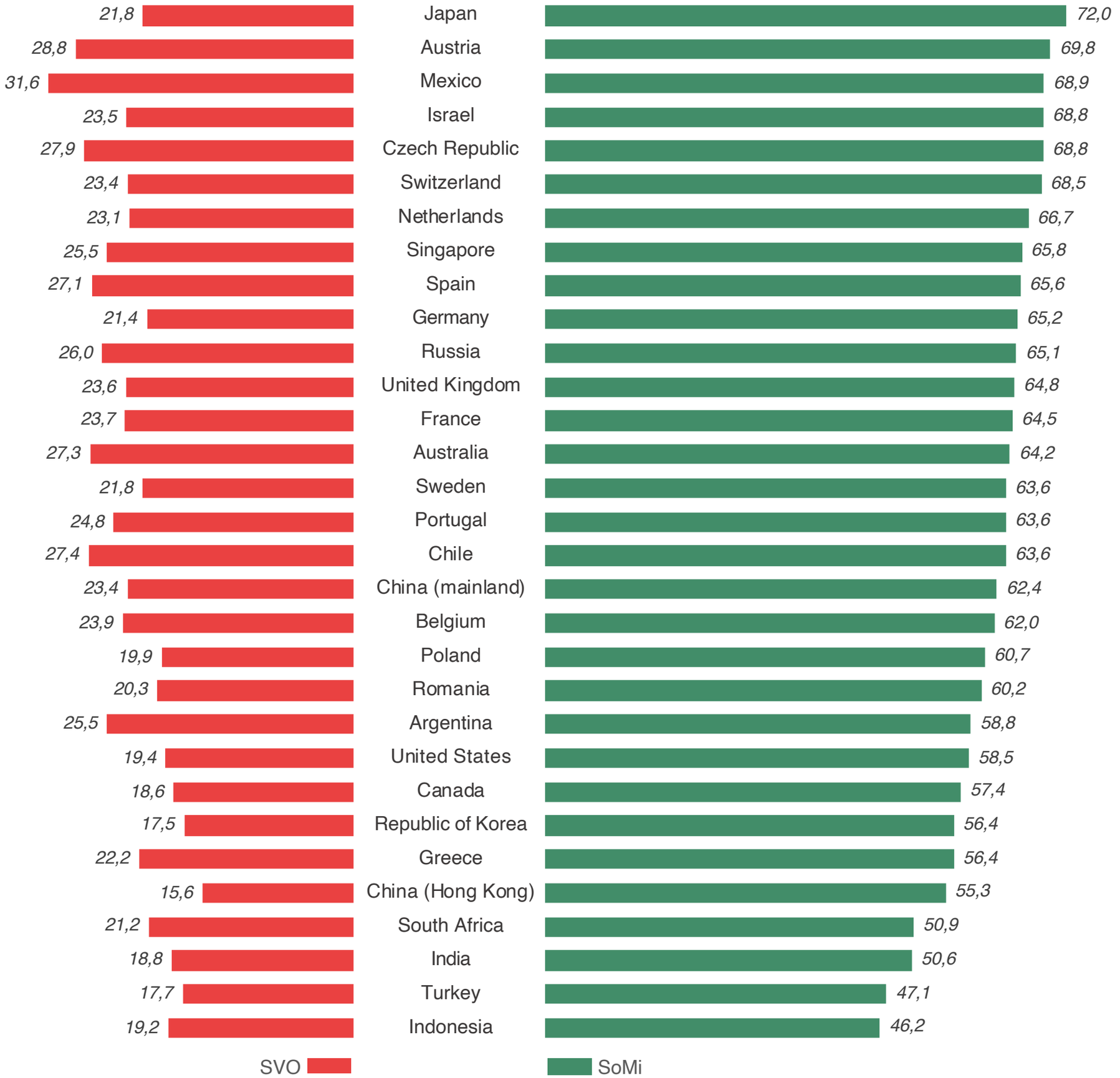
Figure Captions

Figure 1. Distribution of means for SoMi (right panel, ranked low to high,) and SVO (left panel) per country/region.

Figure 2. Scatterplot of social mindfulness (SOMI) and environmental performance index (EPI) per country/region.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28,8 Austria 69,8
31,6 Mexico 68,9
23,5 Israel 68,8
27,9 Czech Republic 68,8
23,4 Switzerland 68,5
23,1 Netherlands 66,7
25,5 Singapore 65,8
27,1 Spain 65,6
21,4 Germany 65,2
26,0 Russia 65,1
23,6 United Kingdom 64,8
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27,3 Australia 64,2
21,8 Sweden 63,6
24,8 Portugal 63,6
27,4 Chile 63,6
23,4 China (mainland) 62,4
23,9 Belgium 62,0
19,9 Poland 60,7
20,3 Romania 60,2
25,5 Argentina 58,8
19,4 United States 58,5
18,6 Canada 57,4
17,5 Republic of Korea 56,4
22,2 Greece 56,4
15,6 China (Hong Kong) 55,3
21,2 South Africa 50,9
18,8 India 50,6
17,7 Turkey 47,1
19,2 Indonesia 46,2
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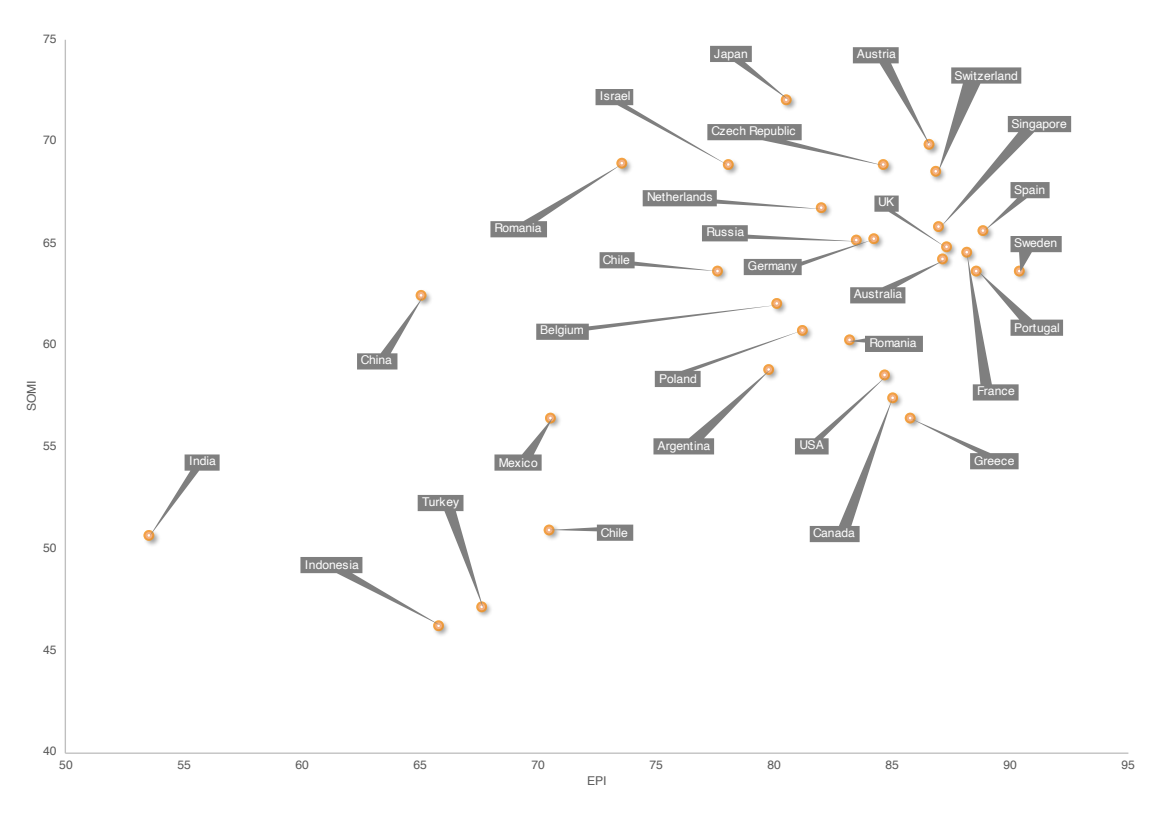
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Table 1. Bivariate relations with social mindfulness within the domains of trust and social value orientation and demographic variables, at individual and country level.

	Individual level					Country level			
	ICC	β	*t*	*df*	*p*	β	*t*	*df*	*p*
Trust and SVO									
SVO	0.37	0.25	22.64	7861	< .001	0.68	4.91	28.03	< .001
Trust	0.51	0.03	2.24	7748	.025	0.02	0.13	28.02	.900
Perceived Trust	0.51	0.00	0.29	7721	.776	-0.07	-0.39	28.02	.702
Demographics									
Education	0.50	0.02	1.83	7645	.067	0.24	1.32	28.00	.198
Parental education	0.43	-0.00	-0.14	7604	.888	0.52	3.23	28.07	.003
Age	0.49	0.02	1.96	7675	.050	0.30	1.67	28.01	.106
Gender	0.51	-0.02	-2.14	7676	.033	0.16	0.87	28.07	.391
Income	0.49	-0.01	-0.85	7594	.398	0.28	1.56	28.06	.130
SES	0.47	-0.03	-2.70	7612	.007	-0.38	-2.20	28.00	.036
Brothers (number)	0.51	0.01	1.00	7647	.319	-0.18	-0.96	28.04	.343
Sisters (number)	0.48	0.01	0.51	7646	.609	-0.37	-2.09	28.09	.046

Note. SVO = social value orientation. Gender: Male = 1, female = 2. SES = socioeconomic status. β may be interpreted as correlation coefficient.

Table 2. Country level bivariate relations with social mindfulness across three domains.

Key Variables	*ICC*	β	*t*	*df*	*p*
Trust (WVS)	0.45	0.27	1.51	25.09	.144
Religiosity	0.41	-0.42	-2.55	25.14	.017
Civic Cooperation	0.44	0.30	1.71	25.08	.099
Rule of Law (2015)	0.45	0.45	2.56	26.03	.016
Democracy Index (2014)	0.50	0.23	1.23	28.01	.229
Competitiveness	0.47	0.39	2.24	28.12	.033
Freedom Index	0.48	-0.31	-1.75	27.97	.091
EPI	0.40	0.60	3.83	27.04	.001
Hofstede Dimensions	*ICC*	β	*t*	*df*	*p*
Power Distance	0.44	-0.42	-2.48	27.03	.020
Individualism	0.47	0.30	1.67	27.05	.107
Masculinity	0.48	0.21	1.13	27.05	.267
Uncertainty Avoidance	0.49	0.11	0.60	27.10	.555
Long Term Orientation	0.50	0.16	0.87	28.05	.392
Indulgence versus Restraint	0.49	0.28	1.49	27.10	.149
Economic Indices	*ICC*	β	*t*	*df*	*p*
GDP P/C (2015)	0.45	0.46	2.76	28.06	.010
GNI P/C (2015)	0.46	0.47	2.68	27.05	.013
Gini Index	0.47	-0.36	-2.04	28.01	.051

Note. EPI = Environmental Performance Index. GDP P/C = Gross Domestic Product per capita. GNI P/C = Gross National Income per capita. Gini Index = Income inequality. β may be interpreted as correlation coefficient.

Table 3. Country level variables; descriptions and sources.

	Description	Source
Civic cooperation	Norms for civic cooperation.	World Value Survey (wave 6): missing values added from European Values Study. Computed following (30).
Competitiveness	The Global Competitiveness Index (GCI) follows the performance of countries on 12 facets of competitiveness.	2015 World Economic Forum (62).
Democracy	Countries' state of democracy based on five categories: Electoral process and pluralism, civil liberties, the functioning of government, political participation and political culture.	Economist Intelligence Unit; http://www.eiu.com/Handlers/WhitepaperHandler.ashx?fi=Democracy-index-2014.pdf&mode=wp&campaignid=Democracy0115
Environmental Protection Index (EPI)	The Environmental Performance Index (EPI) ranks countries on 24 performance indicators across ten issue categories covering environmental health and ecosystem vitality. This provides a measure of how close countries are to established environmental policy goals.	http://epi.yale.edu
Freedom Index	Degree of freedom available to journalists, constructed from expert responses on countries' pluralism, media independence, media environment and self-censorship, legislative framework, transparency, and the quality of the infrastructure that supports the production of news and information.	World Press Freedom Index 2015; https://index.rsf.org/#!/
GDP/GNI	Gross Domestic Product/Gross National Income.	World Bank (US2005 constant), values 2014, 2015; http://data.worldbank.org
Gini	Coefficient of economic inequality.	https://www.cia.gov/library/publications/the-world-factbook/rankorder/2172rank.html
Hofstede dimensions	Six basic dimensions of culture: Power Distance (PDI), Individualism (IDV), Masculinity (MAS), Uncertainty Avoidance (UAI), Long Term Orientation (LTO), and Indulgence versus Restraint (IVR).	(29); see also www.geerthofstede.nl, www.geerthofstede.com
Religiosity	"Important in life: Religion."	World Value Survey (wave 6); European Values Study
Rule of law	"The restriction of the arbitrary exercise of power by subordinating it to well-defined and established laws" (New Oxford American Dictionary).	http://databank.worldbank.org/data/reports.aspx?source=worldwide-governance-indicators&preview=on#
Trust	"Most people can be trusted."	World Value Survey (wave 6); European Values Study