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Global variation in subjective well-being predicts seven forms of altruism

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Abstract

The geographic prevalence of various altruistic behaviors (non-reciprocal acts that improve others' welfare) is non-uniformly distributed. But whether this reflects variation in a superordinate construct linked to national-level outcomes or cultural values is unknown. We compiled data on seven altruistic behaviors across 48-152 nations, and found evidence that these behaviors reflect a latent construct positively associated with national-level subjective well-being (SWB) and individualist values, even controlling for national-level wealth, health, education, and shared cultural history. Consistent with prior work, we found that SWB mediates the relationship between two objective measures of well-being (wealth and health) and altruism (N=130). Moreover, these indirect effects increase as individualist values increase within the subset of countries (N=90) with available data. Together, results indicate that altruism increases when resources and cultural values provide objective and subjective means for pursuing personally meaningful goals, and that altruistic behaviors may be enhanced by societal changes that promote well-being.

Keywords: altruism, prosocial behavior, subjective well-being, individualism

Significance Statement

We report the first evidence that seven objectively and subjectively measured altruistic behaviors compiled from five distinct sources across 48-152 nations reflect a single latent construct that is positively associated with national-level well-being and individualist cultural values. Consistent with prior work in the United States, we find that global-scale variation in subjective well-being partially mediates the relationship between two measures of objective well-being (wealth and health) and altruism. Over and above this relationship, these identified partial indirect effects increase as individualist values within a country increase. Our work supports theoretical frameworks that position subjective well-being as a promotional factor for engaging in activities that are pursued for their own sake and contribute to further enhancements in well-being. These new insights suggest that when resources and cultural values provide the objective and subjective means for pursuing individual goals, among the goals people become more inclined to pursue is altruism.

Introduction

Altruistic behaviors are non-reciprocal acts aimed at improving others' welfare, and range from everyday behaviors like giving directions or donating to charity to costly, extraordinary acts like heroic rescues and living organ donations. Reliable individual- and situational-level predictors of altruism have been identified and position individual variation in altruism within well-known frameworks of socio-affective motivation and behavior—including sensitivity to others' distress and salience of need (Marsh et al., 2014; Slovic et al., 2017). But less is known about what may be the most consequential source of variation in altruism: its non-uniform geographic distribution. For example, impressive cross-national variation in altruism emerges in the Charities Aid Foundation's (CAF) annual World Giving Index. This assessment of global volunteering, charitable giving, and everyday helping has been compiled annually since 2010 and finds altruism to be up to four times more prevalent in the most- versus least-charitable nations. These findings suggest that stable social and cultural variables likely contribute to variation in multiple forms of altruism, a possibility also supported by previous investigations of smaller geographic regions (Bach et al., 2017; Brethel-Haurwitz & Marsh, 2014).

The variable most consistently associated with altruism at both the individual and geographical level is subjective well-being (SWB; Aknin et al., 2012, 2019; Curry et al., 2018; Dunn et al., 2008). Increases in objective indices of well-being (e.g., economic resources, health, education) promote positive subjective states, which in turn promote engagement in intrinsically meaningful behaviors (Jayawickreme et al., 2012) including those that improve the well-being of others. Decades of experimental research draw conclusive bidirectional links between a variety of altruistic behaviors and SWB. Increases in charitable giving, everyday helping, and donating blood reliably lead to increased SWB (Aknin et al., 2012, 2018; Dunn et al., 2008; Jebb et al.,

2020; Layous et al., 2017). And increased SWB in turn leads to increases in various forms of altruism at both individual and geographic levels. For example, individuals who report higher well-being invest more hours in volunteer service (Thoits & Hewitt, 2001), spend more money on others (Aknin et al., 2012), and exert greater effort for others (Layous et al., 2017). Recent work within in the United States has also linked geographical variation in SWB to increases in altruistic kidney donation (Brethel-Haurwitz & Marsh, 2014). What this work cumulatively suggests—but no systematic effort has yet demonstrated—is that altruistic behaviors reflect manifestations of a latent construct, the geographic prevalence of which can be reliably predicted from global-scale variation in SWB.

The relationship between SWB and altruism is likely shaped by a variety of factors, including cultural values (Diener et al., 1995; Diener & Tay, 2015; Smith et al., 2013). For example, individualist cultural values reliably predict increased national-level SWB (Diener et al., 1995; Steel et al., 2018). In individualist cultures, the individual is viewed as the fundamental unit of society, and autonomy and personal choice are valued relatively more than the needs and concerns of the group (Hofstede et al., 2010; Triandis, 1995). Individualism thus promotes the pursuit of personally valued goals and self-expression, such as selecting a profession or romantic partner in accordance with one's values rather than to promote community harmony. These emergent properties are putatively why individualism is consistently related to SWB, as variables enhance SWB when they improve the ability to pursue and achieve meaningful goals (Diener et al., 1995). To the extent that altruism may represent a personally meaningful outcome promoted by SWB, individualism may also be positively associated with geographic variation in altruism. Moreover, given differences in interpretations and manifestations of SWB across cultures that

vary in individualism-collectivism (Steel et al., 2018), individualism may also moderate the relationship between SWB and altruism.

To investigate these questions, we identified and compiled publicly available data about seven forms of subjectively and objectively measured altruism drawn from five distinct sources and which ranged from extraordinary (living organ donation) to everyday (helping a stranger) behaviors. We then assessed associations between global-scale geographical variation in altruism and SWB, as well as relevant demographic and cultural factors. We predicted SWB would be positively associated with geographical variation in altruism, even controlling for key sociodemographic covariates, cultural values, and shared history. We also predicted that, as observed within the United States (Brethel-Haurwitz & Marsh, 2014), increased SWB would mediate the relationships between indices of objective well-being (e.g., wealth and health) and geographic variation in altruism. Finally, we investigated how cultural values, such as individualism, shape these effects.

Method

Data collection and selection

We conducted a search for datasets relevant to altruistic behavior at the national level (e.g., data from the entire population of multiple countries, or from representative samples of the populations of those countries). We ultimately identified and obtained large cross-national datasets indexing seven forms of altruism. These included charitable donations, volunteering, and everyday helping as indexed by responses to three questions from the Charities Aid Foundation (Supplemental Table S2): Have you done any of the following in the past month: Donated money to a charity? Volunteered your time to an organization? Helped a stranger, or someone you didn't know who needed help? Using these data, we calculated countries' (N=153)

2012-2016 mean score for each item to maximize measurement stability. We also compiled data for total annual blood donations per capita (2011-2013, N=136) from the World Health Organization (Supplemental Table S2), total annual living kidney donations per million of population (2016, N=68) from the Donation & Transplantation Institute (Supplemental Table S2), total bone marrow donor registry members per capita (2018, N=54) from the World Marrow Donor Association (Supplemental Table S2), and national-level assessments of the humane treatment of non-human animals (2014, N=48) from the World Animal Protection organization (Supplemental Table S2). Per capita blood and marrow donation rates were calculated using total population over 15 years of age from the World Factbook data compiled by the Central Intelligence Agency (Supplemental Table S2). All measures were standardized to exhibit a mean of 0 and a standard deviation of 1. Following exploratory factor analyses and analyses of reliability confirming convergence among these items, available scores for each nation (Median items=5) were averaged to create composite altruism scores.

Drawing from prior explorations (Bach et al., 2017; Brethel-Haurwitz & Marsh, 2014), we considered potential national-level covariates linked to altruism, including: wealth (log-transformed economic growth per capita; log GDP) and inequality (GINI coefficient), and percent adult literacy from the World Bank, average lifespan, median age, sex ratio, and population size from the World Factbook data compiled by the Central Intelligence Agency, and cultural diversity as indexed by Fearon (Supplemental Table S2). In bivariate correlation analyses, our composite altruism score was positively associated with five of these sociodemographic variables. These included proportion of males (sex ratio) and four variables that index features of objective well-being, including wealth (log GDP), health (average lifespan, median age), and education (literacy) ($\rho=.181-.477$, $P<.05-.00001$). Of these variables, log

GDP, average lifespan, median age, and literacy were all highly intercorrelated ($\rho=.68-.86$, $p<.0001$) (Table S1).

SWB comprises two distinct components: reflective judgements of life satisfaction, or subjective thriving, and reports about the emotional quality of everyday experience in terms of positive and negative emotions (Diener et al., 1995). Assessing both components is essential, as they have distinct correlates (e.g., income and education are more closely related to thriving, but chronic illness, loneliness, and smoking are more closely associated with daily emotional experiences; see Kahneman & Deaton, 2010). We compiled data collected by the Gallup World polling organization regarding both of these components of SWB (Supplemental Table S2): subjective thriving (N=134) and daily experience (N=135). Subjective thriving was measured via ratings of respondents' present and future lives (for the next five years) on a "ladder" scale with steps numbered from 0 to 10 ("0" indicating the worst possible life and "10" the best possible life; note this scale is distinct from the ladder scale used to measure social status). Daily experience was scored based on average responses (0-10) about daily emotional experience (e.g., feeling well-rested, being treated with respect, smiling/laughter, learning/interest, enjoyment, physical pain, worry, sadness, stress, anger) with higher scores representing better days. See Supplemental Table S2 for specific instructions and question wording.

Finally, we compiled data relevant to six cultural variables originally proposed and measured by Hofstede and colleagues (Supplemental Table S2): power distance (N=102), individualism (N=102), masculinity (N=102), uncertainty avoidance (N=102), long-term orientation (N=86), and indulgence (N=81). Missing values were not imputed due to the high percentage and non-random nature of these values. We also gathered data using the Ethnologue language family index to use as a proxy for shared cultural history (Supplemental Tables S2).

Data analysis

Using Stata 16, we next conducted nine statistical models to assess the associations among global-scale geographical variation in altruism and demographic, social, and cultural factors in consideration of the limited number of available observations due to missing data. To assess the effect of well-being on altruism (Models 1a-c), we incorporated observations from 130 countries into a simultaneous multiple linear regression with 5000 bootstrap resamples to estimate bias-corrected standard errors and 95% confidence intervals. This model tested the effects of objective well-being (log GDP, average lifespan, median age, literacy), sex ratio, the effect life satisfaction, and the effect of daily experience. We then tested the bivariate relationships between thriving and all seven forms of altruism using both Pearson and Spearman correlations.

Mediation analyses included observations across 130 countries to assess the indirect effects of objective measures of well-being on altruism through SWB (Model 2). We calculated the magnitude and significance of the indirect effect using the product of coefficients method with 5000 bootstrap resamples to estimate bias-corrected 95% confidence intervals.

To test the effect of SWB on altruism while accounting for cultural variables, we conducted a series of multiple regression analyses with 5000 bootstrap resamples to estimate bias-corrected standard errors and 95% confidence intervals. Our first model (Model 3a) incorporated observations from 75 countries with six cultural values as predictors controlling for log GDP, median age, average lifespan, sex ratio, and literacy. To account for covariation due to non-independent cultural histories across countries (Galton's problem), we identified language families with >7 countries in our dataset, yielding 4 language family groups among 57 countries (Semitic, Italic, Germanic, Balto-Slavic) and grouped all others among the remaining 18

countries. Language families were dummy coded and entered into the regression model to test mean differences in altruism between Semitic (N=8), Italic (N=17), Balto-Slavic (N=11), and all other families (N=18) relative to Germanic (N=21). We ran a regression model (Model 3b) to test whether the effect of individualism on altruism persisted after controlling for shared cultural history, log GDP, average lifespan, median age, sex ratio, and literacy. We next entered SWB (thriving) into our next regression model (Model 4a) accounting for six cultural values, log GDP, average lifespan, median age, literacy, and sex ratio across 75 countries, and then tested the interaction effect of SWB and individualism on altruism (Model 4b). We then examined this interaction effect in a larger sub-sample of 90 countries with available individualism and SWB data (Model 4c).

In our final set of tests, we first conducted another mediation analysis to confirm the indirect effects in a subsample of 90 countries with available individualism data (Model 5). Finally, we conducted a moderated mediation analysis to test whether the indirect effect of wealth on altruism through SWB would vary across levels of individualism (Model 6). Among 90 countries, we again estimated the magnitude and significance of the indirect effects at different levels of individualism using the product of coefficients method with 5000 bootstrap resamples to estimate bias-corrected 95% confidence intervals.

Results

Distinct outcomes or indices of a latent construct?

An exploratory factor analysis using a principal-axis factor extraction across the seven subjectively and objectively measured forms of altruistic behavior (charitable donations, volunteering, everyday helping, blood donations, living kidney donations, bone marrow donor registrations, and humane treatment of non-human animals) yielded a two-factor solution,

however, all variables loaded more strongly on the first factor, which explained 38% of all variance; all but one variable (marrow donation) yielded loadings >0.5 on this factor (range: 0.42-0.79). Scores across the seven indicators yielded a Cronbach's $\alpha=.785$, with an $ICC=.787$, $CI_{95}[0.63,0.89]$, $F(25,250)=4.68$, $P<.001$. Together, these outcomes support the conclusion that the seven forms of altruism are manifestations of a common latent construct. Mean scores using all available items for each country were therefore calculated (Median items=5). Composite scores were approximately normally distributed ($Z=-1.27-1.52$, $skewness=0.481$, $s.e.m.=.197$; $kurtosis=-.537$, $s.e.m.=.391$).

The global relationship between SWB and altruism

Following prior findings, we hypothesized that country-level indicators of objective well-being, particularly per-capita wealth, would be associated with country-level altruism, but SWB would explain geographic variance in altruism even when controlling for relevant sociodemographic variables (Brethel-Haurwitz & Marsh, 2014). Our first stepwise model (Model 1a; $N=130$) was a multiple linear regression incorporating wealth, median age, average lifespan, sex ratio, and literacy. In the first step assessing the relationship between indicators of objective well-being and altruism, $\chi^2(5)=50.35$, $P<.0001$, we found unique variance associated only with wealth persisted as a predictor of altruism ($b=.41$, $SE=.09$, $CI_{95\%}=[.24 .59]$, $P<.001$). In stepwise analyses, we next included the two indices of SWB: current and anticipated life satisfaction (subjective thriving) and daily life experiences. Inclusion of thriving into the model (Model 1b; $N=130$) significantly increased total variance explained, $R^2_{change}=.13$, $\chi^2(6)=94.07$, $P<.0001$. The association between SWB (subjective thriving) and altruism was robust ($b=1.65$, $SE=.28$, $CI_{95\%}=[1.13 2.23]$, $P<.0001$), whereas the association between wealth and altruism decreased but remained statistically significant ($b=.25$, $SE=.08$, $CI_{95\%}=[.09 .41]$, $P=.002$). Inclusion of our

second measure of well-being indexing daily life experiences did not increase variance explained by the model (Model 1c; $N=130$), $R^2_{change}=.0005$, and this measure was not related to altruism, $P=.79$, (Table 1). (Note that both linear and quadratic trends were also observed in the associations between wealth and both SWB and altruism. In both cases, the linear relationships were attenuated in wealthier countries; Supplementary Table S3; Figure S1ab).

Further supporting the robustness of the link between SWB and altruism, we considered the relationship between thriving and each of the seven individual indices of altruism separately. We assessed both bivariate parametric and non-parametric associations as well as the residual relationship after controlling for our five covariates (log GDP, average lifespan, median age, literacy, and sex ratio). Across the seven indices, we found associations between SWB and altruism to be generally robust and consistent (Figure 1). This is noteworthy given that these indices of altruism reflect both personal and institutional forms of giving, which prior findings suggest may be distinct subtypes of altruistic behavior (Enelamah & Thanh, 2019).

We next conducted a mediation analysis to assess the indirect effect of wealth on altruism through thriving at a global scale (Model 2; $N=130$). Our model revealed significant partial indirect effect of wealth (log GDP) on altruism through thriving (*indirect effect*=.16, $SE=.05$, $CI_{95\%}=[.08 .29]$, $P=.001$) as well as an indirect effect of health (average lifespan) on altruism through thriving (*indirect effect*=.01, $SE=.01$, $CI_{95\%}=[.01 .03]$, $P=.009$). Both wealth ($b=.10$, $SE=.02$, $CI_{95\%}=[.06 .15]$, $P<.0001$) and health ($b=.01$, $SE=.003$, $CI_{95\%}=[.003 .02]$, $P=.004$) were significant predictors of thriving, and thriving ($b=1.65$, $SE=.28$, $CI_{95\%}=[1.13 2.23]$, $P<.0001$) was highly predictive of altruism (Table 2). This result suggests first that the previously reported effect of SWB on altruism in the United States persists at an international scale, and expands this framework by indicating effects of two indices of objective well-being (wealth and health).

Third, it suggests that geographic variation in SWB statistically predicts not only extraordinary forms of altruism (non-directed living kidney donation), but multiple forms of altruistic behavior including all living kidney donations, blood and marrow donations, and the humane treatment of animals.

Cultural values that promote the relationship between SWB and altruism

Following robust evidence of the influence of cultural values on both SWB and altruism (Diener et al., 1995), we next considered relationships among SWB, altruism, and cultural values. Among countries with available data on cultural values, shared cultural history, and thriving, we evaluated whether the relationship between SWB and altruism would change after accounting for six overarching cultural values, shared cultural history, wealth, and key sociodemographic covariates in a series of regression analyses. In our first regression (Model 3a; $N=75$), we assessed the relationship between cultural values and altruism controlling for objective indices of well-being, $\chi^2(11)=172.62$, $P<.0001$. We found that individualism ($b=.009$, $SE=.003$, $CI_{95\%}=[.003 .02]$, $P=.008$) and indulgence ($b=.008$, $SE=.003$, $CI_{95\%}=[.002 .01]$, $P=.007$) were the only cultural values linked to altruism. (Given some inconsistencies in how individualism is conceptualized and measured, we also sought to confirm the individualism-altruism association using an independent 10-point individualism index (Diener et al., 1995) in countries with available data and found that this relationship persisted; Supplemental Table S3). Although these results offer evidence for a meaningful relationship between cultural values and altruism, this covariation may alternatively be explained by geographical autocorrelation due to the non-independent cultural histories shared across countries (Galton's problem). Following previous approaches, we used language family as a proxy for shared cultural history and entered this variable in our second regression (Model 3b; $N=75$), $\chi^2(15)=182.06$, $P<.0001$, $R^2_{change}=.06$.

We found significant differences in altruism among language families (dummy coded), $P_s < .05$. Importantly, we identified a persistent relationship between individualism and altruism ($b = .007$, $SE = .004$, $CI_{95\%} = [.0002 .02]$, $P = .05$) controlling for key country-level covariates, cultural values, and language family (Table 3). Notably, language family accounted for the variance in altruism explained by indulgence.

Our next model tested how accounting for cultural values and covariates may affect the relationship between SWB and altruism (Model 4a; $N = 75$), $\chi^2(12) = 166.98$, $P < .0001$. Among countries with available data, we again found a robust relationship between individualism and altruism ($b = .009$, $SE = .004$, $CI_{95\%} = [.002 .02]$, $P = .017$). However, our previously established significant relationship between SWB and altruism became non-significant ($b = .18$, $SE = .41$, $CI_{95\%} = [-.53 1.13]$, $P = .66$). Given this outcome, we considered whether the relationship between SWB and altruism may be moderated by individualism. Controlling for key covariates, our model testing moderation (Model 4b; $N = 75$), $\chi^2(13) = 237.29$, $P < .0001$, $R^2_{change} = .04$, revealed a significant interaction between SWB and individualism ($b = .038$, $SE = .013$, $CI_{95\%} = [.01 .06]$, $P = .003$), such that the positive relationship between SWB and altruism increased as individualistic values increased. Because data in this sub-sample were missing for several cultural variables, including language families, we confirmed this interaction effect in a larger sub-sample of countries (Model 4c; $N = 90$), $\chi^2(8) = 156.22$, $P < .0001$ (Table 4; Figure 2).

The observed interaction between SWB and individualism suggests that individualism may moderate the main effect of SWB on altruism as well as the mediating effect of national wealth on altruism through SWB. Thus, before proceeding, we examined whether the indirect effect of wealth on altruism through SWB persisted after listwise excluding 40 countries with missing cultural data (Model 5; $N = 90$). This mediation model revealed similar results, with an

indirect of wealth (log GDP) on altruism through SWB (*indirect effect*=.15, *SE*=.08, *CI*_{95%}=[.02 .33], *P*=.05) as well as an indirect effect of health (average lifespan) on altruism through SWB (*indirect effect*=.02, *SE*=.008, *CI*_{95%}=[.005 .04], *P*=.03). Wealth (*b*=0.09, *SE*=.05, *CI*_{95%}=[.01 .19], *P*=.04) and health (*b*=0.01, *SE*=.005, *CI*_{95%}=[.003 .02], *P*=.02) both remained significant predictors of thriving, and thriving remained a highly significant predictor of altruism (*b*=1.61, *SE*=.30, *CI*_{95%}=[1.07 2.23], *P*< 0.001) (Table 5). We thus tested whether the indirect effects of both wealth and health on altruism through SWB were moderated by national-levels of individualism (Model 6; *N*=90). This moderated mediation analysis found that these indirect effects were not present in countries with individualism scores below the global mean, but increased among countries at and above mean individualism (Tables 6-7).

We plot Z-scored geographical variations in altruism, SWB (thriving), individualism, average lifespan, and per capita GDP in Figure 3.

Discussion

We find the first evidence for strong geographic convergence among seven diverse forms of altruism—from everyday behaviors like volunteering to rarer forms of extraordinary altruism like living organ or marrow donation—supporting the contention that these behaviors reflect a common latent construct. Further, we find robust evidence for global-scale geographic covariation between SWB (thriving and life satisfaction) and all of these forms of altruism, consistent with evidence from the laboratory and smaller geographic regions (Aknin et al., 2019; Bach et al., 2017; Brethel-Haurwitz & Marsh, 2014; Helliwell et al., 2019). Although we found geographic variation in altruism to be strongly and positively associated with objective indices of well-being (wealth and health), altruism's association with SWB persisted even after accounting for these. The indirect effect of wealth on altruism through SWB previously observed in the

United States was also observed in this international sample, and was especially robust in countries that highly value individualism. Together, these findings suggest that when resources and cultural values provide the objective and subjective means for pursuing individual goals, among the goals people become more inclined to pursue is altruism.

The relationship between well-being and altruism

The present work replicates prior findings that geographic variation in both objective well-being and SWB positively predict altruistic behavior. It also extends previous research showing robust associations between life satisfaction and at least two forms of altruism (charitable giving and volunteering) (Aknin et al., 2019; Helliwell et al., 2019; Jenkinson et al., 2013). Relatively rare, costly, and objectively measured forms of altruism (blood, marrow, and organ donations), and even behaviors towards non-human animals, follow a similar pattern.

Well-being is a multidimensional construct that reflects both objectively measured indicators of flourishing and subjective assessments like mood and quality of life (Kahneman et al., 1999). Objective well-being typically reflects the satisfaction of basic human needs such as economic resources, good health, and education (Oswald & Wu, 2010). The relationship between wealth and altruism is somewhat controversial, with some studies linking individual-level wealth and social status to greater selfishness and reduced helpfulness (Piff et al., 2010). However, a pre-registered study did not replicate these findings (Stamos et al., 2019), consistent with findings from large, representative samples that higher status and wealth correspond to volunteering and civic engagement (Gittell & Tebaldi, 2006; Hughes & Luksetich, 2008; Korndörfer et al., 2015). We also provide evidence that national-level health (longevity) plays a critical role within this framework, supporting associations among health, SWB, and altruism

(Kumar et al., 2012; Post, 2005). Together, these findings offer reassurance that there may be no inherent conflict between doing well and doing good.

SWB indicators go beyond measures of objective well-being in capturing quality of life (Diener et al., 1995; Diener & Seligman, 2018). We found national-level SWB (reported thriving and life satisfaction) explained variation in altruism better than measures of daily affect, consistent with evidence that evaluations of life satisfaction are more robustly associated with objective well-being (e.g., income) than reports of daily emotion (Diener et al., 2010; Kahneman & Deaton, 2010). SWB generally follows exogenous, objective indices of well-being and in turn leads to voluntary, beneficent behaviors that are pursued for their own sake and further promote well-being (Jayawickreme et al., 2012). At the individual level, these include common altruistic behaviors like volunteering and charitable giving (Aknin et al., 2012; Dunn et al., 2008; Jayawickreme et al., 2012; Weinstein & Ryan, 2010), which promote the well-being of both altruists and beneficiaries (Curry et al., 2018; Weinstein & Ryan, 2010). This suggests a bidirectional relationship between SWB and altruism, comprising a positive feedback loop whereby increases in well-being lead to altruistic behaviors that in turn promote increases in well-being (Aknin et al., 2012, 2015). Although we did not directly test this mechanism, our findings are consistent with the possibility of such positive feedback loops on a global scale.

Individualism and personally-driven altruism

In our models, individualism was positively associated with both SWB and altruism, and moderated the relationship between them such that SWB was more strongly associated with altruism in nations that value individualism. To the extent a robust positive geographic relationship between individualism and altruism appears counterintuitive, it may reflect the common conflation of individualism with selfishness. However, present results together with

previous work (Steel et al., 2018) may resolve this apparent paradox, in that individualist cultural values are reliably associated with SWB (Diener et al., 1995), which promotes altruism. Individualist values also moderated the indirect effects between objective well-being and altruism. This may be related to altruism—along with other behaviors—reflecting personal choices instead of role and obligation in more individualist nations. Individualist values may follow a cultural de-emphasis on kin-based institutions (Schulz et al., 2018) and greater exposure to "globalized" attitudes (more parochial motivations abandoned in favor of cosmopolitan ones), which may promote altruism particularly toward strangers (Buchan et al., 2009). By contrast, collectivist cultures emphasize adherence to intensive kin-based institutional norms, which reward greater conformity, obedience, and in-group loyalty. Rather than selfishness per se, then, individualism may promote the pursuit of personally relevant goals that benefit the welfare of others with relatively less regard to social ties. Although this is reassuring, given rising individualist values globally (Santos et al., 2017), future research should consider potential costs of individualistic forms of altruism, which may not promote the formation or strengthening of specific relationships to the degree that more relationally-driven altruism does.

Limitations

Limitations of our findings include their necessarily correlational and cross-sectional nature. Longitudinal data on multiple forms of altruism were either unavailable or available only across time spans too short for meaningful cross-lagged analyses. In addition, complete data on cultural and altruistic indicators were not available for all nations. We chose to forgo imputation methods due to the non-random nature of missing data in our sample. Thus, it should be noted that our data only represent a subset of the world's 195 countries. While our primary analyses arguably involve an impressive fraction of the world's population, analyses that include cultural

data include fewer countries because we were limited by available data. Sample sizes like these can be influenced by outliers. However, we made several efforts to account for potential bias and outliers among included cases, including statistical approaches robust to bias (bootstrap resampling) and non-parametric analyses that are robust to outliers (Spearman rank correlations), which yielded results very similar to our parametric analyses.

Notably, national-level wealth exhibited a quadratic relationship with both SWB and altruism (Supplementary Table S3; Figure S1ab). These nonlinear relationships are important considerations in the contexts of our findings: neither SWB nor altruism continue rising linearly as nations approach extreme levels of wealth. Mechanisms underlying this nonlinear relationship should be explored in future work.

Conclusion

Increasingly, national and international organizations that promote economic development are expanding their priorities to include measures of both objective and subjective well-being (United Nations, 2015). Although SWB often follows increases in objective indices of well-being (e.g., wealth, health), these constructs are distinct in important ways. Our findings reinforce the importance of focusing specifically on SWB, which robustly and consistently predicts multiple forms of altruism across nations. Thus, not only does geographic variation in altruism reflect a coherent construct that varies across nations, but altruism is positively associated with both material and subjective thriving, as well as cultural values linked to thriving. This suggests not only that altruistic goals are intrinsically and globally valued, but that they can be promoted by factors that foster flourishing, including improved health, wealth, and education.

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Table 1. Regression table for model 1, assessing the relationships between SWB and altruism controlling for sociodemographic variables.

	Model 1a N=130 R ² = .315		Model 1b N=130 R ² = .444		Model 1c N=130 R ² = .445	
<i>Altruism</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>
Subjective thriving			1.652 (.277) ^{***}	[1.13, 2.23]	1.6 (.345) ^{***}	[.94, 2.29]
Daily experience					.025 (.093)	[-.16, .21]
Log GDP per capita	.411 (.088) ^{***}	[.24, .59]	.248 (.08) ^{**}	[.09, .41]	.247 (.082) ^{**}	[.09, .41]
Average lifespan	.0003 (.013)	[-.02, .03]	-.014 (.011)	[-.04, .01]	-.014 (.011)	[-.03, .01]
Median age	-.022 (.012)	[-.05, .001]	-.012 (.011)	[-.03, .01]	-.012 (.011)	[-.03, .01]
Literacy	-.048 (.365)	[-.84, .60]	.01 (.348)	[-.75, .65]	.011 (.351)	[-.77, .64]
Sex ratio (M:F)	.475 (1.117)	[-.06, 3.73]	.398 (.959)	[-.09, 3.08]	.404 (1.012)	[-.09, 3.15]

Note. Standard errors (SE) and confidence intervals (CI) are bias-corrected using 5000 bootstrap resamples; ^{***} p<.001, ^{**} p<.01, ^{*} p<.05

Table 2. Regression table for model 2 assessing the indirect effect of objective measures of well-being on altruism through SWB.

Model 2 N=130				
<i>Subjective Thriving</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>		
Log GDP per capita	.099 (.024) ^{***}	[.06, .15]		
Average lifespan	.009 (.003) ^{**}	[.003, .02]		
Median age	-.006 (.003)	[-.01, .001]		
Literacy	-.035 (.087)	[-.22, .13]		
Sex ratio (M:F)	.047 (.196)	[-.24, .57]		
<i>Altruism</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>	<i>indirect effect (SE)</i>	<i>bias-corrected 95% CI</i>
Subjective thriving	1.652 (.277) ^{***}	[1.13, 2.23]		
Log GDP per capita	.248 (.08) ^{**}	[.09, .41]	.163 (.051) ^{**}	[.08, .29]
Average lifespan	-.014 (.011)	[-.04, .01]	.014 (.006) ^{**}	[.01, .03]
Median age	-.012 (.011)	[-.03, .01]	-.01 (.006)	[-.02, .0004]
Literacy	.01 (.348)	[-.75, .65]	-.057 (.146)	[-.40, .20]
Sex ratio (M:F)	.398 (.959)	[-.09, 3.08]	.077 (.312)	[-.39, .95]

Note. Standard errors (SE) and confidence intervals (CI) are bias-corrected using 5000 bootstrap resamples; ^{***}p<.001, ^{**}p<.01, ^{*}p<.05

Table 3. Regression table for model 3 assessing the relationships between SWB, culture, and altruism controlling for sociodemographic variables.

	Model 3a N=75 R ² = .656		Model 3b N=75 R ² = .715	
<i>Altruism</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>
Cultural values				
Power distance	-.004 (.004)	[-.01, .003]	.00004 (.004)	[-.01, .01]
Individualism	.009 (.003)**	[.003, .02]	.007 (.004)*	[.0002, .02]
Masculinity	-.003 (.002)	[-.01, .002]	-.003 (.002)	[-.01, .001]
Uncertainty avoidance	-.003 (.003)	[-.01, .003]	.001 (.004)	[-.01, .01]
Long-term orientation	.002 (.003)	[-.005, .01]	-.001 (.003)	[-.01, .01]
Indulgence	.008 (.003)**	[.002, .01]	.003 (.003)	[-.003, .01]
Language family				
Semitic > Germanic			-.626 (.271)*	[-1.18, -.10]
Italic > Germanic			-.518 (.173)**	[-.87, -.19]
Balto-Slavic > Germanic			-.71 (.233)**	[-1.13, -.20]
Other > Germanic			-.435 (.179)*	[-.79, -.08]
Log GDP per capita	.172 (.163)	[-.15, .50]	.163 (.181)	[-.18, .54]
Average lifespan	-.003 (.016)	[-.03, .03]	.001 (.017)	[-.04, .03]
Median age	-.002 (.018)	[-.04, .03]	.004 (.019)	[-.03, .05]
Literacy	-.097 (.891)	[-1.9, 1.62]	.168 (.989)	[-1.6, 2.22]
Sex ratio (M:F)	3.294 (1.768)	[.02, 6.94]	3.068 (1.744)	[-.18, 6.85]

Note. Standard errors (SE) and confidence intervals (CI) are bias-corrected using 5000 bootstrap resamples; *** p<.001, ** p<.01, * p<.05

Table 4. Regression table for model 4 assessing the SWB x individualism interaction effect on altruism controlling for sociodemographic variables.

	Model 4a N=75 R ² = .656		Model 4b N=75 R ² = .696		Model 4c N=90 R ² = .567	
<i>Altruism</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>
Subjective thriving	.182 (.41)	[-.53, 1.13]	-.464 (.426)	[-1.29, .40]	.814 (.354)*	[.09, 1.49]
Cultural values						
Power distance	-.004 (.004)	[-.01, .004]	-.006 (.004)	[-.01, .002]		
Individualism	.009 (.004)*	[.002, .02]	.005 (.004)	[-.002, .01]	.006 (.003)	[-.0001, .01]
Masculinity	-.003 (.002)	[-.01, .002]	-.001 (.002)	[-.01, .004]		
Uncertainty avoidance	-.003 (.003)	[-.01, .003]	.00003 (.003)	[-.01, .01]		
Long-term orientation	.002 (.003)	[-.005, .01]	.002 (.003)	[-.004, .01]		
Indulgence	.007 (.004)*	[-.0004, .01]	.008 (.003)*	[.001, .01]		
Thriving x Individualism			.038 (.013)**	[.01, .06]	.035 (.011)**	[.01, .06]
Log GDP per capita	.177 (.165)	[-.15, .52]	.206 (.167)	[-.12, .53]	.221 (.112)*	[.01, .45]
Average lifespan	-.005 (.017)	[-.04, .03]	-.007 (.016)	[-.04, .03]	-.003 (.015)	[-.03, .03]
Median age	-.003 (.018)	[-.04, .03]	-.009 (.017)	[-.04, .03]	-.025 (.012)*	[-.05, -.003]
Literacy	-.086 (.902)	[-1.93, 1.66]	.366 (.843)	[-1.44, 1.94]	.004 (.751)	[-1.62, 1.32]
Sex ratio (M:F)	3.231 (1.803)	[-.14, 6.91]	2.564 (1.805)	[-.81, 6.27]	.582 (.644)	[-.56, 2.03]

Note. Standard errors (SE) and confidence intervals (CI) are bias-corrected using 5000 bootstrap resamples; *** p<.001, ** p<.01, * p<.05

Table 5. Regression table for model 5 assessing the indirect effects of wealth and health on altruism through SWB controlling for sociodemographic variables in sub-sample.

Model 5 N=90 (Mediation)				
<i>Subjective Thriving</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>		
Log GDP per capita	.094 (.046)*	[.01, .19]		
Average lifespan	.011 (.005)*	[.003, .02]		
Median age	-.007 (.004)	[-.02, .001]		
Literacy	.064 (.205)	[-.34, .48]		
Sex ratio (M:F)	.019 (.246)	[-.45, .69]		
<i>Altruism</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>	<i>indirect effect (SE)</i>	<i>bias-corrected 95% CI</i>
Subjective thriving	1.608 (.294)***	[1.07, 2.23]		
Log GDP per capita	.359 (.113)**	[.15, .59]	.151 (.08)*	[.02, .33]
Average lifespan	-.014 (.016)	[-.04, .02]	.017 (.008)*	[.005, .04]
Median age	-.011 (.012)	[-.03, .01]	-.012 (.007)	[-.03, .001]
Literacy	-1.08 (.796)	[-2.79, .33]	.103 (.335)	[-.55, .81]
Sex ratio (M:F)	.178 (.827)	[-.68, 2.31]	.03 (.39)	[-.73, 1.09]

Note. Standard errors (SE) and confidence intervals (CI) are bias-corrected using 5000 bootstrap resamples; *** p<.001, ** p<.01, * p<.05

Table 6. Regression table for model 6 assessing the indirect effects of wealth and health on altruism through SWB across varying levels of individualism controlling for sociodemographic variables.

Model 6 N=90 (Moderated Mediation)				
<i>Subjective Thriving</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>		
Log GDP per capita	.094 (.046)*	[.01, .19]		
Average lifespan	.011 (.005)*	[.003, .02]		
Median age	-.007 (.004)	[-.02, .001]		
Literacy	.064 (.205)	[-.34, .48]		
Sex ratio (M:F)	.019 (.246)	[-.45, .69]		
<i>Altruism</i>	<i>b (SE)</i>	<i>bias-corrected 95% CI</i>	<i>indirect effect (SE)</i>	<i>bias-corrected 95% CI</i>
Subjective thriving	.814 (.354)*	[.09, 1.49]		
Individualism	.006 (.003)	[-.0001, .01]		
Thriving x Individualism	.035 (.011)**	[.01, .06]		
Log GDP per capita	.221 (.112)*	[.01, .45]	.076 (.052) <i>conditional</i> ^	[.004, .22]
Average lifespan	-.003 (.015)	[-.03, .03]	.009 (.006) <i>conditional</i> ^	[.001, .02]
Median age	-.025 (.012)*	[-.05, -.003]	-.006 (.005)	[-.02, .0002]
Literacy	.004 (.751)	[-1.62, 1.32]	.052 (.185)	[-.24, .55]
Sex ratio (M:F)	.582 (.644)	[-.56, 2.03]	.015 (.209)	[-.33, .63]

Note. Standard errors (SE) and confidence intervals (CI) are bias-corrected using 5000 bootstrap resamples; ^See Table 7 for conditional indirect effects on altruism through subjective thriving;

***p<.001, **p<.01, *p<.05

Table 7. Indirect effects of wealth (log GDP) and health (average lifespan) on altruism through thriving across levels of individualism.

<i>Predictor</i>	<i>Levels of Individualism</i>	<i>Conditional indirect effect</i>	<i>Standard Error</i>	<i>bias-corrected 95% CI</i>
Log GDP per capita	Mean – 1 SD	.004	.056	[-.11, .12]
	Mean – .5 SD	.040	.050	[-.03, .18]
	Mean	.076*	.052	[.004, .22]
	Mean + .5 SD	.113*	.062	[.02, .27]
	Mean + 1 SD	.149*	.076	[.02, .33]
Average lifespan	Mean – 1 SD	.0005	.007	[-.01, .01]
	Mean – .5 SD	.005	.006	[-.005, .02]
	Mean	.009*	.006	[.001, .02]
	Mean + .5 SD	.013*	.006	[.003, .03]
	Mean + 1 SD	.017*	.008	[.004, .03]

Note. Standard errors (SE) and confidence intervals (CI) are bias-corrected using 5000 bootstrap resamples; * indicates bias-corrected 95% confidence intervals for indirect effect sizes excluding zero.

Figure 1. Associations of subjective well-being (x-axis) with altruistic variables (y-axis), pairwise excluding countries without both altruism and well-being data.

Figure 2. Marginal plot of subjective well-being x individualism interaction effect on altruism, controlling for log GDP, median age average lifespan, literacy, and sex ratio.

Figure 3a-e. Geographic distribution of average altruism, subjective thriving (well-being), individualism, average lifespan, and GDP (per capital). Gray color indicates missing data. All data are z-scored.

Individualism by Country

Average Lifespan by Country

GDP per Capita by Country