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Geographical Differences in Subjective Well-Being Predict Extraordinary Altruism

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Abstract

Altruistic kidney donation is a form of extraordinary altruism, the antecedents of which are poorly understood. Although well-being is known to increase the incidence of prosocial behaviors and there is significant geographical variation in both well-being and altruistic kidney donation in the United States, it is unknown whether geographical variation in well-being predicts the prevalence of this form of extraordinary altruism. We calculated per capita rates of altruistic kidney donation across the United States and found that an index of subjective well-being predicted altruistic donation, even after we controlled for relevant sociodemographic variables. This relationship persisted at the state level and at the larger geographic regional level. Consistent with hypotheses about the relationship between objective and subjective well-being, results showed that subjective well-being mediated the relationship between increases in objective well-being metrics, such as income, and altruism. These results suggest that extraordinary altruism may be promoted by societal factors that increase subjective well-being.

Keywords

well-being, social behavior, altruism, prosocial nondirected living kidney donation

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Altruistic kidney donation, or the donation of a kidney to a stranger, has been described as an act of “extraordinary altruism” (Munson, 2002). Altruistic kidney donors receive no payment except compensation for medical bills, undergo exhaustive medical and psychiatric testing, may experience severe postsurgical pain, and are often treated with skepticism or even derision for their decision to provide a stranger with one of their own internal organs (Henderson et al., 2003; Massey et al., 2010). But little is known about the antecedents of this form of extraordinary altruism. Few psychological studies have been conducted to assess the precursors of altruistic kidney donation, and most of these have employed retrospective self-report data in small samples (Boulware et al., 2005; Henderson et al., 2003; Lennerling, Fehrman-Ekholm, & Norden, 2008; Massey et al., 2010). These data may be insufficient for capturing antecedents of altruism, which is notoriously prone to self-report biases (Eisenberg, 1983). Living kidney donation in the United States is unevenly distributed at the regional level (Matas et al., 2013), which suggests the importance of regional variables. Subjective well-being may be one such variable;

well-being also shows strong regional variation and has been linked to common prosocial behaviors, such as volunteering and charitable giving (Thoits & Hewitt, 2001). We explored whether geographical variation in well-being predicts the prevalence of extraordinary altruism.

Records on all nondirected (altruistic) kidney donations in the United States since 1999 are maintained by the Organ Procurement and Transplantation Network, which is administered by the United Network for Organ Sharing under contract with the U.S. Department of Health and Human Services. In a nondirected donation, the donor volunteers a kidney to an unknown recipient. Such a donation represents an intentional, costly behavior aimed at benefiting an anonymous, nonkin other, which satisfies the most stringent definitions of altruism (Batson, 2010; Clavien & Chapuisat, 2013; de Waal, 2009).

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Altruistic kidney donations cannot be readily explained by other dominant self-serving explanations for altruistic behavior, including kin selection, reciprocity, or adherence to social norms (Batson, 2010; Massey et al., 2010). The rarity of these donations and their strongly counter-normative nature have raised many questions about their causes (Henderson et al., 2003).

Converging strands of evidence have suggested that well-being may promote altruistic kidney donation. Well-being is a broad construct that comprises objectively and subjectively assessed quality of life (Kahneman, Diener, & Schwarz, 2003). Objective well-being, which reflects objectively measured basic human needs (e.g., economic resources, access to clean water, and good health), affords individuals the opportunity to engage in activities that contribute to subjective well-being (Gabriel, Matthey, & Wascher, 2003; Oswald & Wu, 2010). Subjective well-being incorporates both eudemonic components, such as self-reported engagement, meaning, and purpose, and hedonic components, such as self-reported positive emotions and life satisfaction (Diener, 2012; Ryan & Deci, 2001). A recently proposed “engine” model of well-being incorporates these various elements of well-being and posits that objective indices of well-being represent input variables that promote subjective processes that, in turn, lead to voluntary, beneficent well-being outcomes and activities (Jayawickreme, Forgeard, & Seligman, 2012). *Well-being outcomes* are defined as outcomes that are pursued for their own sake, contribute to general well-being, and are characterized and measured independently of other outcomes. Under this model, positive changes in objective well-being would be anticipated to increase subjective well-being, which would lead to increases in well-being outcomes.

Altruistic kidney donation satisfies these three criteria for well-being outcomes. Donors consistently report the desire to help another person as their primary motivation for donating (Henderson et al., 2003; Lennerling, Forsberg, Meyer, & Nyberg, 2004; Massey et al., 2010). They also report high levels of well-being after donation (Lennerling et al., 2008; Massey et al., 2010); nearly without exception, donors self-report that donation positively affected their psychological well-being and that they would make the same decision to donate again (Massey et al., 2010). Finally, altruistic kidney donation is a concrete outcome that can be independently measured using statistics provided by the United Network for Organ Sharing (Matas et al., 2013). Together, these factors support the hypothesis that increases in well-being may promote altruistic donation.

Researchers have linked subjective well-being to less extreme prosocial behaviors at the individual level (spending money on others, volunteering) and at the community level (trusting others, cooperating with

others, supporting democracy; Aknin, Dunn, & Norton, 2011; Diener & Ryan, 2009; Krueger, Hicks, & McGue, 2001). However, these prosocial behaviors also meet a range of self-serving goals, such as adherence to perceived social norms and enhancement of reputation (Bednall & Bove, 2011; Bekkers & Wiepking, 2011). It remains unclear whether subjective well-being can also promote acts of unambiguous and lifesaving extraordinary altruism. This is what we sought to determine in our study.

One difficulty in identifying antecedents of altruistic kidney donation is that such donations are exceedingly rare; per capita rates of altruistic kidney donation are less than 1 in 10,000. This very low base rate renders individual-level assessments infeasible for capturing predictors of donation. This obstacle can be superseded by comparing regional measures that capture, in aggregate, associations at the individual level (Diener, Tay, & Oishi, 2013). A nationally representative regional assessment of subjective well-being in the United States recently became available: the Gallup-Healthways Well-Being Index (<http://www.well-beingindex.com/>). Gallup-Healthways has conducted nationwide sampling of well-being since 2008, thereby creating the most extensive collection of well-being data in the country. The index taps into more dimensions of well-being than does most past research (Diener & Seligman, 2004) and includes both experienced and evaluative well-being (i.e., self-reported well-being in the moment and retrospectively), which is a recommended approach, given the biases that affect each perspective (Kahneman & Riis, 2005).

Our aim in this study was to evaluate the relationship between this nationally representative index of well-being and per capita altruistic kidney donations across states to establish whether well-being promotes extraordinary altruism. We assessed the relationship between these variables while controlling for covariates, including median income, age, and physical health, which may be associated with both well-being and altruistic donation but which are not hypothesized to drive the association between the two.

Method

We obtained data relevant to our hypotheses using publicly available databases and previously published research. Variables included statistics on nondirected kidney donations between 1999 and 2010 (Organ Procurement and Transplantation Network, 2011) and statewide assessments of well-being (Gallup, 2012). We also accounted for variables that may be confounded with our primary variables of interest, including statewide demographic and economic information, indices of physical and mental health, and state characteristics of collectivism and religiosity.

Altruistic donations by state

Statistics on altruistic kidney donation were provided by the United Network for Organ Sharing and were based on Organ Procurement and Transplantation Network (2011) data as of June 19, 2011. These data included the state of residence for all nondirected kidney donors from January 1999 to June 2011. Between 1999 and 2010, the most recent year for which complete data were available, 955 altruistic donations were recorded. Donors' demographic information is presented in Table 1. All 955 donors' states of origin were included in further analyses except for Washington, D.C., and Puerto Rico, for which scores on the Gallup-Healthways Well-Being Index and other key variables were unavailable. Per capita donations for the period from 1999 to 2010 were also calculated for each state using the 2010 census data for the population 18 and older as the population base. (The minimum age for eligibility for altruistic living kidney donation is 18; in addition, the Gallup-Healthways Well-Being Index includes responses of adults 18 and older only.) Thus, overall per capita donation rates represent each state's total number of donors from 1999 to 2010 divided by that state's 2010 adult population. Per capita donation rates for 2010 represent the total number of donors for a state in 2010 divided by the state's adult population in 2010. We identified state-level correlates of total per capita donations by state as well as per capita donations for 2010 only.

Table 1. Demographics of Altruistic Living Kidney Donors in the United States (1999–2010)

Demographic variable	<i>n</i>	Percentage of donors
Sex		
Female	535	56.02
Male	420	43.98
Age (years)		
18–24	50	5.24
25–34	169	17.70
35–44	242	25.34
45–54	312	32.67
55–64	158	16.54
65+	24	2.51
Race/ethnicity		
White	878	91.94
Hispanic	24	2.51
Black	30	3.14
Asian	14	1.47
American Indian/Alaskan Native	3	0.31
Multiracial	6	0.63

Note: Data were drawn from the Organ Procurement and Transplantation Network (2011).

Indices of well-being by state

The Gallup-Healthways Well-Being Index, a component of Gallup Daily Tracking (Gallup, 2012), is a state-level measure of self-reported subjective well-being in the United States that comprises six components. The *life-satisfaction* component is based on the Cantril Ladder Scale (Cantril, 1965) and evaluates life satisfaction at the current moment of the survey and expected life satisfaction 5 years in the future. *Emotional health* includes the respondent's daily experience of smiling and laughter, worry, and other emotional variables. *Physical health* includes feeling well-rested and reported sick days. *Healthy behavior* includes exercise and eating a healthful diet. The *work-environment* component includes job satisfaction and the respondent's relationship with his or her supervisor. *Basic access* includes feeling safe and having enough money for basic needs. Gallup-Healthways surveys a minimum of 1,000 adults across the United States each day via both landlines and cell-phone lines; results of these surveys are then combined to create an annual index.

Covariates by state

Both well-being and altruistic donation may covary with sociodemographic variables that are not predicted to drive the well-being/altruism relationship, including age, sex, race, education, health status, and income (Boulware et al., 2005; Diener & Ryan, 2009). Our regression analyses therefore included as covariates each state's median age, male-to-female sex ratio, proportion of the population with a high school degree or higher, and proportion of White, non-Hispanic residents. Data on race, sex, and median age were obtained from the U.S. Census Bureau; we used intercensal estimates from 1999 (U.S. Census Bureau, 2000) and 2010 (U.S. Census Bureau, 2012) census data. We collected statistics on educational attainment for 2000 through the U.S. Census Bureau (2006) and for 2010 through the U.S. Census Bureau (2011a) via the American Community Survey. Race and sex were calculated for the proportion of the population aged 18 and older. Educational-attainment statistics were for adults aged 25 and older.

Economic variables included state-level median household income (U.S. Census Bureau, 2011b) and Gini coefficient, a measure of income inequality (Noss, 2011; U.S. Census Bureau, 2005). Because altruistic donors must also pass mental- and physical-health screenings, we included state averages for the number of days within the past 30 days that respondents reported poor physical or mental health through the Behavioral Risk Factor Surveillance System, a nationwide health survey conducted by the Centers for Disease Control and Prevention (United Health Foundation, 2013).

State-level indices of collectivism-individualism and religiosity were also examined because of suggested links between these variables and prosocial behavior (Henderson et al., 2003; Vandello & Cohen, 1999). The collectivism-individualism index was based on a national survey of individuals conducted from 1993 to 1996, in which states were ranked according to respondents' endorsement of individualist and collectivist behaviors (Vandello & Cohen, 1999). The religiosity index was based on a 2011 Gallup survey, also a component of Gallup Daily Tracking (Gallup, 2012), in which respondents were asked the extent to which religion was an important aspect of their lives and the frequency with which they attended religious services. On the basis of responses to these questions, each state's religiosity score was calculated as the percentage of respondents classified as "very religious."

Analysis strategy

Several strategies were used to examine the association between altruistic kidney donation and well-being at the state level. In addition to investigating bivariate correlations between altruistic donations and well-being, we used multiple linear regression and mediation analyses to identify potential contributions of sociodemographic, economic, health, and social influences, including state-level measures of collectivism and religiosity. The 50 states constituted the primary units of analysis. We also investigated associations at the regional level (i.e., the nine geographic regions of the United States as defined by the U.S. Census Bureau).

Results

State-level rates of altruistic kidney donation vary widely. Between 1999 and 2010, total donors per state ranged from 0 to 76, which translates to per capita donation rates ranging from 0 (Delaware, Mississippi) to 0.000029 (Utah; see Fig. 1). Scores from the 2010 Gallup-Healthways Well-Being Index ranged from 61.7 (West Virginia) to 71 (Hawaii; see Fig. 1).

We first examined the bivariate association between 2010 state-level well-being and per capita donation rates from 1999 to 2010 and found a positive association between well-being and per capita altruistic donation, $r(48) = .52, p < .001$ (see Fig. 2). To account for possible high-leverage outliers (in particular, Utah's donation rate was 4.55 *SD* above the mean), we also conducted a rank-order correlation, which yielded comparable results, $\rho(48) = .70, p < .001$. This pattern was also replicated when state-level data were collapsed into the nine broader geographic regions defined by the U.S. Census

Bureau, $r(7) = .83 (p = .005)$, $\rho(7) = .83 (p = .005)$. These results support the existence of a strong positive relationship between regional-level well-being and the prevalence of extraordinary altruism.

To control for the period during which the data were collected, we also conducted analyses using altruistic-donation data from 2010 only. Although this variable is inherently more unstable because it relies on a smaller sample, the pattern of observed results remained very similar, $r(48) = .42 (p = .003)$, $\rho(48) = .45 (p = .001)$. These correlations were again replicated for the nine broader geographic regions, $r(7) = .83 (p = .006)$, $\rho(7) = .83 (p = .005)$, which reaffirmed the strong positive relationship between regional well-being and altruism.

To control for confounding variables that may have biased the observed association between well-being and altruism, we next estimated a regression model predicting per capita altruistic-donation rates from 1999 to 2010 from subjective well-being, as measured by Gallup-Healthways, with the additional inclusion of the following covariates: median household income, Gini coefficient, percentage of non-Hispanic Whites, sex ratio, median age, educational attainment, and indices of poor mental and physical health. Even after we accounted for covariates, well-being remained a significant predictor of altruism, $\beta = 0.58, t(40) = 2.36, p = .023$ (see Table 2 for results).¹ Well-being also remained a significant predictor of per capita donation rates when 2011 religiosity was added as a covariate, $\beta = 0.59, t(39) = 2.36, p = .023$.

When we performed this regression using the same set of covariates collected in 1999 and 2000, well-being again predicted altruism, $\beta = 0.48, t(40) = 2.25, p = .030$ (see Table 3 for results). In this model, well-being remained a significant predictor of altruism when collectivism (collected between 1993 and 1996) was added as a covariate, $\beta = 0.42, t(39) = 2.16, p = .037$. Together, these findings suggest that the relationship between well-being and altruism is not a function of basic sociodemographic factors, including regional variation in religiosity or collectivism-individualism.

The engine model of well-being predicts that improvements in objective well-being result in subjective changes that promote well-being outcomes, such as altruism (Jayawickreme et al., 2012). This model suggests that subjective well-being mediates the relationship between objective well-being and altruism. To test this model, we examined how positive changes in objective measures of well-being, which are known to promote subjective well-being (Diener et al., 2013), influence altruistic donations. We considered positive changes in both median income and health status across states from 1999 to 2010.

After controlling for baseline (1999) median income, we found that increases in median income from 1999 to

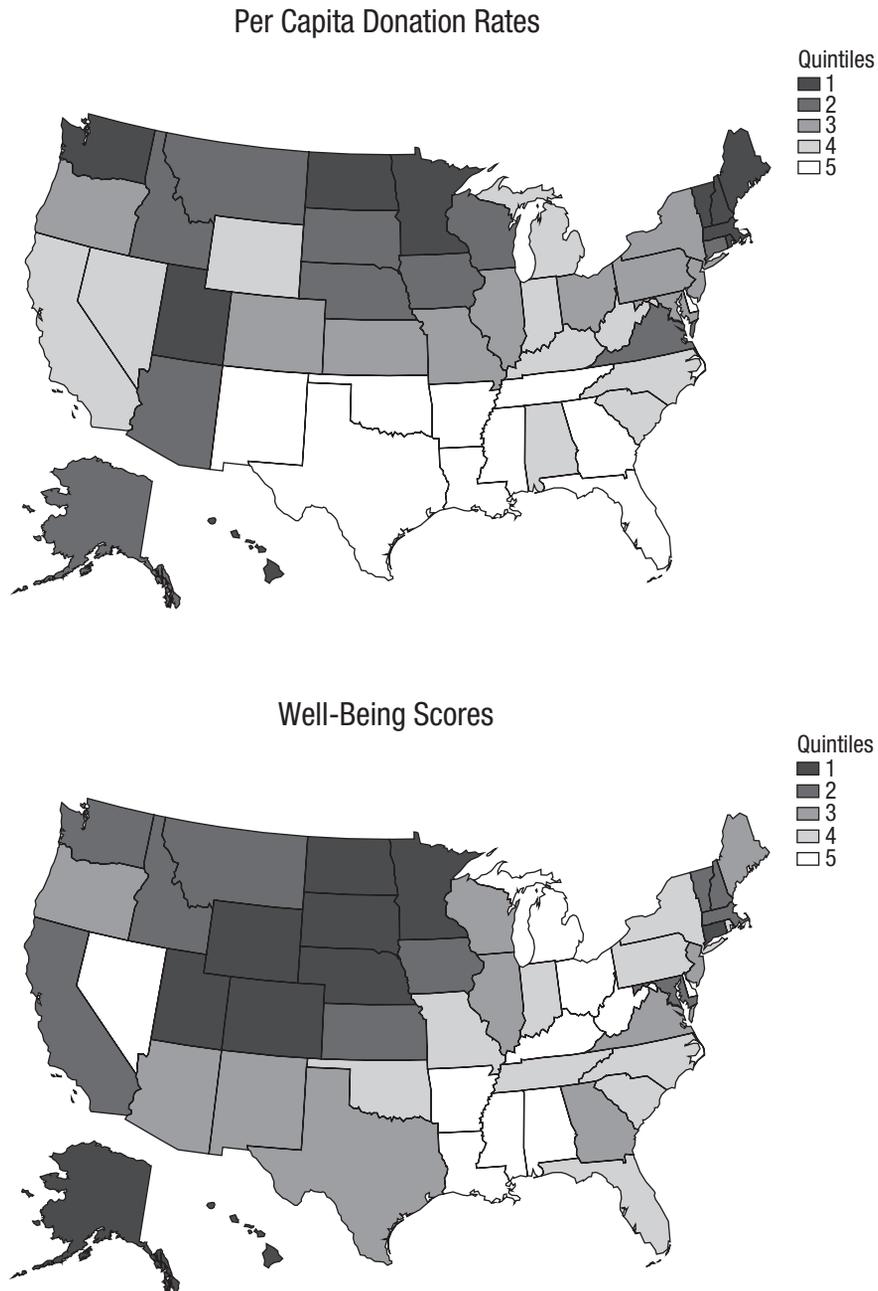


Fig. 1. Per capita altruistic living kidney donation rates (1999–2010) and 2010 Gallup-Healthways Well-Being Index scores across states. Data on kidney-donation rates were drawn from the Organ Procurement and Transplantation Network (2011); Well-Being Index scores were drawn from Gallup (2012). Quintile 1 represents the highest well-being/altruistic donation rates.

2010 predicted rates of altruistic donations during that time period, $\beta = 0.33$, $t(47) = 2.61$, $p = .012$. We estimated separate regressions with and without the inclusion of

our hypothesized mediator (well-being) and conducted a Sobel test; consistent with the engine model, results of the test showed that subjective well-being mediated the

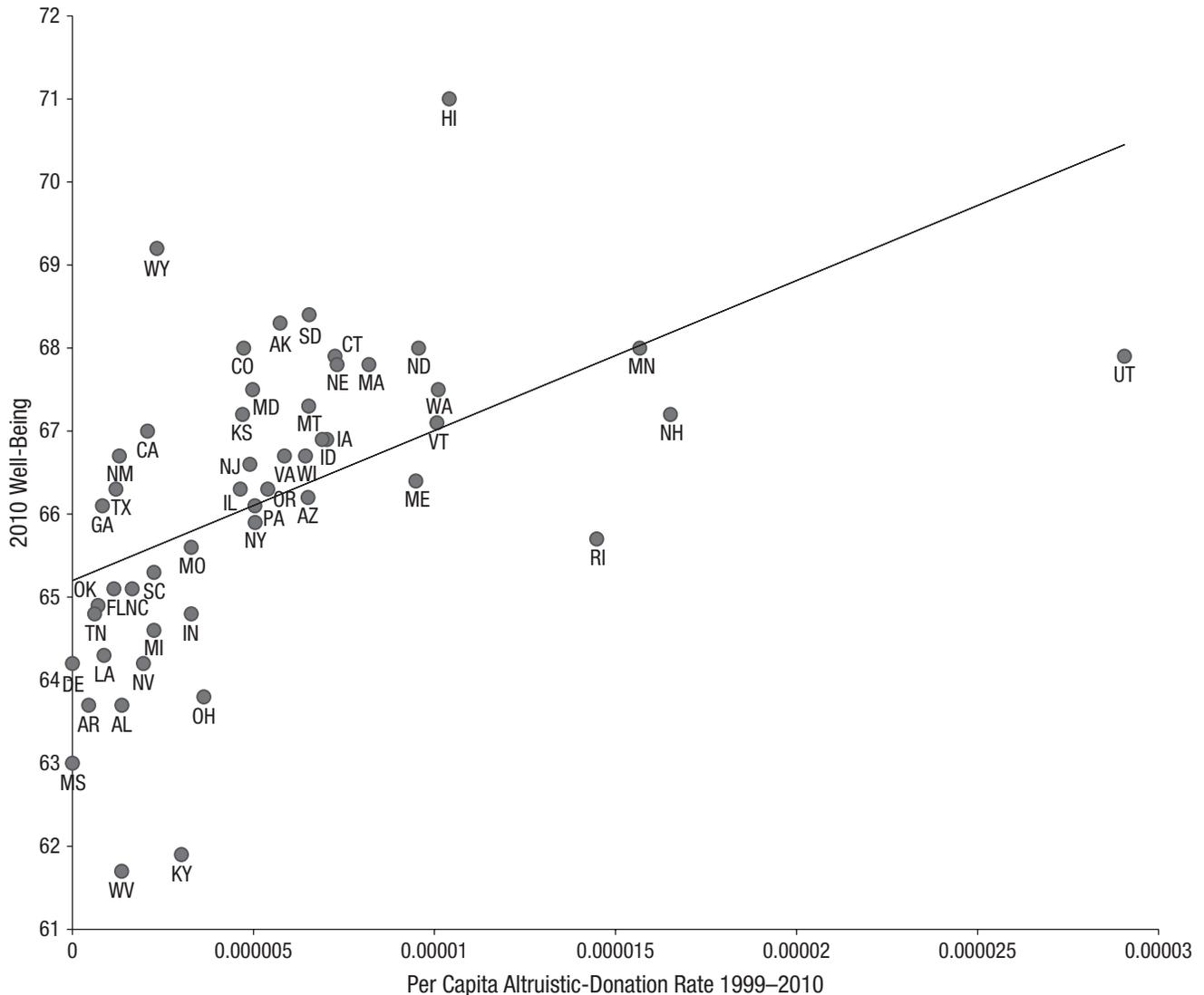


Fig. 2. Correlation of state-level per capita rates of altruistic living kidney donation (1999–2010) with state-level 2010 Gallup-Healthways Well-Being Index scores ($R^2 = .27$).

Table 2. 2010 State-Level Subjective Well-Being and 2010 Sociodemographic Covariates as Predictors of Altruistic Organ Donation Between 1999 and 2010

Predictor variable	β	$t(40)$
Well-being	0.58	2.36*
Gini coefficient ^a	-0.31	-1.65
Median income	0.40	2.63*
Percentage non-Hispanic White	0.42	2.54*
Male-to-female ratio	-0.38	-2.36*
Median age	-0.34	-2.47*
Educational attainment	-0.07	-0.23
Poor mental health	-0.01	-0.04
Poor physical health	0.30	1.19

Note: Overall model: $R^2 = .58$, $F(9, 40) = 6.22$, $p < .001$.

^aSmaller Gini coefficients represent more equal distribution of income.

* $p < .05$.

relationship between increases in income and altruism, $\beta = 0.19$, $t(46) = 1.35$ ($p = .184$), $z = 3.82$ ($p < .001$; see Fig. 3 for the mediation model).

We also found that increases in overall United Health Foundation health status, which includes both physical and mental-health components (United Health Foundation, 2013), predicted increased altruism from 1999 to 2010 after we controlled for baseline (1999) health status, $\beta = -0.28$, $t(47) = -2.39$, $p = .021$ (lower health-status scores indicate better overall health). However, subjective well-being did not mediate the relationship between improved health status and altruistic-donation rates, $z = -0.27$, $p = .79$.

Discussion

The reduction of annual deaths from kidney disease is a matter of national urgency. Kidney disease is among the

Table 3. 2010 State-Level Subjective Well-Being and 1999/2000 Sociodemographic Covariates as Predictors of Altruistic Organ Donation Between 1999 and 2010

Predictor variable	β	$t(40)$
Well-being	0.50	2.42*
Gini coefficient ^a	-0.20	-1.12
Median income	0.17	1.18
Percentage non-Hispanic White	0.36	2.10*
Male-to-female ratio	-0.29	-1.94
Median age	-0.40	-3.36***
Educational attainment	-0.05	-0.16
Poor mental health	0.00	0.00
Poor physical health	-0.06	-0.29

Note: Overall model: $R^2 = .59$, $F(9, 40) = 6.21$, $p < .001$.

^aSmaller Gini coefficients represent more equal distribution of income.

* $p < .05$. *** $p < .005$.

leading causes of death in the United States; more than 5,000 Americans die annually awaiting a kidney transplant (Matas et al., 2013). Increasing altruistic kidney donations has been posited as a viable solution to this serious and growing problem (Gilbert, Brigham, Batty, & Veatch, 2005; Henderson et al., 2003). If the nationwide rate of per capita altruistic donation matched that of the most altruistic state (Utah), it could yield more than 900 additional donations annually and as many lives saved. Although researchers have identified retrospective self-reported motives that affect individual donors' decision to donate, little is known about the antecedents of this form of extraordinary altruism.

We examined whether geographical differences in subjective well-being would predict the prevalence of altruistic kidney donation. We found that well-being

predicted altruistic donation and that this relationship persisted at both the state and the regional level for altruistic donations during a single year (2010) and over the course of a decade (1999–2010). Well-being accounted for more than 25% of the regional variance in altruistic-donation rates across the United States. Results showed that the altruism/well-being relationship persisted even after we accounted for objective state-level differences in income, income inequality, education, and physical and mental health; these data reinforce the finding that it is specifically subjective well-being that promotes extraordinary altruism. The discovery that subjective well-being drives this effect was reinforced by the finding that positive changes in regional income and health status predicted altruistic donation after we controlled for baseline income and health status, respectively; positive changes in objective well-being are strong predictors of subjective well-being (Diener et al., 2013). Indeed, subjective well-being mediated the relationship between positive changes in income and altruistic-donation rates. Together, these data suggest that improvements in objective well-being may in some cases result in improved subjective well-being that promotes extraordinary altruism.

The extreme rarity of altruistic kidney donation renders the inverse causal pathway—that altruistic kidney donations increase regional well-being—unlikely. It is more plausible that both well-being and altruistic donation are influenced by external covariates. One obvious possibility is that sociodemographic factors that impede donation among those individuals who are otherwise interested—such as poor health or poverty—drive changes in both well-being and altruistic donation. We addressed this possibility in our analyses by including these covariates in regression models. That accounting

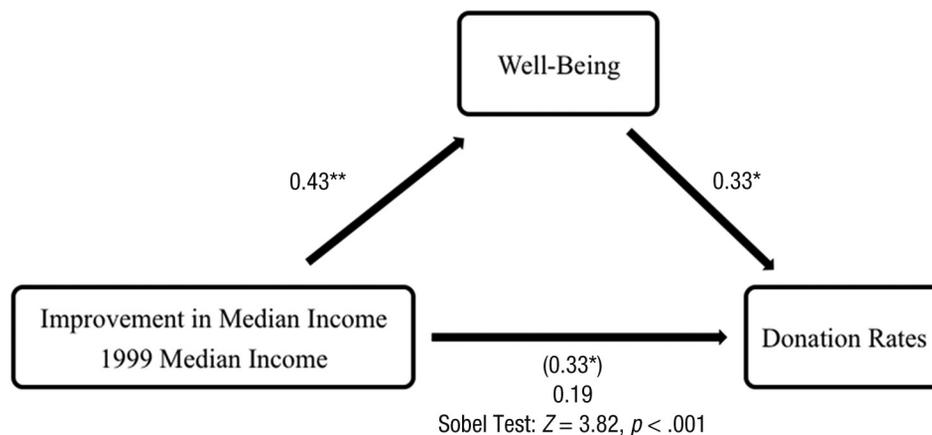


Fig. 3. Mediation model showing the effect of improvement in median income on total donation rates as mediated by subjective well-being. Values are beta coefficients. For the association between improvement in median income and total donation rates, the beta coefficient in parentheses represents the total effect of improvement on donation rates, whereas the second beta coefficient represents the indirect effect of improvement on donation rates, after we accounted for well-being as a mediator. Asterisks indicate significant paths (* $p < .05$, ** $p < .01$).

for these variables did not eliminate the well-being/altruism relationship supports the direct relationship between altruistic donation and subjective well-being.

A substantial literature has confirmed both that prosocial behaviors increase well-being (Aknin, Sandstrom, Dunn, & Norton, 2011; Dunn, Aknin, & Norton, 2008; Lyubomirsky, Sheldon, & Schkade, 2005) and that well-being increases prosociality (Aknin, Dunn, & Norton, 2011; Thoits & Hewitt, 2001). However, these findings have not demonstrated that well-being increases altruism, which represents a subset of prosocial acts that are aimed at assisting a needy, vulnerable other at a cost to the self (Preston, 2013). Common prosocial behaviors, such as volunteering, result from a variety of processes, including adherence to social norms or anticipated reciprocity (Bednall & Bove, 2011; Bekkers & Wiepking, 2011). But these mechanisms do not provide an adequate explanation for altruistic kidney donation, which is a high-cost, nonnormative, unreciprocated altruistic behavior. The present findings therefore expand the scope of the existing literature on the link between well-being and prosociality by suggesting that improved well-being may in some cases increase genuine altruism. Conversely, the finding that altruistic kidney donation can be understood within this framework may illuminate the origins of this consequential behavior and other related acts of altruism. Additionally, because our results were derived using a nationally representative sample, we avoided perennial concerns about unusual features of prosocial behavior that may be observed only in samples of undergraduate students or online participants.

That community-level wealth positively predicts altruism is of particular interest, given previous findings that some forms of prosocial behavior are inversely related to wealth. For example, subjective and objective estimates of social class and wealth negatively predict generosity in economic games and beliefs about donating to charity (Piff, Kraus, Cote, Cheng, & Keltner, 2010). Thus, our finding paradoxically indicates that community-level income may positively predict prosociality even while individual-level wealth does not. This result may relate to the fact that wealth at the individual level affects prosociality in part via social comparisons. Thus, within a community, wealthier individuals may be less prosocial even as the community as a whole becomes more prosocial as wealth increases. This is an important distinction because it suggests that increases in community-level objective well-being may result in overall positive, rather than negative, downstream effects on prosociality.

A limitation of these findings is that the recency of the Gallup-Healthways Well-Being Index prevents prospective analyses of altruistic kidney donation during the past decade. This issue is mitigated, however, by the stability

of geographic variation in well-being and altruistic donation in the United States from year to year, as demonstrated by the similar relationships found between well-being and altruism in assessed donations in 2010 and from 1999 to 2010. In addition, the finding that changes in median income from 1999 to 2010 predicted altruistic kidney donation, and that this effect was mediated by well-being, supports subjective well-being as an antecedent of altruistic kidney donation. Researchers in future studies may be better able to capture longitudinal features of the well-being/altruism relationship using present-day well-being statistics and regional variation in the prevalence of later altruistic kidney donations. If available, updated measures of collectivism across states would also be important to consider, given that the time period of the measure used here (1993–1996) may somewhat limit conclusions that can be drawn about the role of collectivism.

Obviously, an accumulation of factors must contribute to the decision to donate a kidney altruistically. Previous studies have suggested that altruistic kidney donors may differ from nondonors in their general altruistic motivation, empathy, or relevant life experiences (Henderson et al., 2003; Massey et al., 2010). But other variables must also be at play. Between 11% and 54% of individuals polled reported that they would consider altruistic donation (Henderson et al., 2003), but the prevalence of actual donations remains much lower. This difference suggests the existence of additional variables that “nudge” potentially receptive individuals into actually donating. Our findings suggest that well-being may be one such variable. This observation is consistent with the conceptualization of well-being as an engine, whereby positive changes in objective well-being contribute to subjective processes that promote engagement in meaningful and autonomous behaviors, such as altruism (Jayawickreme et al., 2012), although we note as a caveat that the correlational data reported here cannot directly support causal relationships.

Recognition of the importance of actively promoting well-being on a national level is increasing (Diener & Seligman, 2004). British Prime Minister David Cameron recently proclaimed the improvement of societal well-being to be “the central political challenge of our times” (Stratton, 2010). The findings reported here point to a concrete benefit that may derive from policies that promote well-being: an increase in lifesaving acts of extraordinary altruism. Given that altruism itself promotes well-being (Aknin, Dunn, & Norton, 2011), policies that promote well-being may help to generate a virtuous circle whereby increases in well-being promote altruism that, in turn, increases well-being. Such a cycle holds the promise of creating a “sustainable happiness” (Aknin,

Dunn, & Norton, 2011) with broad benefits for altruists, their beneficiaries, and society at large.

Author Contributions

A. A. Marsh developed the study concept. Both authors contributed to the study design. K. M. Brethel-Haurwitz acquired and analyzed the data under the supervision of A. A. Marsh. K. M. Brethel-Haurwitz drafted the manuscript, and A. A. Marsh provided critical revisions. Both authors approved the final version of the manuscript for submission.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Note

1. We excluded Utah (an outlier in altruistic donations) and reran this regression to examine the possibility that variables unique to Utah, such as increased social capital resulting from shared religious affiliations, drove the well-being/altruism relationship. With Utah excluded, well-being became a stronger predictor of altruism, $\beta = 0.79$, $t(39) = 3.40$, $p = .002$, which suggests that although unusual dynamics in Utah may underlie the state's unusually high rate of altruistic donation, any such dynamics do not explain the nationwide well-being/altruism relationship.

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