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Toward an Index of Well-Being for the Fifty U.S. States

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Toward an index of well-being for the fifty U.S. states

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1. Introduction

The present study is an attempt to integrate multiple research streams into one. In particular, we review the multidisciplinary literature on well-being, and then derive an index of the construct for the fifty U.S. states. We show that state well-being is substantially related to general mental ability and its covariates. We then test whether well-being can predict other important outcomes at the state level. Finally, we offer parallels between the g nexus and a well-being nexus.

We selected the fifty U.S states as the unit of analysis because aggregate-level data are becoming increasingly important in psychology (see, e.g., Diener, 2000; Lynn, Harvey, & Nyborg, 2008; McDaniel, 2006; Reeve, 2009; see also Davenport & Remmers, 1950). For example, both Diener (2009) and Gottfredson (2004a) have argued that researchers should move beyond the individual, and test the impact of psychological constructs (well-being nationally, and g in epidemiology, respectively) on aggregate-level variables.

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Examining the well-being of U.S. states, specifically, is important for at least five reasons. First, geographic differences in well-being and their correlates represent important questions in applied psychology and public policy. State differences in well-being are potential drivers of regional differences in social, political, economic and psychological criteria that impact millions of people. Second, considerable objective data exist at the state level which can inform the development of a well-being measure and permit examination of nomonological relationships. Third, much of these data are collected periodically as part of federal and private programs. Thus, one could track trends in such data over time. Trends in the data can be used to evaluate the effectiveness of changes in public policy within states. Fourth, substantial between-state variability exists in the variables we examine. Such variability permits cross-sectional analyses of correlates (e.g., government effectiveness) that can help determine the causes of inter-state differences in well-being. Fifth, as shown below, well-being and g are intimately linked at the state level. No complete understanding of well-being (or g) can come without appeal to its affects and covariates at all levels of analysis. In particular, it appears that well-being represents a network of intercorrelated variables, much like the g nexus, described next.

1.1. The g nexus

General mental ability (*g*) is a ubiquitous predictor of success in life.

Across dozens of studies, *g* correlates consistently with important, real-world outcomes, including educational achievement (Gottfredson, 2004b, 2005); income and wealth (Lynn & Vanhanen, 2006); health (Batty, Deary, & Gottfredson, 2007; Reeve, 2009), longevity (Deary, 2008), job performance (Hunter, 1993; Schmidt & Hunter, 1998), and law-abidingness (Herrnstein & Murray, 1994).

The consistent finding that *g* is essential to predicting a variety of life outcomes has led researchers to propose the existence of a *g* nexus (Jensen, 1998; Nyborg, 2003). As identified by Jensen (1998), the *g* nexus is a network of inter-correlated variables with general mental ability at the center. It has both horizontal and vertical components. The horizontal component includes real-world variables which co-vary and interact with general mental ability. Examples include many of the variables cited above. The vertical component includes presumed causes of individual differences in *g*, with a special focus on biological and neuropsychological variables (i.e., individual differences in properties of the human brain).

Much recent work has focused on mapping the *g* nexus. McDaniel (2006), for example, has shown that state IQ correlates strongly with a global measure of state health and a separate measure of violent crime rates across states. Similarly, Reeve (2009) presented data on state IQ as a predictor of a variety of health measures, including infant mortality and fertility rates. Nyborg (2009) reported that religiosity is inversely related to *g*, using a large sample of white, adolescent Americans (see also see also, Bertsch & Pesta, 2009; Reeve, 2009). Finally, Lynn et al. (2008; see also Lynn, in press) documented the relationship between IQ and national poverty rates, income levels, and rates of atheism.

Many of the variables that correlate with *g* would likely also be indicators of well-being. In fact, well-being could be a central node in the nexus of inter-correlated variables that includes *g*. The overlap between the *g* nexus and a "well-being nexus" is implied by how psychologists have operationalized subjective well-being as a scientific construct.

1.2. The well-being nexus

Well-being has been a topic of interest to humanity since at least the sixth century B.C. (Steel, Schmidt, & Shultz, 2008). Within psychology, well-being generally lacks a fixed definition, although much research has focused on the construct of *subjective well-being* (e.g., Diener & Lucas, 1999; Steel et al., 2008). Subjective well-being is thought to be comprised of four dimensions: life satisfaction, happiness, affect, and quality of life (Steel et al., 2008).

Life satisfaction is typically based on an overall evaluation of one's life (Pavot, Diener, Colvin & Sandvik, 1991; Steel et al., 2008). Happiness refers to an optimistic outlook or mood that endures over time (Averill & More, 2000; Steel et al., 2008). When defined as affect, well-being shares close construct similarity with personality. When well-being is defined with respect to negative affect, it appears quite similar to the personality trait of neuroticism and when defined with respect to positive affect it appears quite similar to the personality trait of extraversion (Steel et al., 2008; Yik & Russell, 2001). Quality of life is usually a global measure that is a composite of well-being across multiple life areas (e.g., financial, health, social; Steel et al., 2008).

A second way to conceptualize well-being comes from the industrial/organizational psychology literature, and appeals to both physical and psychological health (see Warr, 1987, 2007 for a comprehensive discussion). Physical health refers to factors like the absence of disease, one's level of physical fitness, or whether one's basic needs (e.g., food, shelter) are met. Psychological health comprises five facets: affective well-being (similar to affect as a component of subjective well-being above), competence (having the intellectual ability needed to deal with life demands), autonomy (the ability to resist environmental influences), aspiration (motivation to establish and work toward meeting goals), and integrated functioning (the ability to balance different life demands).

In either case, the list of variables comprising measures of well-being seems to overlap considerably with the list of variables correlated with *g*. With this in mind, we attempted to identify state-level variables that would capture–at least in a preliminary measure–global, state well-being. In particular, we identify and review literature on various "sub-domains" of well-being, including intelligence, religiosity, crime, education, health and income. State-level data on these variables are readily available from the U.S. census and other private sources. We do not, however, claim that our sub-domains completely measure well-being, or map one to one with all of its facets. Instead, we selected the sub-domains because they are logically consistent with both psychological conceptions of subjective well-being reviewed above, and because reliable, state-level data already exist on many variables that theoretically fit in each sub-domain.

1.3. Sub-domains of well-being at the state level

Cognitive ability is an obvious candidate for inclusion as a sub-domain of well-being. The variables that *g* correlates with are featured prominently in most discussions of well-being (especially with regard to quality of life variables, and competence—see, e.g., Gottfredson, 2004c). Physical health is likewise critical to well-being, as it plays a central role in Warr's (1987) conceptualization of the construct.

Religiosity is often mentioned as a component of subjective well-being (Aghili & Kumar, 2008; Ellison & Levin, 1998; Heaven & Ciarrochi, 2007; Joshi, Kumari, & Jain, 2008). This is especially true in the area of health psychology (Hill & Pargament, 2008; McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000; Reeve, 2009). For example, people who attend church regularly may have longer life expectancies (Powell, Shahabi, & Thoresen, 2003). Park (2007) argued that religion improves health by increasing a person's level of social support and sense of self-meaning, and by offering prohibitions against certain unhealthy behaviors such as drinking or smoking. Hence, religion might contribute to well-being by helping people avoid harmful behaviors, and by offering a source of support and community to fall back on in times of need.

Not all studies show positive relationships between religiosity and health. Recently, Reeve (2009) reported aggregate

data from nearly 200 countries around the world. He found that religiosity (operationalized as the percentage of people within a country who report belief in a god) predicted greater infant and maternal mortality rates, deaths from HIV/AIDS, and lower life expectancies.

Further complicating the issue is that high levels of *g* have been linked to lower levels of religiosity, both at the national (Lynn et al., 2008; Reeve, 2009) and individual levels (Bertsch & Pesta, 2009). One possibility is that religiosity is inversely related to competence (i.e., one of the five facets of psychological health). Competence includes holding beliefs and world views that accurately reflect reality (Warr, 1987). Adopting irrational or mystical belief systems could partly result from lacking the information-processing capacity needed to think critically (see, e.g., Bertsch & Pesta, 2009).[1] At any rate, inclusion of religiosity as a well-being sub-domain, either because it creates happiness and social support systems for many people, or because it predicts deficits in competence, justifies its inclusion in an index of well-being.

Subjective well-being in terms of happiness, quality of life, and perhaps physical health would be affected by crime rates in the area where one lives. The relationship between crime and *g* is also well-established (see, e.g., Herrnstein & Murray, 1994). Likewise competence, life satisfaction and quality of life would all be impacted by one's level of education. We therefore included measures of crime and education as sub-domains of global, state well-being.

The final sub-domain we identified is economic well-being. At a macro level, economists often consider well-being as synonymous with personal or household income (U.S. Census Bureau, 2008a). Positive correlations between national wealth and subjective well-being have been reported (Diener & Biswas-Diener, 2002), and the link between *g* and income is well documented (see Lynn, in press, for a recent example).

1.4. Measuring and analyzing state well-being

Our general strategy was to compile multiple indicators for each of our six sub-domains of well-being (i.e., *g*, health, religion, crime, education, and income levels). We coded data primarily from the Statistical Abstract of the U.S. Census (2008b). Other private sources also were included in the data coding process (e.g., The Pew Foundation; The United Health Fund). We subjected the variables to principal components analyses (PCAs). Of key interest was whether the sub-domains represented independent "facets" of well-being, or whether they contributed to a single, global component (much like specific cognitive abilities factor into a single, global measure of intelligence; e.g., Jensen, 1998). In sum, we wanted to see whether well-being has a "bottom line" — a single number that accurately captures a large proportion of variance across its diverse sub-domains.

After creating the well-being index, we then explored whether it correlated with other important state-level outcomes and/or demographic variables. We picked the variables here not based on any particular theory, but instead to establish whether the well-being index possessed criterion validity. Of primary interest were (1) political variables (e.g., the percentage of people within a state voting for Barack Obama in the 2008 election; see e.g., Deary, Batty, & Gale, 2008; Rinderman, 2008, for aggregate-level data on political variables), (2) religious affiliations (e.g., the percentage of Catholics within a state), (3) attitudes on gay marriage bans (e.g., whether a state has amended its constitution to ban gay marriage), and (4) miscellaneous state-level variables that did not logically fit with any of our well-being sub-domains (e.g., traffic fatalities within a state).

2. Method

2.1. Sample and scale construction

The unit of analysis was the U.S. state, yielding a sample size of 50. Although all states were included in our index, the small sample size limited the methods available for data analysis. To build scales, we conducted principal component analysis (PCA) separately for the variables in each postulated sub-domain of well-being (except for state IQ, which was a single measure established by McDaniel, 2006). Based on the above review, our well-being composites fell in the following sub-domains: intelligence, religious belief, crime rates, educational achievement, state health, and state income. A hierarchical PCA was then conducted on the well-being sub-domains (including state IQ) to determine whether state well-being could best be described by a single general component or whether well-being is more suitably explained by a set of multiple components.

2.2. Measures

2.2.1. State IQ

State IQ was drawn from McDaniel (2006).

2.2.2. Religiosity

To form a state religiosity composite, we obtained data from the Pew Forum on Religion and Public Life (2008). Seven items were available to assess religiosity across states: (1) "I am certain God exists," (2) "Religion is very important to me," (3) "I attend church at least once per week," (4) "I pray daily," (5) "My prayers are answered at least monthly," (6) "My holy book is literally true," and (7) "Mine is the one true faith." Responses represented the percentage of survey respondents in each state who agreed with each statement.

2.2.3. Crime-rate data

To form a state crime-rate composite, data on burglary, murder and rape rates, as well as the number of inmates per state, were obtained from the 2008, *Statistical Abstract* of the U.S. Census (2008b). These variables were expressed as counts per 100,000 of the population within a state. We also obtained the violent crime rate per 1000 residents available from McDaniel (2006).

2.2.4. Educational achievement

The educational-achievement composite was formed by obtaining the percentage of each state's residents with a bachelor's degree, and the percent of the state workforce with

[1] We thank a reviewer for this idea.

science and engineering jobs. These data also came from the *Statistical Abstract* of the U.S. Census (2008b).

2.2.5. State health

The health composite was comprised of the following variables: the percentage of births to unwed mothers, the percentage of births to teenage mothers, and infant mortality rates (per 1000 births). These three variables came from the U.S. Census Bureau (2008b). The health composite also included a global measure of state health taken from the United Health Foundation (2008). This measure is an index comprising a battery of health-related variables. Examples include smoking, obesity, and health insurance coverage.

2.2.6. Income

To form a state income composite, we obtained data from the U.S. Census Bureau (2008b). Variables included: income per capita, disposable income per capita, percent of families in poverty, and percent of individuals in poverty.

2.2.7. Additional measures

The six sub-domains described above were entered into a hierarchical PCA to create a global index of state well-being. Thereafter, we obtained data on several other variables to explore the presence or absence of a nomonological network of well-being. These additional variables were either demographic in nature (e.g., the percentage of Catholics, Protestant or Godless people [i.e., report no belief in God] in each state), or themselves represented important outcomes (e.g., teacher salaries; traffic fatalities). The latter variables did not logically fit with our sub-domains (e.g., traffic fatalities) or did not load on them (e.g., teacher salaries failed to load on the education factor). The additional variables, however, served as tests of whether the global well-being index could itself predict other important state-level outcomes.

Five of these variables came from the U.S. Census, including: (1) the number of physicians per capita, (2) the number of driving fatalities per capita, (3) gross state product per capita, (4) median teacher salaries (kindergarten through twelfth grade), and (5) minimum wage. The percentage of residents in each state voting for Barack Obama in the 2008 presidential election was obtained from the Federal Register (2008). In addition, we coded the percentage of residents in each state who are Catholic, Protestant, or Godless. These data came from the Pew Foundation (2008) survey, and no other religious group had large enough representations within states to be included in the analyses.

We also coded the following two variables from the political polling website Fivethirtyeight (2008): the percentage of gun owners in each state, and the ratio of Starbuck stores to Walmart stores within a state. These two variables were regularly used by pollsters in the 2008 presidential election, as they are thought to roughly index a dimension of liberalism/conservatism for residents within a state.

Two final variables were included in these analyses. As of the end of the 2008 elections, 30 states have now amended their constitutions to ban gay marriage whereas 20 have not (National Conference of State Legislatures, 2009). Whether gay marriage should be legal is an obviously contentious issue. Arguments for and against, however, are often framed around the construct of well-being, at least indirectly. Denying people who are gay the right to marry would have obvious effects on components of their subjective well-being, including happiness, satisfaction and quality of life. Conversely, opponents of gay marriage often appeal to the putative negative effects that gay marriage may have on both family and societal well-being (see, e.g., Family Research Council, 2001, 2002). Hence, we explored whether constitutional bans of gay marriage correlate with our index of well-being at the state level. As an additional measure in this domain, we included the percentage of same-sex households within a state from Fivethirtyeight (2008).

3. Results

Table 1 shows the results of five PCAs for the diverse sub-domains of state well-being; namely, religion, crime, educational achievement, health, and income. The sixth sub-domain was state IQ (a single measure). For each sub-domain, only one principal component emerged with an Eigen value greater than one. The percentage of variance accounted for by these principal components ranged from 58% to 86%. The state IQ variable was drawn from McDaniel (2006) who did not report a PCA for the data used to create the composite. However, McDaniel did report an alpha reliability of .99 which indicated the substantial stability in state IQ data across years. For the five other sub-domains in Table 1, the lowest alpha reliability was .64 for educational

Table 1
Principal components analysis for the domains of state well-being, with variance accounted for in first principal component, alpha reliabilities and correlation matrix.

Well-being domain	% variance in 1st principal component	Correlation matrix						
		1	2	3	4	5	6	7
1. Religiosity	86	(.97)						
2. Crime	58	.51	(.72)					
3. Education	73	−.62	−.26	(.64)				
4. Health	79	−.68	−.82	.61	(.93)			
5. Income	85	−.72	−.42	.66	.63	(.94)		
6. State IQ[a]	–	−.55	−.76	.41	.75	.57	(.99)	
7. Global well-being[b]	67	−.83	−.78	.72	.92	.81	.83	(.90)

[a] State IQ was a single measure and so was not subjected to PCA. McDaniel (2006), however, reports an alpha reliability of .99 for this variable.
[b] This is the global measure of state well-being resulting from a hierarchical PCA on the six sub-domains that precede it. Note that religiosity and crime have negative loadings on global well-being.

achievement, and the alpha of the crime composite (.72) was the second lowest. The alpha reliabilities for the remaining three composites were in the .90s.

The bottom row of Table 1 shows the results of a hierarchical PCA conducted on the six sub-domains of well-being. A strong general component emerged from this analysis. It explained 67% of the variance in the six sub-domains, and no other principal component emerged with an Eigen value of greater than one. The alpha reliability of the global component was .90. As multiple components of well-being did not emerge, the global well-being index seems to be the most appropriate way of expressing state well-being based on our data.

Religious belief has a large magnitude negative loading on global state well-being, indicating that less religiously inclined individuals are residents of high well-being states. Though consistent with other aggregate-level data (see, e.g., Reeve, 2009), this pattern is inconsistent with results typically seen at the individual level. There, religiosity is often associated with subjective well-being and health-related well-being (see, e.g., Powell et al., 2003). As expected, crime was associated with negative state well-being but educational achievement, health, income and IQ were positively related to state well-being. State IQ, itself, loaded .83 on the global well-being composite.

Table 2 shows rankings and standard scores for the 50 U.S. states by global well-being, and by the six sub-domains. All measures were standardized with a mean of 100 and a standard deviation of 15. We also reverse-scored religiosity and crime such that higher well-being scores corresponded to less religiosity and lower crime rates within a state (i.e., we reverse scored these variables so that for all sub-domains in the table, higher scores corresponded to higher well-being). Colorado, for example, has a global well-being score of 113.0. Its religiosity well-being score is 114.5, indicating that Colorado is one of the least religious states in the country. The crime well-being score for Colorado (98.5) places it slightly above average in terms of crime rates relative to the other states.

The well-being scores in Table 2 produced roughly normal distributions. All skew and kurtosis values were less than two times their standard errors (in 10 of 14 cases, the skew or kurtosis values were less than one standard error for the variable in question). States with consistently high values in all domains include Massachusetts, New Hampshire, and Connecticut. These states therefore have relatively high state IQs, income, health, and education levels, and relatively low rates of crime and religiosity. Conversely, states scoring consistently low on the well-being indices include Mississippi, Louisiana, and Arkansas. As a general pattern, states in the South scored lowest on well-being, while states on the East Coast scored highest (other coastal states and the Midwest fell somewhere in between).

Table 3 informs discussion of the nomonological network of global state well-being by considering its correlation with other political, social, health, and economic variables. For all correlations in the table, a value of .236 is needed for statistical significance ($p<.05$) for a directional test (e.g., one-tailed) and a value of .279 is needed for a non-directional test (e.g., two-tailed).

Regarding political variables, global well-being was positively correlated with the percent of votes cast in the state for Barack Obama in the 2008 presidential election ($r=.47$). Although concerns about many issues shaped the 2008 election, this finding may reflect a greater liberalism in states with greater well-being. Consistent with our liberalism inference, states high in well-being also had higher minimum wages ($r=.35$), fewer residents owning guns; ($r=-.34$), and nominally higher Starbucks to Walmart ratios ($r=.23$). Likewise, states high in well-being were less likely to have amended their constitutions to ban gay marriage ($r=-.43$), and had a higher percentage of same-sex households ($r=.42$).

Religious affiliations by state also correlated moderately-to-strongly with nearly every other variable in the table. For example, states with higher percentages of Catholics (and Godless people) fared better in global state well-being and all of the economic variables in the table (e.g., state GPD, teacher salaries, and minimum wages—see Table 3). Conversely, states with many Protestants scored in the opposite direction on these variables. Surprisingly, religious affiliations correlated strongly with both active physicians per capita, and the number of traffic fatalities within a state. These patterns may be due to the heavy concentrations of Protestants in the South (and Catholics elsewhere), where well-being scores seem lowest. In sum, the correlations in Table 3 show a complex but interconnected nexus of variables; all of which co-vary with global state well-being.

4. Discussion

We created a multi-dimensional measure of well-being for the 50 U.S. states. The analytic strategy was to build scales by identifying variables that logically seemed to represent hypothesized sub-domains of well-being. These sub-domains included: IQ, religion, crime, education, health and income. Hierarchical analysis of the sub-domains showed that a general factor of well-being could be extracted from the data. The global index of well-being, created from a PCA on the sub-domains, predicted other important variables.

4.1. The g/well-being Nexus

At the level of the U.S. state, a nexus of inter-correlated variables exist that together seem to offer a reliable indicator of well-being. The well-being nexus also seems to overlap considerably with the *g* nexus. State IQ itself predicted most all of the variables that well-being did, and vice versa. Recall that the *g* nexus has both horizontal (variables that correlate and interact with g) and vertical (presumed causes of individual differences in *g*) components (Jensen, 1998). With regard to a well-being nexus, the horizontal and vertical components would be similar to those seen with GMA. Postulated causes of individual differences in well-being could be identified in the vertical dimension, while the consequences that follow from differences in well-being could be identified in the horizontal dimension.

For example, health rate differences across states, measures of government effectiveness, or levels of pre-natal care (together with other variables) might represent causes of group differences in well-being. Social, economic and educational/cognitive outcomes would likely then co-vary (horizontally) with state differences in the vertical direction. It is clear, however, that *g* is a central node in the well-being nexus.

Table 2
State ranks and standard scores for the global measure of well-being and its sub-domains.

State	Well-being Rank/score	Religiosity [a] Rank/score	Crime [a] Rank/score	Education Rank/score	Health Rank/score	Income Rank/score	IQ Rank/score
Alabama	47/76.9	49/72.5	38/86.0	40/88.3	44/83.2	44/82.9	45.5/95.7
Alaska	25/104.4	4/123.3	47/79.8	6/116.4	25/101.0	11.5/109.2	36/99.0
Arizona	36/90.5	17/106.4	41/84.7	26/98.0	37/90.3	35/90.4	43/97.4
Arkansas	48/75.1	44/79.8	43/82.8	48/75.9	47/77.6	47/77.1	42/97.5
California	30/98.6	12/110.4	31/91.6	14/110.4	21.5/103.3	20/104.7	48/95.5
Colorado	10/113.0	8/114.5	28/98.5	2/128.5	19/106.0	10/111.7	20/101.6
Connecticut	3/122.7	6.5/118.8	18/110.0	5/119.6	10/114.3	1/134.2	9/103.1
Delaware	33/94.9	24/102.5	40/84.8	41/86.7	41/87.2	9/112.8	28/100.4
Florida	35/92.2	29/100.3	39/85.9	30/95.5	39/89.6	26/101.7	38.5/98.4
Georgia	42/85.2	40/85.0	33/90.2	34/92.3	43/84.2	36/89.9	40/98.0
Hawaii	28/100.4	33/97.0	22/106.6	18/106.4	16/109.4	11.5/109.2	47/95.6
Idaho	21/105.6	37/92.5	16/111.0	12/112.0	7/116.4	38/89.7	22/101.4
Illinois	27/100.6	19/105.1	30/96.0	23/101.0	28/96.1	15/107.4	31/99.9
Indiana	32/96.5	34/95.7	27/102.0	44/85.4	35/93.4	28/98.0	19/101.7
Iowa	12/109.2	18/105.5	7/115.4	42/86.6	9/115.2	24/103.4	8/103.2
Kansas	23/104.9	36/94.0	25/102.9	16/107.6	21.5/103.3	23/103.5	12/102.8
Kentucky	39.5/86.7	42/84.6	24/103.1	47/77.9	36/93.1	45/79.8	34/99.4
Louisiana	49/69.1	46/77.6	50/72.2	43/85.5	49/66.9	48/75.8	49/95.3
Maine	7/115.3	3/124.0	2/126.5	31/95.0	11/113.7	30/97.1	6.5/103.4
Maryland	22/105.5	26/101.7	36/86.2	3/126.2	33/93.7	3/126.3	32/99.7
Massachusetts	1/127.2	5/122.3	15/111.1	1/135.2	5/120.5	4/124.0	1/104.3
Michigan	29/100.2	20/103.7	34/90.0	11/112.5	27/97.7	29/97.7	27/100.5
Minnesota	5/119.3	14/107.7	10/113.5	9/114.3	3/123.5	7/116.1	5/103.7
Mississippi	50/61.2	50/63.9	37/86.1	50/65.3	50/64.3	50/64.8	50/94.2
Missouri	34/93.7	35/94.8	32/91.2	37.5/89.5	34/93.6	33/95.3	25/101.0
Montana	16/108.1	22/103.2	6/115.5	19/104.9	17/109.3	37/89.8	6.5/103.4
Nebraska	19/107.1	28/100.4	11/113.3	33/93.1	15/111.4	21/104.3	15/102.3
Nevada	37/89.9	16/106.7	46/80.0	45/81.2	30/94.7	16.5/106.9	44/96.5
New Hampshire	2/126.3	1.5/126.8	3/124.8	17/107.2	2/125.4	5/121.6	2/104.2
New Jersey	6/117.6	13/110.0	17/110.8	13/111.9	14/111.7	2/128.7	12/102.8
New Mexico	44/84.7	27/101.4	48/79.1	10/113.5	45/82.1	46/77.3	45.5/95.7
New York	17/107.9	9/114.3	19/108.4	22/103.8	24/102.6	14/107.7	26/100.7
North Carolina	39.5/86.6	43/80.3	35/86.4	32/93.9	42/86.0	39/89.3	29/100.2
North Dakota	9/113.4	30.5/100.2	1/128.4	26/98.0	6/116.7	25/102.1	3.5/103.8
Ohio	31/98.0	25/102.3	29/98.3	39/89.0	29/95.0	31/96.6	18/101.8
Oklahoma	43/84.9	41/84.7	42/83.5	37.5/89.5	40/87.9	42/86.0	35/99.3
Oregon	15/108.3	11/111.2	20/107.7	15/107.9	12/113.3	34/95.2	23/101.2
Pennsylvania	26/103.9	23/103.1	23/105.2	26/98.0	26/100.2	18/105.9	21/101.5
Rhode Island	13/109.1	6.5/118.8	13/112.4	21/104.0	18/108.7	19/105.1	33/99.5
South Carolina	46/77.3	48/76.4	49/75.6	35/90.2	48/75.3	43/83.2	38.5/98.4
South Dakota	24/104.5	30.5/100.2	8/114.6	36/89.9	20/104.0	27/98.6	12/102.8
Tennessee	45/78.5	47/77.3	44/81.8	46/80.9	46/80.1	40/88.9	41/97.7
Texas	38/89.0	39/86.0	45/80.3	24/100.9	31.5/94.0	41/86.9	30/100.0
Utah	20/105.7	45/78.5	5/115.6	20/104.6	1/127.2	32/95.9	24/101.1
Vermont	4/122.5	1.5/126.8	4/122.8	7/116.3	4/121.2	22/103.7	3.5/103.8
Virginia	14/108.9	32/97.3	21/107.0	8/115.5	23/103.2	8/113.7	16.5/101.9
Washington	8/113.5	15/107.0	26/102.5	4/124.9	8/116.2	13/107.9	16.5/101.9
West Virginia	41/86.4	38/88.7	14/111.9	49/75.4	38/90.2	49/75.2	37/98.7
Wisconsin	11/111.8	10/112.1	9/113.9	28/97.0	13/112.0	16.5/106.9	10/102.9
Wyoming	18/107.5	21/103.2	12/112.7	29/96.6	31.5/94.0	6/119.9	14/102.4

Notes. The well-being scores for all variables result from the following conversion: Well-being = 100 + *Z* (15). States with identical well-being scores in a column may not be listed as tied in the rankings due to rounding error.

[a] Religiosity and crime were reverse coded such that higher well-being scores equal lower religiosity and lower crime within a state.

4.2. Religiosity and well-being

Perhaps the most surprising finding in the present study was the consistent and large negative correlations found between religiosity and the other well-being sub-domains (except crime, where the correlation was positive). Specifically, religiosity had the highest loading on the global well-being component. Between 26% (crime) and 52% (income) of the variance in the other diverse sub-domains was explained just by knowing a state's level of religiosity. In Table 3, the effects of religiosity seemed linked to the Protestant (versus Catholic or Godless) faith. This finding is consistent with Table 2, where well-being seemed lowest in the South (containing more Protestants) and higher in the East Coast (with more Catholics and Godless people).

Whatever the cause of the inverse relationship between religiosity and state well-being, we see the consequences as being significant. This is perhaps most clearly illustrated by appeal to the data on constitutional bans of gay marriage. The argument that same-sex marriage would lead to a breakdown in morality or of societal/family values (see, e.g., Family Research Council, 2001, 2002) is not supported by

Table 3
A nomonological network of global state well-being and its covariates.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. State well-being	–													
2. % Obama	.47	–												
3. Active doctors	.52	.71	–											
4. Traffic fatalities	−.71	−.58	−.67	–										
5. State GDP	.44	.38	.43	−.50	–									
6. Teacher salary	.39	.62	.64	−.67	.59	–								
7. Minimum wage	.35	.65	.49	−.41	.31	.59	–							
8. % Catholic	.61	.59	.57	−.48	.52	.53	.40	–						
9. % Protestant	−.68	−.47	−.43	.52	−.44	−.48	−.47	−.72	–					
10. % Godless	.58	.40	.25	−.38	.32	.31	.50	.28	−.63	–				
11. % gun owners	−.34	−.77	−.69	.61	−.46	−.70	−.50	−.64	.54	−.22	–			
12.S/W ratio	.23	.44	.20	−.25	.29	.42	.51	.14	−.39	.43	−.43	–		
13. Gay marriage ban	−.43	−.49	−.50	.48	−.37	−.39	−.36	−.44	.32	−.27	.37	.02	–	
14. Same-sex households	.42	.62	.53	−.51	.24	.39	.47	.34	−.55	.55	−.53	.37	−.40	–

Notes. A correlation of $r = .236$ is statistically significant ($p < .05$) for a directional test, and a correlation of $r = .279$ is statistically significant for a non-directional test. S/W ratio = Starbucks to Walmart ratio.

considering the data here. Correlations between banning gay marriage and the sub-domains were: religiosity (.45), crime (.34), education (−.26), health, (−.26), income (−.36), and IQ (−.36). These values suggest that well-being does not follow from a state's decision to constitutionally ban gay marriage. Likewise, the argument that morality stems only from a higher power (for arguments for and against, see Garcia & King, 2009) fares even worse, considering the correlations between the percentage of Godless people in a state and the sub-domains: religiosity (−.79), crime (−.32), education (.52), health (.51), income (.43), and IQ (.29). To the extent that morality leads to well-being (e.g., lower crime rates; lower teenage pregnancy rates), these correlations show that well-being can be achieved in the absence of religiously-derived morality (i.e., the correlations do not support the hypothesis that societal well-being depends on the religiosity of its citizens).

4.3. Implications

The global index of well-being could be used to inform decision makers with regard to important policies, programs and issues at the state and national levels. It could serve as a report card, a guide for what needs to be done next and where, and as a useful "flow chart" illustrating how outcome variables are not independent of other markers of well-being, but instead are intimately linked. An empirically created index of well-being, refined with better measures and more variables over time, could serve invaluable as an assessment tool for the well-being of the 50 U.S. states.

Decision makers could also track how changes in one variable might lead to changes in other variables and sub-domains. To the extent that what gets measured gets attention, highlighting differences in important societal outcomes across states might help prioritize the order in which different issues are addressed. Further, state rankings already exist on a number of economic and demographic variables via the U.S. Census and other sources. The data here show that these variables are not independent, but map logically into coherent domains, which themselves are statistically explained by a higher-order domain. Reporting outcome variables in a series of tables without any consideration of how variables across tables relate likely results in missing important patterns and relationships. In sum, well-being is a hierarchy/nexus of interconnected domains and variables, and so should be considered as such when reporting data on specific outcomes at the state level.

4.4. Limitations and directions for future research

Although we can describe the profile of high and low well-being states, the present data do not permit causal conclusions. For example, states high in well-being are found mainly in the East Coast; their citizens are more liberal, educated, wealthy, and intelligent on average, but less religious. All or none of these variables could be the causal link that binds them together, and binds them with other important outcomes (e.g., crime and health rates). Specific hypotheses about causality await further study.

Our global and domain specific indices should be replicated, extended to other variables, and recalculated with passing time. Other reliable indicators of the sub-domains could be added to the index. More and better variables might lead to identifying other important sub-domains, and a clearer picture of the well-being nexus. In particular, our educational-achievement sub-domain comprised only two correlated variables. Future research could perhaps identify other state-level outcome variables that increase the validity of the construct.

Also missing from our index are measures of personality variables at the state level. We are aware of state-level data on the NEO model of personality (Rentfrow, Gosling, & Potter, 2008). We did not report analyses related to personality and state well-being because they produced inconsistent and un-interpretable results. Specifically, considering a matrix of the five NEO traits (i.e., neuroticism, extraversion, openness, agreeableness and conscientiousness) and the seven well-being composites used here (i.e., the global index and the six sub-domains), only 10 of 35 correlations (29%) were statistically significant. Half of these involved correlations between conscientiousness and the sub-domains, but the correlations were in unexpected

directions (e.g., conscientiousness correlated −.31 with health; −.30 with education and .30 with crime).[2] Whether the odd relationships here reflect a problem with the well-being scales, the state-level personality scores, or both, is unknown.

A future research direction is to consider refining the level of analyses to major U.S. cities, or Metropolitan Statistical Areas, as well-being may differ across regions and cities within a state. One problem with creating indices like these, however, is the relative lack of data on many of the outcome variables included in this research. In general, the smaller the geographic unit of analysis, the less available data on that unit.

In sum, well-being at the state level appears to be comprised of separate but related sub-domains. Though the domains we selected to measure well-being seemed diverse (i.e., IQ, religiosity, health, crime, education and income), the general index of well-being explained 67% of their variance. The emergence of a strong general component suggests the existence of a well-being nexus, much like the *g* nexus identified in research on human intelligence (Jensen, 1998). Our data show, however, substantial overlap between the *g* nexus and the well-being nexus. It is hoped that future research refines the index to strengthen its psychometric properties, and then uses it to test hypotheses about possible reasons for why states differ–often markedly–in our measure of global well-being.

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[2] We mentioned in the introduction that when subjective well-being is framed as positive aspect, it seems similar to the personality trait, Extraversion. When framed as negative aspect, subjective well-being seems similar to the trait, Neuroticism. Neither trait, however, correlated with our global index of well-being (*r*'s = −.09 and −.18, respectively). Neuroticism did correlate −.30 with the health sub-domain, and −.30 with education. Likewise, extraversion correlated −.33 with the education sub-domain, although we have no theoretical explanation for why the relationship was negative.

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