



Geographic variation in empathy: A state-level analysis [☆]



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ABSTRACT

Empathy is often studied at the individual level, but little is known about variation in empathy across geographic regions and how this variation is associated with important regional-level outcomes. The present study examined associations between state-level empathy, prosocial behavior, and antisocial behavior in the United States. Participants were 79,563 U.S. residential adults who completed measures of cognitive and emotional empathy (i.e., perspective taking and empathic concern). Information on prosocial and antisocial behavior was retrieved from publicly available government databases. All indices of empathy were related to lower rates of violent crime, aggravated assault, and robbery. Total empathy was associated with higher well-being and higher volunteer rates. Implications for geographic variation in empathy, prosocial behavior, and antisocial behavior are discussed.

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1. Introduction

Empathy is defined as the tendency to be psychologically aware of others' feelings and perspectives (Decety & Lamm, 2006). As such, empathic responses are multi-dimensional in nature (Davis, 1994), comprised of distinct *emotional* components (tendencies to feel concern and compassion for others) and *cognitive* components (tendencies to imagine different viewpoints beyond one's own). These are commonly referred to as the *empathic concern* and *perspective-taking* components of empathy, respectively. Empathy can be considered either a situational response to others in need or an enduring individual characteristic that is relatively stable over time and across the lifespan (Eisenberg et al., 1999; Grünh, Rebucal, Diehl, Lumley, & Labouvie-Vief, 2008). In this particular paper, we conceptualize empathy as an enduring trait.

Most previous research has focused on individual-level correlates of empathic concern and perspective taking, neglecting how

between-state variation in empathy can explain regional variation in important outcomes, like volunteering, charitable giving, and crime. The current study examines geographic variation in empathic concern and perspective taking, and how state-level empathy is associated with state-level prosocial behavior, antisocial behavior, and well-being. These components of empathy have each been associated with a wide variety of outcomes, including lower rates of crime and higher rates of volunteering and helping others in need (Jolliffe & Farrington, 2004; Konrath & Grynberg, 2013; Unger & Thumhuri, 1997).

1.1. Individual-level associations with empathy

Empathy is associated with a wide array of positive outcomes, such as life satisfaction, emotional intelligence, and self-esteem (Eisenberg, Fabes, & Spinrad, 2006; Mayer, Caruso, & Salovey, 2000; Richardson, Hammock, Smith, Gardner, & Signo, 1994). Further, both empathic concern and perspective taking are related to higher rates of *prosocial* behavior, like volunteering, donating money to charity, and helping others in need (Davis, 1983; Grünh et al., 2008; Konrath, 2014; Wilhelm & Bekkers, 2010). People high in empathic concern do many prosocial things—they are more likely to return incorrect change, let a stranger go ahead of them when waiting in line, carry strangers' belonging, and do favors for their friends (Wilhelm & Bekkers, 2010). Empathic concern is one of the mechanisms thought to underlie the link

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between perspective taking and helping behavior (Batson, Duncan, Ackerman, Buckley, & Birch, 1981; Batson, Early, & Salvarani, 1997). Empathy is also related to lower rates of antisocial behavior. For example, Jolliffe and Farrington (2004) found that perspective taking was negatively related to perpetration of criminal acts (i.e., aggravated assault, robbery, burglary, and vehicle theft). Perspective taking has also been linked to less aggressive behavior while intoxicated (Giancola, 2003), fewer accusations of child abuse (Wiehe, 2003), and a reduced likelihood of committing sexual offenses (Burke, 2001). A lack of perspective taking is one of the prominent antecedents of perpetrating aggressive behavior and violent crime (Day, Mohr, Howells, Gerace, & Lim, 2012).

1.2. Regional variation in psychological characteristics

Psychological characteristics can vary across geographic regions and have been linked to important regional level outcomes (Rentfrow, Gosling, & Potter, 2008). For example, neuroticism aggregated at the state level has been positively linked to robbery and murder rates, and state-level agreeableness has been negatively linked to murder, robbery, and property crime rates (Rentfrow et al., 2008). There is considerably less research on regional comparisons of empathy. In one notable exception, Chopik, O'Brien, and Konrath (2016) examined variation in empathy in 63 different countries around the world, finding that collectivistic countries were higher in empathy on average. However, comparing large, diverse countries to one another often masks the considerable differences within a particular country (Chopik & Motyl, 2017).

The United States had the seventh highest empathy scores out of the 63 countries examined in Chopik, O'Brien, and Konrath (2016). Considering that the U.S. contains significant regional variation in psychological characteristics (Rentfrow et al., 2008), we suspect that empathy may also vary regionally with the U.S. For example, research on variation in the Big Five personality traits (i.e., openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism) found that people in the U.S. cluster into three different personality groups, each with a distinct 'personality profile' (e.g., the 'friendly and conventional' cluster in the Midwest had high extraversion, agreeableness, and conscientiousness, and low neuroticism and openness). Each of these clusters corresponded to a particular region in the U.S., with each regional cluster of personality related to variation in political, sociological, economic, and health outcomes (Nisbett & Cohen, 1996; Rentfrow et al., 2013). It is unclear whether empathy shows similar regional variation and whether this variation is reliably associated with regional indicators. Geographic variation in psychological characteristics is the cornerstone of many theories in psychology and often forms the basis of entire disciplines (Rentfrow, 2014). Indeed, examining how empathy varies geographically can help uncover the reasons why social behavior also varies geographically. The current study seeks to situate empathy in a broader context, to enable researchers to further examine the mechanisms that give rise to regional disparities in important outcomes.

1.3. The current study

The current study examined geographic variation in dispositional empathic concern, perspective taking, and total empathy in a sample of $N = 79,563$ adults residing in the 50 U.S. states and the District of Columbia. To our knowledge, no study to date has examined within-country differences in trait empathy and how these differences may relate to region-level outcomes.

We used individual-level relationships as a reference for predicting potential state-level relationships. There are multiple forms of prosocial and antisocial behavior which are often distinguished

by the target of such behavior. For example, *formal* prosocial behavior is considered engagement with a broader organization; *informal* social behavior is considered helping behavior toward family, friends, and strangers. In the current study, we examine formal prosocial behavior as there are accurate state-level data available on these indicators. Specifically, prosocial behavior was operationalized as state-by-state rates of volunteering and charitable behavior. Antisocial behavior was operationalized with state-level crime rates per capita. We hypothesized that higher state-wide empathy scores would be related to more prosocial behavior (e.g., volunteering), less antisocial behavior (e.g., committing crime), and higher well-being.

2. Method

2.1. Participants

Participants were 79,563 adults (55.8% Male), ranging in age from 18 to 90 ($M = 38.12$, $SD = 13.42$), who volunteered to complete an online survey. The majority of respondents were Caucasian (86.8%), followed by Asian or Asian American (6.1%), multi-racial/other (2.8%), Black or African American (2.2%), and Hispanic (2.1%).¹ All available data were used; no stopping rule was implemented and there were no data exclusions. Portions of this data are published elsewhere in a report examining cross-cultural comparisons in empathy (Chopik et al., 2016). The sample size from each of the states correlated highly with each state's population ($r = 0.96$, $p < 0.001$). Although our large sample of participants allowed for more precise estimates of state-level means, ultimately our analysis was done on these 51 observations, as in previous work on national differences in psychological characteristics (Rentfrow et al., 2008). Thus, studies of geographic variation should be interpreted in light of the number of observations used in the focal analysis, rather than the number of observations used to yield aggregate scores for an area. We note this as a limitation of the current study and advise replication of the following associations in different samples and at different units of analysis, which would help to increase the confidence of our findings.

2.2. Materials & procedure

Participants volunteered and completed an online survey through the fourth author's website in 2010–2011. Upon completion of all questionnaires, survey respondents received personalized feedback on their empathy scores. State of residence was determined from participants' IP addresses (see Rentfrow et al., 2013 for a similar approach). State-level indices of empathic concern and perspective taking were created by averaging the scores of the participants living within a particular state.

2.2.1. Empathy

Participants completed the empathic concern and perspective taking subscales of the Interpersonal Reactivity Index (Davis, 1983), a widely used measure of individual differences in empathy. The 7-item *empathic concern* subscale reflects a person's other-oriented feelings of compassion for the misfortunes of others and represents an emotional component of empathy (e.g., "I often have tender, concerned feelings for people less fortunate than me"). The 7-item *perspective taking* subscale reflects a person's tendency to imagine others' points of view and represents a cognitive or intellectual component of empathy (e.g., "I sometimes try to under-

¹ Our sample is slightly more male (55.8% v. 50.8%; $\chi^2(1) = 1386.76$, $p < 0.001$), had a higher proportion of White, non-Hispanic respondents (86.8% v. 77.1%; $\chi^2(1) = 4239.60$, $p < 0.001$), and a lower proportion of adults over the age of 65 (3.6% v. 14.9%; $\chi^2(1) = 7972.78$, $p < 0.001$) compared to the general US population.

stand my friends better by imagining how things look from their perspective”). Participants were asked to rate the extent to which they agreed with each item on a scale ranging from 1 (*does not describe me well*) to 5 (*describes me very well*). Items were averaged to create subscales for empathic concern ($M = 3.77$, $SD = 0.04$; $\alpha = 0.83$) and perspective taking ($M = 3.65$, $SD = 0.04$; $\alpha = 0.82$). Empathic concern and perspective taking were positively correlated, $r = 0.51$, $p < 0.001$, consistent with prior research (Davis, 1983). Because the two subscales were correlated, we also computed a simplified composite scale of “total empathy” ($M = 3.71$, $SD = 0.03$; $\alpha = 0.82$), and included it in all the analyses below.

2.2.2. Prosocial behavior

Prosocial behavior was measured by three indices: the percentage of a state’s population volunteering, the average hours of volunteering per person in a state, and a state’s “giving ratio,” which is the average percentage of income given to charity. The volunteering data were obtained from the Corporation for National and Community Service (CNCS)’s 2010 assessment of “Volunteering in America.” The CNCS is a government agency that encourages service activities and is primarily known for funding AmeriCorps (Corporation for National & Community Service, 2010). The percentage of income given to charity was determined from charitable deductions reported on income taxes in each state and were summarized in a 2012 report by the Chronicle of Philanthropy (The Chronicle of Philanthropy, 2012); data from other years were unavailable.

2.2.3. Antisocial behavior

Antisocial behavior was measured by two indices: the violent crime rate per capita (i.e., per 100,000 people) and the property crime rate per capita. The violent crime rate included four different types of crime: murder, robbery, aggravated assault, and rape. Property crime rate included three different types of crime: burglary, larceny theft, and vehicle theft. Superordinate categories of “violent crime” and “property crime” were analyzed below, in addition to the subordinate crimes within each category. These data were obtained from the Uniform Crime Reporting Statistics (UCRS) for 2011 (Federal Bureau of Investigation, 2014). The UCR program is a voluntary program that law enforcement agencies participate in across the United States and data collection is overseen by the FBI.

2.2.4. Well-being

State-level well-being was drawn from the 2010 Gallup-Healthways Well-Being Index and is a composite of six domains—life evaluation, emotional health, work environment, physical health, healthy behaviors, and access to basic necessities (Gallup, 2011).

2.2.5. Covariates

The number and type of control variables in studies of the geographic variation of psychological characteristics vary considerably (Brethel-Haurwitz & Marsh, 2014; Park & Peterson, 2010; Rentfrow et al., 2008). In the current study, we controlled for each state’s male-to-female sex ratio, median age, proportion of White, non-Hispanic residents, and median income (Brethel-Haurwitz & Marsh, 2014; Chopik & Motyl, 2017). This information was taken from the U.S. Census (U.S. Bureau of the Census, 2011, 2012).

3. Results

3.1. Null hypothesis significance testing and effect sizes

A typical approach in psychological research is to report p -values and confidence intervals which aid researchers in making

generalizations to future observations (e.g., extending inferences from one group of observations in a study to an additional group of observations sampled from the broader population). However, because we have observations from every state, it is unclear what future sampling could occur (i.e., there are only 51 states/regions in the U.S.). As such, we resort to discussing only the results that surpass an effect size benchmark greater than $r/\beta = |0.15|$ (see Rentfrow et al., 2008 for a similar approach). This approach also enables us to discuss larger effects that did not reach statistical significance given our small sample size of 51 observations. For the reader curious about the traditional significance testing results, we refer them to a version of the results that contains p -values and confidence intervals in Supplementary Tables 2–40.

3.2. Geographic variation

State-level scores for empathy were computed by taking the average of empathic concern, perspective taking, and total empathy of residents living within each state. Means, standard deviations, sample sizes, and rankings for state-level empathy are presented in Table 1. The states with the highest empathic concern scores were Rhode Island, Mississippi, and Montana; the states with the lowest empathic concern scores were Indiana, Alabama, and Nevada. The states with the highest perspective taking scores were North Dakota, Hawaii, and Vermont; the states with the lowest perspective taking scores were Alabama, Nevada, and Delaware. The states with the highest total empathy scores were Rhode Island, Montana, and Vermont; the states with the lowest empathy scores were Delaware, Alabama, and Nevada. Geographic variation in empathic concern (Fig. 1a), perspective taking (Fig. 1b), and total empathy (Fig. 1c) are presented in Fig. 1.

3.2.1. Sample descriptives

The intraclass correlations (ICC-1), which measure how strongly observations within a group are related, for empathic concern, perspective taking, and total empathy were 0.0006, 0.0011, and 0.0011, which are consistent with previous research examining geographic variation in psychological characteristics within the U.S. (Rentfrow et al., 2013; Rentfrow, personal communication, November 24, 2016). Group-mean reliabilities (ICC-2) were computed by taking two random halves of the total sample and computing state level means. The ICC-2s for empathic concern, perspective taking, and total empathy were 0.79, 0.74, and 0.76, which are also consistent with previous research examining geographic variation in psychological characteristics within the U.S. (Rentfrow et al., 2013; Rentfrow, personal communication, November 24, 2016). Spatial autocorrelations were low (Moran’s $I_s < |0.05|$) and not significant, suggesting that (along with Fig. 1a–c) there is little consistent geographic clustering of states with respect to empathy. Thus, the empathy of one state was unrelated to empathy levels of adjacent states.

3.3. Is state-level empathy related to state-level indicators of prosocial behavior, antisocial behavior, and well-being?

We hypothesized that higher empathy would be associated with higher rates of charity, volunteering, and well-being, and lower rates of violent and property crime. The bivariate correlations between these variables can be found in Supplementary Table 1. Social indicators were mostly associated in intuitive ways—prosocial behaviors were intercorrelated with each other (e.g., states high in volunteering were also high in charitable donations) and negatively correlated with antisocial behaviors. However, a few surprising associations emerged: volunteering was associated with higher rates of rape and a state’s giving ratio was associated with more property crime. State-level well-being was

Table 1
Means and standard deviations for empathic concern, perspective taking, and total empathy score by state, including rank.

| State | Sample size <i>n</i> | Empathic concern | | | Perspective taking | | | Overall empathy | | |
|----------------|-------------------------|------------------|-----------|-------------|--------------------|-----------|-------------|-----------------|-----------|-------------|
| | | <i>M</i> | <i>SD</i> | <i>Rank</i> | <i>M</i> | <i>SD</i> | <i>Rank</i> | <i>M</i> | <i>SD</i> | <i>Rank</i> |
| Alabama | 772 | 3.72 | 0.85 | 50 | 3.57 | 0.75 | 49 | 3.65 | 0.69 | 50 |
| Alaska | 255 | 3.74 | 0.83 | 42 | 3.63 | 0.73 | 36 | 3.69 | 0.69 | 42 |
| Arizona | 1600 | 3.80 | 0.76 | 14 | 3.61 | 0.74 | 46 | 3.71 | 0.71 | T32 |
| Arkansas | 538 | 3.77 | 0.80 | T28 | 3.68 | 0.80 | 15 | 3.72 | 0.65 | 21 |
| California | 11750 | 3.79 | 0.76 | 21 | 3.69 | 0.73 | 7 | 3.74 | 0.65 | 10 |
| Colorado | 1780 | 3.75 | 0.75 | T33 | 3.67 | 0.71 | 19 | 3.71 | 0.63 | T28 |
| Connecticut | 994 | 3.77 | 0.79 | T28 | 3.68 | 0.76 | 16 | 3.72 | 0.68 | 24 |
| Delaware | 172 | 3.75 | 0.80 | T39 | 3.55 | 0.75 | 51 | 3.65 | 0.59 | 49 |
| Wash DC | 654 | 3.82 | 0.71 | 7 | 3.69 | 0.69 | 9 | 3.76 | 0.69 | T5 |
| Florida | 3226 | 3.75 | 0.81 | T35 | 3.65 | 0.77 | 30 | 3.70 | 0.69 | 34 |
| Georgia | 1997 | 3.78 | 0.79 | 23 | 3.65 | 0.76 | 28 | 3.71 | 0.68 | 27 |
| Hawaii | 379 | 3.76 | 0.78 | 31 | 3.71 | 0.75 | 2 | 3.74 | 0.67 | T11 |
| Idaho | 361 | 3.73 | 0.81 | 45 | 3.62 | 0.74 | 40 | 3.68 | 0.66 | T44 |
| Illinois | 3480 | 3.81 | 0.77 | 9 | 3.68 | 0.74 | T10 | 3.75 | 0.69 | 7 |
| Indiana | 1201 | 3.72 | 0.80 | 49 | 3.63 | 0.77 | 37 | 3.68 | 0.66 | 46 |
| Iowa | 688 | 3.75 | 0.79 | 41 | 3.62 | 0.73 | T44 | 3.68 | 0.69 | 43 |
| Kansas | 679 | 3.74 | 0.76 | 43 | 3.62 | 0.73 | T41 | 3.68 | 0.67 | T44 |
| Kentucky | 712 | 3.73 | 0.80 | 46 | 3.62 | 0.75 | T44 | 3.67 | 0.68 | 48 |
| Louisiana | 569 | 3.79 | 0.81 | T15 | 3.65 | 0.72 | 31 | 3.72 | 0.68 | 23 |
| Maine | 362 | 3.81 | 0.77 | 10 | 3.71 | 0.75 | T5 | 3.76 | 0.65 | 4 |
| Maryland | 1898 | 3.73 | 0.78 | 47 | 3.62 | 0.75 | T41 | 3.67 | 0.67 | 47 |
| Massachusetts | 2516 | 3.79 | 0.76 | T19 | 3.68 | 0.73 | 12 | 3.74 | 0.66 | 14 |
| Michigan | 2290 | 3.77 | 0.77 | 25 | 3.67 | 0.74 | 17 | 3.72 | 0.65 | 21 |
| Minnesota | 1644 | 3.79 | 0.76 | 18 | 3.68 | 0.74 | T10 | 3.74 | 0.65 | T11 |
| Mississippi | 239 | 3.85 | 0.77 | 2 | 3.60 | 0.79 | 48 | 3.73 | 0.65 | 18 |
| Missouri | 1422 | 3.77 | 0.76 | 24 | 3.64 | 0.75 | 35 | 3.71 | 0.69 | 31 |
| Montana | 257 | 3.85 | 0.74 | 3 | 3.71 | 0.73 | T5 | 3.78 | 0.63 | 2 |
| Nebraska | 443 | 3.73 | 0.77 | 48 | 3.66 | 0.72 | 22 | 3.69 | 0.65 | 39 |
| Nevada | 812 | 3.63 | 0.83 | 51 | 3.57 | 0.79 | 50 | 3.60 | 0.71 | 51 |
| New Hampshire | 483 | 3.74 | 0.78 | 44 | 3.65 | 0.75 | 25 | 3.70 | 0.65 | 38 |
| New Jersey | 2373 | 3.77 | 0.79 | 30 | 3.65 | 0.76 | 28 | 3.71 | 0.67 | 30 |
| New Mexico | 501 | 3.75 | 0.79 | T37 | 3.66 | 0.78 | 23 | 3.71 | 0.68 | T32 |
| New York | 5353 | 3.80 | 0.79 | 13 | 3.67 | 0.76 | 18 | 3.73 | 0.70 | 15 |
| North Carolina | 1993 | 3.81 | 0.77 | 11 | 3.68 | 0.72 | T13 | 3.74 | 0.71 | 8 |
| North Dakota | 136 | 3.75 | 0.84 | T39 | 3.71 | 0.76 | 1 | 3.73 | 0.68 | 16 |
| Ohio | 2652 | 3.75 | 0.78 | T33 | 3.64 | 0.76 | T32 | 3.70 | 0.67 | 36 |
| Oklahoma | 647 | 3.77 | 0.76 | 27 | 3.67 | 0.73 | 20 | 3.72 | 0.65 | 25 |
| Oregon | 1550 | 3.82 | 0.75 | 8 | 3.69 | 0.72 | 8 | 3.76 | 0.64 | T5 |
| Pennsylvania | 3144 | 3.75 | 0.81 | T35 | 3.63 | 0.75 | T38 | 3.69 | 0.68 | 41 |
| Rhode Island | 256 | 3.86 | 0.77 | 1 | 3.71 | 0.74 | 4 | 3.78 | 0.66 | 1 |
| South Carolina | 678 | 3.78 | 0.77 | 22 | 3.62 | 0.76 | 43 | 3.70 | 0.65 | 36 |
| South Dakota | 121 | 3.80 | 0.75 | 12 | 3.64 | 0.69 | T32 | 3.72 | 0.61 | 21 |
| Tennessee | 1137 | 3.79 | 0.77 | T19 | 3.64 | 0.75 | 34 | 3.72 | 0.66 | 26 |
| Texas | 6022 | 3.77 | 0.77 | 26 | 3.65 | 0.76 | 28 | 3.71 | 0.67 | T28 |
| Utah | 696 | 3.83 | 0.78 | 6 | 3.66 | 0.74 | 24 | 3.74 | 0.66 | 9 |
| Vermont | 224 | 3.84 | 0.70 | 4 | 3.71 | 0.73 | 3 | 3.77 | 0.65 | 3 |
| Virginia | 3149 | 3.75 | 0.77 | T37 | 3.65 | 0.73 | 26 | 3.70 | 0.62 | 36 |
| Washington | 2931 | 3.79 | 0.78 | 17 | 3.68 | 0.73 | T13 | 3.74 | 0.65 | 13 |
| West Virginia | 214 | 3.79 | 0.79 | T15 | 3.66 | 0.78 | 21 | 3.73 | 0.65 | 17 |
| Wisconsin | 1487 | 3.84 | 0.77 | 5 | 3.61 | 0.73 | 47 | 3.72 | 0.70 | 19 |
| Wyoming | 126 | 3.76 | 0.73 | 32 | 3.63 | 0.71 | T38 | 3.69 | 0.62 | 40 |

Note. lower ranking corresponds to higher empathy. T corresponds to ties between states.

positively associated with volunteering and negatively associated with antisocial behaviors. Because our covariates were often associated with our outcomes (but not empathy) at the bivariate level, we report empathy-outcome associations both with and without the covariates.

To test our main hypotheses, we regressed each facet of empathy (empathic concern, perspective taking, and total empathy) on each prosocial behavior, each antisocial behavior, and well-being separately while controlling for each state's male-to-female sex ratio, median age, proportion of White, non-Hispanic residents, and median income (Brethel-Haurwitz & Marsh, 2014). We employed a hierarchical approach, such that a facet of empathy was entered in the first step, followed by the four control variables. We limit our discussion to estimates that included the covariates, as there were associations between the covariates and prosocial and antisocial behaviors. Applying our benchmark of $\beta = |0.15|$,

we found many associations between empathy and our dependent variables. As seen in Table 2, total empathy was associated with more volunteering hours, a higher volunteering rate, lower rates of overall violent crime, lower rates of aggravated assault, and lower rates of robbery. Total empathy was associated with higher levels of well-being. Empathic concern was associated with a higher volunteering rate, more volunteering hours, a lower violent crime rate, lower rates of robbery, and lower rates of burglary. Perspective taking was associated with a lower violent crime rate, lower rates of aggravated assault, lower rates of robbery, and higher well-being. Empathy was largely unrelated to property crime after controlling for the covariates, with exception of an association between empathic concern and lower rates of burglary.

None of the aforementioned results changed when controlling for the similarities in empathy of adjacent states (i.e., in a spatial regression). This is likely because, as reported earlier, empathy

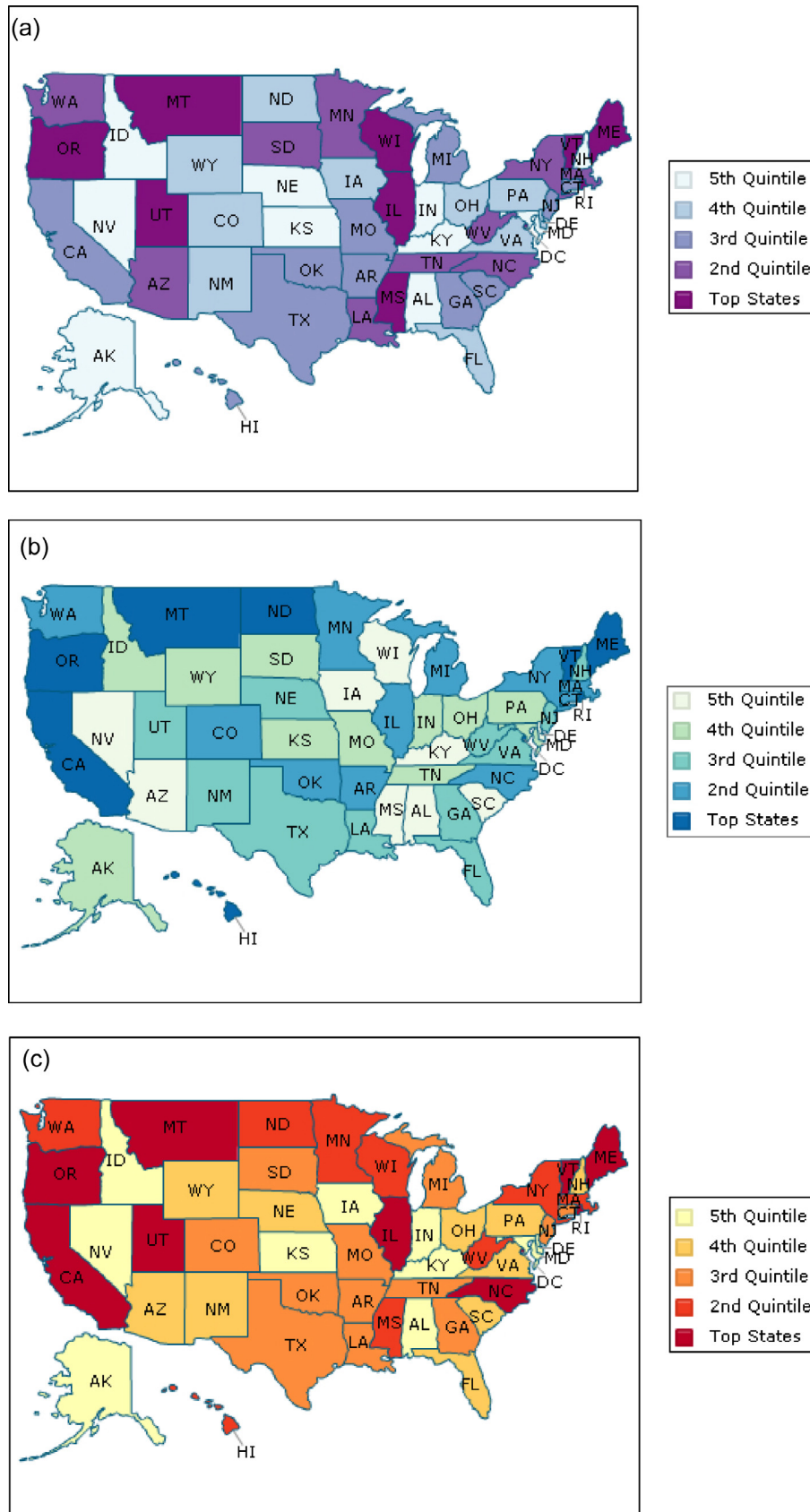


Fig. 1. (a–c) Graphical depictions of U.S. geographic variation in mean levels of empathic concern, perspective taking, and total empathy score. (a) Geographic variation in empathic concern. (b) Geographic variation in perspective taking. (c) Geographic variation in total empathy.

Table 2

Regressions predicting relational variables from empathic concern, perspective taking, and total empathy score.

| Dependent variable | Empathic concern β | Perspective taking β | Total empathy β |
|--------------------|------------------------------|-------------------------------|------------------------------|
| Volunteering hours | 0.07/ 0.21 | 0.10/0.06 | 0.10/ 0.15 |
| Volunteering rate | 0.12/ 0.21 | 0.18 /0.09 | 0.17 / 0.17 |
| Giving ratio | 0.04/0.06 | – 0.28 /–0.07 | –0.13/–0.004 |
| Violent crime | – 0.34 /– 0.35 | – 0.37 /– 0.29 | – 0.40 /– 0.35 |
| Murder | –0.07/–0.10 | –0.07/–0.08 | –0.08/–0.10 |
| Aggravated assault | – 0.30 /– 0.31 | – 0.30 /– 0.22 | – 0.35 /– 0.29 |
| Rape | – 0.20 /–0.10 | –0.09/–0.08 | – 0.17 /–0.10 |
| Robbery | – 0.28 /– 0.33 | – 0.38 /– 0.34 | – 0.37 /– 0.36 |
| Property crime | –0.03/–0.06 | – 0.22 /–0.04 | –0.13/–0.05 |
| Burglary | –0.06/– 0.17 | – 0.26 /–0.05 | – 0.17 /–0.12 |
| Larceny | 0.04/0.03 | – 0.17 /–0.03 | –0.07/0.003 |
| Vehicle theft | – 0.18 /–0.11 | –0.06/0.03 | –0.14/–0.05 |
| Well-being | –0.05/0.14 | 0.36 / 0.23 | 0.16 / 0.20 |

Note. Estimates on the left side of the divider is the effect of that subscale of empathy without covariates controlled for. Estimates on the right side of the divider is the effect of that subscale of empathy with covariates (male-to-female sex ratio, median age, proportion of White, non-Hispanic residents, and median income) controlled for. Bolded estimates are those that surpassed our threshold of $\beta = |0.15|$.

levels in one state were unrelated to empathy levels in adjacent states.

4. Discussion

In the current study, we examined how empathy varied geographically and whether this variation was related to state-level prosocial behavior, antisocial behavior, and well-being. We found that empathic concern and total empathy were positively related to state-level volunteering and higher well-being. All three indices of empathy were consistently related to lower rates of violent crime, aggravated assault, and robbery. Since empathy is associated with a wide array of interpersonal and intrapersonal outcomes at the individual level (Konrath & Grynberg, 2013), examining within-country variation in empathy can provide insight into broader societal patterns in social behavior.

Our finding that empathy was associated with the state-level volunteering rate aligns well with previous research demonstrating that more empathic people participate in more prosocial behavior, such as helping others who are in need (Davis, 1983; Grünh et al., 2008; Konrath, 2014; Wilhelm & Bekkers, 2010). The observation that empathy was associated with lower rates of violent crime in the current study is also consistent with associations found at the individual level (Jolliffe & Farrington, 2004). The association between state-level empathy and state-level indices of prosocial and antisocial behavior suggests that between-state differences in important outcomes like crime, economics, and health, may be partially attributable to psychological characteristics of people living in those places (Rentfrow et al., 2008). The lack of associations between empathy and some of our outcomes (murder, rape, property crimes) was puzzling. One practical reason for the lack of association between state-level empathy and rates of murder and rape might be the low incidence of these violent crimes and that they might be explained by additional variables not considered in the current study. With respect to the lack of associations with rates of property crime, we can only speculate about possible reasons why empathy might not predict these crimes. One observation is that many of the crimes that empathy was associated with (aggravated assault, robbery) involve interpersonal interactions. Property crimes (burglary, larceny, vehicle theft) may or may not entail interactions with other people, but are classified as such because property crimes do not entail

direct contact with a victims (e.g., Catalonao, 2010). Thus, lower state-levels of empathy may only predict infractions that involve other people and not infractions that are impersonal.

One prominent direction for future research is to examine why empathy varies geographically, both between and within countries. Rentfrow et al. (2008) suggest that there are at least three mechanisms that give rise to geographic variation in psychological characteristics: selective migration (e.g., moving to where physical and psychological needs are met), environmental influences (e.g., sunlight and temperature), and social influences (e.g., engaging in social interactions with others). For each of these mechanisms, hypotheses and speculation can be made for why empathy would vary geographically: empathic people might move to certain areas where other empathic people live (Brethel-Haurwitz & Marsh, 2014); people might be less empathic if they live in colder places or have less exposure to sunlight (Konrath, 2016); the behavior and empathy of one's neighbors might make people more empathic (Chopik & Motyl, 2017).

Another direction for future research is to examine regional variation at more discrete levels of analysis. In a similar fashion to how cross-cultural studies often neglect important within-country variability, state-level analyses may neglect important within-state variability (Park & Peterson, 2010). Worth noting, many of the states were relatively high in empathy (e.g., total empathy ranged from 3.60 to 3.78). This restricted range and high levels of empathy have implications for many of our outcome measures. For example, the difference in total empathy between the five states with the highest violent crime rate ($M = 3.68$; $Z_{score} = 0.49$) and the five states with the lowest crime rate ($M = 3.73$; $Z_{score} = -0.71$) is small when examined at such a broad level. Within-state variation might allow for higher resolution predictions and the inclusion of indicators that may not be as meaningful or available at the broader state-level (e.g., socioeconomic status, weather, urban versus rural designations, or city/county-level population density).

One limitation is that our study was primarily observational and correlational, making it difficult to interpret causality in the effects we observed. Although there is some experimental evidence suggesting a causal link between empathy and prosocial and antisocial behavior (Batson, 2011; Galinsky & Moskowitz, 2000), how these constructs operate in concert with one another at the state-level might be different. Some people may be more empathic, contributing to higher levels of charitable giving at the state-level. However, those living in more charitable areas may have become more empathic after witnessing the generous behavior in that area (e.g., a result of social influence). Further, the amount of responses for any particular state may not be fully representative of that state's population. The range of responses received from all of the states varied greatly, from 121 responses in South Dakota to 11,750 responses in California. Although the number of participants was highly correlated with state population sizes, measuring empathy in a nationally representative sample from the U.S. could alleviate this issue.

5. Conclusion

Despite these limitations, the current study provides a valuable first step in examining geographic variation in empathy and the potential implications of this variation. We observed state-by-state differences in empathy and found that these differences were related to many of the same outcomes observed at the individual level. Future research can clarify the mechanisms that give rise to geographic variation in empathy and further explore the relationships between psychological characteristics and important societal level outcomes.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.jrp.2016.12.007>.

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