



Only in America: Cold Winters Theory, race, IQ and well-being

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ABSTRACT

Cold Winters Theory (CWT; Lynn, 1991) offers a viable explanation for race differences in intelligence. It proposes that IQ gaps exist because of different evolutionary pressures faced by the ancestral humans who left Africa, compared with those who remained. Support for CWT comes by showing correlations between national temperature and IQ. Here we test whether temperature correlates with IQ (and other well-being variables) across the 50 U.S. states. Although human evolution is recent, copious and regional (Wade, 2014), insufficient time has passed for it to have operated on non-native residents of the USA. Instead, CWT must predict no difference—or remain agnostic—on the existence of state-level correlations between temperature and IQ. Nonetheless, even after controlling for race, temperature strongly predicts state: IQ, religiosity, crime, education, health, income and global well-being. Evolution is therefore not necessary for temperature and IQ/well-being to co-vary meaningfully across geographic space.

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1. Introduction

Among the most well-replicated findings in social science is that mean IQ scores co-vary with race (for reviews, see, Neisser et al., 1996; Roth, Bevier, Bobko, Switzer, & Tyler, 2001; Rushton & Jensen, 2005). Currently, the Black–White IQ gap is about one standard deviation. The size of this gap has remained relatively stable since it was first discovered, nearly 100 years ago (Rushton & Jensen, 2006). Considerable evidence likewise exists that (Eastern) Asians average higher than Whites on IQ tests (see Rushton & Jensen, 2005, for a review).

More recent research has narrowed the lens by focusing on IQ differences across national origins and/or ethnicities. Lynn and colleagues have calculated IQs for over 100 nations. Their IQ estimates show considerable variance across countries, and correlate strikingly with important social, economic, and political outcomes (Kanazawa, 2008; Lynn & Meisenberg, 2010; Lynn & Vanhanen, 2012; Lynn & Vanhanen, 2002; Templer & Arikawa, 2006; Vanhanen, 2012). In fact, the idea that geographic units (i.e., nations and/or the 50 U.S. states) can

be assigned IQ scores—and that these scores might co-vary meaningfully with important social outcomes—has sparked intense research interest over the last decade (see, e.g., Pesta & McDaniel, 2014; Pesta, McDaniel, & Bertsch, 2010; Reeve, 2009; Reeve & Basalik, 2010; Templer & Rushton, 2011).

Though IQ race differences exist, no consensus as to their cause is likely forthcoming. Explanations for these effects run the gamut from those that appeal to a full blank-slate (Gould, 1996), to those that implicate genetics to some highly-significant degree (Rushton & Jensen, 2005). In terms of parsimony, one promising explanation for IQ race gaps is Cold Winters Theory (CWT; Lynn, 1991, 2006). CWT proposes that race differences exist because of different evolutionary pressures faced by the ancestral humans who left Africa, compared with those who remained. Ancient humans leaving Africa faced “cold winters”—significantly harsher environments that placed a natural-selection premium on higher IQ. Conversely, ancient humans remaining in Africa faced no such strong evolutionary pressure. Over relatively rapid evolutionary time, mean race differences in IQ (and other psycho-social variables) emerged (see, e.g., Wade, 2014).

Support for CWT comes by showing that mean temperature in some geographic regions correlates with mean IQ. For example, it is now well-established that strong correlations exist

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between IQ and temperature at the national level (Kanazawa, 2008; Lynn & Meisenberg, 2010; Lynn & Vanhanen, 2012; Lynn & Vanhanen, 2002; Templer & Arikawa, 2006; Vanhanen, 2012). In terms of survival probability, warmer climates seem to tolerate significantly lower human IQ, relative to colder, harsher climates.

Nonetheless, IQ and temperature may co-vary across geography for reasons having nothing to do with evolution (see, e.g., Jensen, 2006). One potential example regards the 50 U.S. states. Although human evolution has been recent, copious, and regional (Wade, 2014), temperature/IQ correlations in just the USA likely cannot be caused by any of evolution's forces (natural selection, mutation, gene flow, gene drift). If IQ and temperature indeed correlate within the 50 U.S. states, then evolution is not necessary for these variables to co-vary meaningfully across geography.

The purpose of the present study is to test whether state temperature correlates with state IQ (or any other sub-domain of human well-being, including those variables identified by Pesta et al., 2010, i.e., religiosity, crime, education, health, income and global well-being). Though the existence of temperature/well-being correlations for the 50 U.S. states would not falsify CWT, they would show that a key prediction of CWT can be realized independent of whether the theory is true (i.e., potentially illustrating the fallacy of affirming the consequent: If CWT is true, then temperature and IQ should correlate. Temperature and IQ do correlate; therefore, CWT is true). Hence, we correlate mean state temperature with various measures of state well-being—both before and after controlling for race (operationalized as percent-Black, and as percent-Native American).

2. Method

2.1. Sample and measures

The unit of analysis was the U.S. state, yielding a sample size of 50. We coded mean temperature by state from the *National Oceanic and Atmospheric Administration* (2014). These values were the most recent data available from this website, and were averages within states for the years 1971 through 2000. Given the relative distance of Alaska and Hawaii from the rest

of the USA, we coded two measures of state temperature: one included all 50 states; the other excluded both Alaska and Hawaii.

All other data were derived from variables coded within the decade of the 2000s. Pesta and McDaniel (2014) have shown that (at least within the past decade) state correlations between variables comprising well-being are near perfect, year over year. For example, the percentage of Black residents across the 50 states correlates greater than .98 for the years 2000, 2004, 2008 and 2010 (Pesta & McDaniel, 2014).

We operationalized race as the percentage of Black residents within each state (Templer & Rushton, 2011, used this measure as a proxy for state skin color). The percent-Black and percent-Native American data were taken from Pesta et al. (2010, as originally coded from the U.S. Census). We included percent-Native American as a variable because it offers a contrast to the percent-Black data. Whereas the latter have resided in the USA for just a few hundred years, the former have resided in the USA for thousands of years. The percent-Native American data therefore served as a cross-validation of our findings, relative to the percent-Black variable.

The state well-being data were also taken from Pesta et al. (2010), who derived a global scale of well-being from six hypothesized sub-domains, including: intelligence, religiosity, crime, education, health, and income. The IQ sub-domain was obtained from McDaniel (2006) who estimated state IQs from public school achievement test scores. The religiosity scale was created with state-level survey data measuring fundamentalist religious beliefs (e.g., “My holy book is literally true;” “Mine is the one true faith”). The crime scale was derived from burglary, murder, rape, and violent crime rates, as well as the number of inmates per capita, in each state. Education included the percentage of state residents with college degrees, and the percentage of the workforce in jobs related to science, technology, engineering or mathematics. The health scale contained a set of variables ranging from infant mortality to the incidence of obesity, smoking, and heart disease by U.S. state. Finally, income was composed of variables including: income per capita, disposable income per capita, percent of families in poverty, and percent of individuals in poverty. Complete descriptions and statistical analyses of the well-being variables appear in Pesta et al. (2010).

Table 1
Correlation matrix of all study variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Temperature (50 states)	–	1.0	.59	–.38	–.66	.65	.57	–.39	–.63	–.42	–.68
2. Temperature (48 states) ^a		–	.69	–.13	–.75	.65	.80	–.40	–.76	–.48	–.78
3. % Black			–	–.34	–.50	.57	.62	–.33	–.72	–.26	–.62
4. % Native American				–	–.07	–.15	.15	.13	–.02	–.10	–.02
5. IQ					–	–.55	–.76	.41	.75	.57	.83
6. Religiosity						–	.51	–.62	–.68	–.72	–.83
7. Crime							–	–.26	–.82	–.42	–.78
8. Education								–	.61	.66	.72
9. Health									–	.63	.92
10. Income										–	.81
11. Well-being ^b											–

A correlation of $r = .279$ is significant ($p < .05$) for a directional test.

^a This variable excludes Alaska and Hawaii.

^b This variable is a composite created from principal components analysis on variables 5–10.

Table 2

Partial correlation matrix (controlling for % Black) of all study variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Temperature (50 states)	–	1.0	–.23	–.53	.48	.33	–.27	–.37	–.35	–.50
2. Temperature (48 states) ^a		–	.20	–.60	.44	.65	–.29	–.53	–.45	–.62
3. % Native American			–	–.29	.05	.49	.02	–.39	–.20	–.29
4. IQ				–	–.39	–.66	.32	.65	.57	.77
5. Religiosity					–	.25	–.57	–.49	–.72	–.75
6. Crime						–	–.10	–.69	–.35	–.64
7. Education							–	.59	.63	.70
8. Health								–	.67	.88
9. Income									–	.86
10. Well-being ^b										–

A correlation of $r = .279$ is significant ($p < .05$) for a directional test.^a This variable excludes Alaska and Hawaii.^b This variable is a composite created from principal components analysis on variables 4–9.

3. Results

Mean temperature across the 50 U.S. states was 51.9 °F ($SD = 8.7$). Excluding Alaska and Hawaii, mean temperature was 52.1 ($SD = 7.6$) °F. The mean for percent-Black across the 50 U.S. states was 10.3 ($SD = 9.6$). The mean for percent-Native American was 1.70 ($SD = 3.1$). All other variables reported here are expressed as Z scores.

Table 1 shows univariate correlations for all variables used in these analyses. State temperature robustly predicts every well-being variable, with values ranging from $-.39$ (education) to $-.68$ (global well-being). State IQ correlates $-.66$ with state temperature ($r = -.75$ when excluding Alaska and Hawaii). This value's magnitude is similar to those reported by researchers looking at nation-level temperature and IQ relationships, as reviewed above.

Table 2 shows correlations between all study variables, after partialing out the percentage of state residents who are Black. Relative to Table 1, the correlations are somewhat attenuated. Temperature, however, still predicts all of the well-being variables, either moderately or strongly. Values range from $-.27$ (for education) to $-.53$ (for IQ; $r = -.60$ when Alaska and Hawaii are excluded from analyses). In fact, among all the well-being variables in Table 2, temperature correlates most strongly with state IQ, after controlling for percent-Black (similar conclusions were reached when simultaneously controlling for percent-Black and percent-Native American).

Our final analysis offers insight as to whether the temperature/IQ correlations reported above are spurious. Here, we purposely enter a “kitchen soup” of inter-correlated variables into a hierarchical regression. Our aim is to see whether temperature would survive as a significant predictor of IQ, even after controlling for the host of meaningful variables that co-vary with it. Although this analysis does not get at causality, it does test how robust the correlation is between state temperature and IQ.

At Step 3 in Table 3, only temperature and crime survive as significant (i.e., non-redundant) predictors of IQ. The beta weight for temperature predicting IQ is $-.40$, even after controlling for all the inter-correlated variables comprising the g/well-being nexus (see, e.g., Pesta et al., 2010). In sum, state temperature predicts state IQ, and the explanation for this relationship seems outside the explanatory purview of CWT.

4. Discussion

We offer relatively simple analyses showing that evolution is not necessary for temperature and IQ to co-vary across geographic space. Throughout, we assumed that evolution cannot yet have operated on non-native residents of the 50 U.S. states. Nonetheless, U.S. state temperature correlates strongly with U.S. state IQ. The correlation persists even after controlling for racial composition. Temperature itself also correlates with various state-level measures of well-being.

What explains the pattern of results we found? Pesta, Bertsch, McDaniel, Mahoney, and Poznanski (2012) speculate that founder effects may partly explain why states vary on psychological dimensions. Specifically, both social (e.g., religious beliefs and customs) and genetic (e.g., IQ and personality, in part) factors characterize the settlers of a particular geographic area. Settler characteristics then become the basis for local beliefs and behaviors, which either attract or repel future

Table 3

Hierarchical regression predicting state IQ by race, well-being variables, and temperature.

Variable	B	SE B	β	
Step 1				
% Black	–.165*	.036	–.585*	
% Native American	–.235*	.113	–.268*	
R^2				.56/.31
Step 2				
% Black	.014	.049	.048	
% Native American	.050	.099	.057	
Religion	.036	.437	.013	
Crime	–1.49*	.513	–.549*	
Education	.039	.415	.015	
Health	.486	.747	.179	
Income	.665	.436	.246	
R^2				.81/.66
Step 3				
% Black	–.002	.045	–.006	
% Native American	–.102	.106	–.116	
Religion	.449	.429	.166	
Crime	–1.10*	.495	–.396*	
Education	.122	.384	.045	
Health	.247	.695	.091	
Income	.697	.403	.257	
Temperature	–.124*	.043	–.399*	
R^2				.85/.72

* $p < \alpha$.

residents from assimilating a community's culture. These specific characteristics likely still remain represented genetically and culturally in local populations in a non-random fashion. However, why temperature might co-vary with founder effects remains unknown.

It is also possible that significant historical events (e.g., the U.S. civil war, or various waves of immigration throughout the 19th and 20th centuries) created differential patterns of migration across the United States. Again, how and why these effects would co-vary with state temperature remain unknown. Whatever the explanation for temperature/IQ relationships in the USA, we are aware of no limitations to the present study that prevent us from reaching the following conclusions: though it seems unlikely that CWT can account for the effects reported here, our data do not falsify the theory. Instead, we argue that evolution is not necessary for temperature and IQ (or well-being) to correlate meaningfully across geography.

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