Intelligence 39 (2011) 437–442

Contents lists available at SciVerse ScienceDirect

Intelligence

IQ, skin color, crime, HIV/AIDS, and income in 50 U.S. states

Donald I. Templer [a,1], J. Philippe Rushton [b,*]

[a] Alliant International University, Fresno, CA 93704, United States
[b] Department of Psychology, University of Western Ontario, London, Ontario, Canada

ARTICLE INFO

Article history:
Received 20 July 2010
Received in revised form 9 August 2011
Accepted 9 August 2011
Available online 3 September 2011

Keywords:
IQ
Skin color
Crime
HIV/AIDS
Life history
g nexus
Pigmentocracy
Melanin-based coloration

ABSTRACT

In 50 U.S. states, we found a positive manifold across 11 measures including IQ, skin color, birth rate, infant mortality, life expectancy, HIV/AIDS, violent crime, and state income with the first principal component accounting for 33% of the variance (median factor loading = .34). The correlation with a composite of total violent crime was higher with skin color ($r = .55$), a more biologically influenced variable than with GDP ($r = -.17$), a more culturally influenced variable. These results corroborate and extend those found at the international level using INTERPOL crime statistics and at the county, provincial, and state levels within countries using local statistics. We interpret the cross-cultural consistency from an evolutionary life history perspective in which hierarchically organized traits culminate in a single, heritable, super-factor. Traits need to be genetically organized to meet the trials of life—survival, growth, and reproduction. We discuss brain size and the *g* nexus as central to understand individual and group differences and we highlight melanin and skin color as a potentially important new life history variable.

1. Introduction

In this paper, we confirm and extend research on the *g* nexus of inter-correlated variables found within- and between-nations at aggregate levels. As described by Jensen (1998), the *g* nexus is a network of variables with general mental ability at the center. It has both horizontal and vertical components. The horizontal component includes real-world variables that co-vary and interact with *g*, such as educational achievement, wealth, health, longevity, job performance, and law-abidingness. The vertical component includes presumed causes of individual differences in *g*, with a special focus on biological and neuropsychological variables (i.e., in properties of the human brain), and gene-based evolutionary processes.

In *IQ & Global Inequality*, Lynn and Vanhanen (2006) found that across 192 countries, national IQs correlated with national income (0.68), adult literacy (0.64), enrollment in higher education (0.75), life expectancy (0.77), and democratization (0.57). Construct validity studies have demonstrated these national IQs are reliable and valid. Rindermann (2007) found a positive manifold across the national IQs and tests of educational achievement. Gelade (2008a) and Morse (2008) found the national IQs correlated with scientific productivity measured by articles and technological patents. Gelade (2008b) used spatial statistics to show that geographic neighbors had more similar IQs than nations further apart.

Addressing the fundamental question of the causes of the national differences in intelligence, Lynn and Vanhanen (2006) concluded that they depended on the racial composition of each country's population. Thus, the 6 East Asian countries (China, Japan, South Korea, Taiwan, Hong Kong and Singapore) all had IQs in the range of 105 to 108. The 29 European countries all had IQs in the range of 92 to 102. The 19 countries of sub-Saharan Africa all had IQs in the range of 59 to 73. There was remarkable consistency in the IQs of countries when these were classified into racial clusters.

Both Lynn (1991, 2006) and Rushton (1995) proposed evolutionary explanations for the regional differences, suggesting that

* Corresponding author. Tel.: +1 519 661 3685.
E-mail addresses: donaldtempler@sbcglobal.net (D.I. Templer), rushton@uwo.ca (J.P. Rushton).
[1] Tel.: +1 559 431 1886.

0160-2896/$ – see front matter
doi:10.1016/j.intell.2011.08.001

the populations evolving in colder climates were selected for higher levels of intelligence because the further north the ancestral populations migrated out of Africa, the more they encountered the more cognitively demanding problems of gathering and storing food, gaining shelter, making clothes, and raising children successfully during prolonged winters. In support of the cold winters theory is the 0.62 correlation found between cranial capacities and distance from the equator in 20,000 crania representing 122 ethnically distinguishable populations from every continent (Beals, Smith, & Dodd, 1984).

Templer and Arikawa (2006) found a correlation of −0.92 between skin color and IQ across 129 countries (the darker the skin, the lower the IQ), which they interpreted as additional support for cold winter theory. Templer and Arikawa conceptualized skin color as a multigenerational adaptation of the climate one's ancestors lived in for thousands of years. They took the skin color data from an anthropological world map (Biasutti, 1967). Templer and Arikawa also found national IQ correlated −0.76 with mean high winter temperature and −0.66 with mean low winter temperature. The 129 countries represented the indigenous people who existed prior to 1492, a criterion previously used by Cavalli-Sforza, Menzoni, and Piazza (1994). The negative correlation between IQ and skin color remained even when calculated separately within each of the three continents: Africa, −0.86; Asia, −0.55; and Europe, −0.63.

Subsequently, Templer (2008) examined the relation of skin color and IQ in a test of Life History Theory, which postulates that a single (fast-slow) *r*–*K* continuum "underlies much of the field of personality" (Rushton, 1985, p. 445). Rushton's application of *r*–*K* theory to human differences built on MacArthur and Wilson's (1967) and Wilson's (1975) description of how species colonize islands and become equilibrated. Species genetically inclined to the fast *r*-reproductive strategy produce more offspring but provide less parental care; those with the slow *K*-reproductive strategy produce fewer offspring but provide greater parental care. Pianka (1970) and Wilson (1975) described how *r*- and *K*-strategists differ in family, individual, population, and social system characteristics. *K*-strategists have a slower rate of growth, delayed sexual reproduction, higher encephalization, lower infant mortality, more parental care, and higher altruism. Rushton (1985) cited several animal studies which show that the *r*–*K* continuum also applies to individual differences within species. Research has confirmed many predictions at the individual level (see Templer, 2008, for review). In his analyses, Templer found a *K* super-factor accounted for 75% of the variance across 129 national IQ scores, skin color, birth rate, infant mortality, HIV/AIDS, life expectancy, and GDP (median $r = 0.68$). The life history correlations were higher with skin color (median $r = 0.74$), a more biologically influenced variable, than with income measured by GDP (median $r = 0.57$), a more culturally influenced variable.

Rushton and Templer (2009) examined skin color and IQ in 113 countries along with international crime statistics on murder, rape, and serious assault (taken from the 1993–1996 INTERPOL Yearbooks), life expectancy, birth rate, infant mortality, HIV/AIDS, and GDP. Violent crime was lower in countries with lighter skin color, higher IQ, higher life expectancy, and lower rates of HIV/AIDS, although not with higher GDP. A principal components analysis found the first general factor accounted for 52% of the variance. Moreover, the correlations were significantly higher with skin color, a more biologically influenced variable, than with measures of GDP, a more culturally influenced variable. When the 19 sub-Saharan African countries were excluded from analysis the crime/relation held but the crime/skin color relation did not.

The hypothesis that skin color is a genetic correlate of IQ was endorsed by Jensen (2006) who suggested that pleiotropy (genes having more than one effect) may underlie the relationship. Skin color became of greater theoretical interest after Ducrest, Keller, and Roulin (2008) reviewed the literature and reported that in 20 wild vertebrate species, darker individuals were more aggressive, sexually active, and resistant to stress than lighter individuals. Studied were three mammal species (African lion, soay sheep, and white-tailed deer), four fish species (mosquito fish, guppy, green swordtail, and Arctic charr), four reptile species (asp viper, adder, fence lizard, and spiny lizard), one amphibian species (spadefoot toad) and 36 bird species. Darker individuals also tended to have a larger body mass and greater energy and physical activity such as grooming. Ducrest et al. (2008) confirmed the naturalistic observations using experimental studies such as the administration of melanocortins and the fostering of infants to non-biological parents. For example, the fostering studies found darker maned male lions are more aggressive and sexually more active, and darker barn owls mount stronger immune responses when their biological parents are darker, even though they had been raised by lighter foster parents,

Duchrest et al. (2008) identified pleiotropy in the melanocortin system as determining the pigmentation of the hair, skin, cuticle, feather, and eye, with genetic regulation producing a synthesis of brown to black eumelanin and yellow to reddish-brown pheomelanin. Melanin-based coloration was associated with enhanced fertility, female sexual receptivity, and male sexual motivation and performance as mediated through higher production of sexual steroids including testosterone. The authors cautioned, however, that because of genetic mutations, melanin-based coloration between human populations are not expected to consistently exhibit the physiological and behavioral traits reported for the other species.

In the present study, we examine whether our previous findings on skin color, IQ, and life history variables observed at the international level (Rushton & Templer, 2009; Templer, 2008) can be replicated within the 50 U.S. states. To the extent they can be replicated, the viability of skin color as a life history variable is enhanced. We used the same set of variables as previously: skin color, IQ, birth rate, infant mortality, life expectancy, and rate of HIV/AIDS. In the present study, we measured skin color by the percentage of each state that is Black in the context of the work of Ducrest et al. (2008) who reported darker animals to be more aggressive.

Much research on the *g* nexus has already been carried out in various countries at the state, provincial, and county levels. For example, Lynn (2010b) found that in Italy, a north–south gradient in IQ predicted differences in income, education, infant mortality, stature, and literacy. In the US, McDaniel (2006) found state IQ from standardized tests for reading and math administered to public school children in grades four and eight by the National Assessment of Educational Progress (NAEP) positively correlated with gross state product, health, and government effectiveness and negatively correlated with violent crime ($rs=0.28$, 0.75, 0.34, and −0.58, respectively). Pesta, McDaniel, and Bertsch (2010) used the above variables and others to create an index of well-being for each of the U.S. states from subdomains such as general mental ability, education, economics, religiosity, health, and crime. They found that well-being variables were inter-correlated. A single, general component of well-being emerged that explained between 52 and 85% of the variance in the sub-domains. The global well-being scale correlated 0.83 with state IQ, assessed using McDaniel's (2006) NAEP measures. Reeve and Basalik (2010) found state IQ, state wealth and racial composition predicted state health statistics including HIV/AIDS. At the county level, Beaver and Wright (2011) replicated the association between IQ and crime using data from 243 counties nested within 31 states drawn from the National Longitudinal Study of Adolescent Health, with controls for social disadvantages. Serious crimes such as murder and less serious crimes such as vehicle theft were included.

2. Method

State IQ was taken from McDaniel (2006) who compiled them from NAEP scores in grades four and eight. Other measures were from Pesta et al. (2009) including a state income composite formed from disposable income per capita, percentage of families in poverty, and percentage of individuals in poverty. Life expectancy at birth in 2005 was obtained from Wikipedia (2009). Percentage Black was obtained from the U. S. Census Bureau (2009) Statistical Abstract. HIV/AIDS rates were obtained from the U. S. Center for Disease Control Summary of Notifiable Diseases (2009). Crime rates were obtained from the U. S. Federal Bureau of Investigation (2008).

3. Results

Table 1 contains the mean values for the 11 independent variables for each of the states. Table 2 contains the variable means, standard deviations, and the product–moment correlations between them.

One salient finding in Table 2 is the magnitude of the correlation between HIV/AIDS rate and the crime variables such as the correlations of 0.92 with murder and robbery. Another is the 0.84 correlation between skin color (% Black) and murder. We calculated a composite measure for total violent crime and found the correlation was higher with skin color ($r=.55$), a more biologically influenced variable than with GDP ($r=-.17$), a more culturally influenced variable. A related generalization is that the correlations between the life history variables and crime are in the predicted direction as are the correlations with the percentage Black variable. Another generalization is that the income correlations tend to be lower than the r–K correlations.

An orthogonal factor analysis with varimax rotation was performed on the 11 independent variables. The first principle component had an eigenvalue of 3.6 and accounted for 33% of the variance. Its factor loadings were .93 for HIV/AIDS, .92 for robbery, .75 for murder, .71 for skin color, and −.45 for IQ.

Some of the variables in this study are far from being normally distributed. Kurtosis was 40.76 for HIV/AIDS, 26.39 for murder, and 41.92 for robbery. The highest skewness was 6.12 for HIV/AIDS, 4.38 for murder, and 3.89 for robbery. Therefore, rank–order correlations were also carried out. The differences in the results between r and rho were very small.

4. Discussion

The first factor replicates and extends previous findings showing that diverse variables at the state level can be viewed from within Jensen's (1998)*g* nexus, which includes psychometrically measured intelligence, intelligence as reflected in degree of life success and adaptive behavior, and biological variables. Violent crime has a high loading on the first factor, as do HIV/AIDS, infant mortality, life expectancy, income, and skin color (% Black). The more biological variables such as skin color yielded the highest correlations with violent crime, while income, a social variable, provided the lowest. We suggest this pattern of results is accounted for by evolutionary life history theory in which there is co-variation between reproductive effort, aggressiveness, high fertility, low altruism, and poor social organization.

One criticism of our study is that the estimate of IQ is from McDaniel (2006) and is based on reading and mathematics scores from the NAEP. One reviewer argued there was no evidence that education tests measured *g*. In fact, however, a large body of evidence shows that they do (Jensen, 1998). Also, for example, Frey and Detterman (2004) showed that educational tests such as the Scholastic Assessment Test (SAT) are "mainly a test of *g*" (p. 273). Another criticism is that the statistics we used are problematic given the skews in the data (Hassall & Sherratt, under revision). We dealt with this by also carrying out non-parametric analyses and found similar results. We also note that procedures are standard in this research field as used by other researchers.

The present study supports Templer and Arikawa's (2006) finding that skin color is a human life history variable. In *The global bell curve*, Lynn (2008) showed that in many countries around the world, skin color is the basis of social stratification. In the US there is a racial hierarchy in which Europeans have the highest IQ and earnings and socio-economic status, Hispanics come next, while Blacks do least well. Lynn found similar racial hierarchies in Europe, Africa, Latin America, the Caribbean, Southeast Asia, Australia, and New Zealand. Color stratified societies are sometimes referred to as "pigmentocracies" by anthropologists and sociologists and are explained mainly by the structural consequences of colonialism, discrimination, and prejudice. Lynn (2008), however, attributes their cause to heritable IQ and the cold winter hypothesis that shaped the relation between IQ and skin color.

The IQ/skin color link may be more profoundly connected with evolutionary life history theory than previously considered. Ducrest et al. (2008) showed that darker individuals in 20 wild vertebrate species including fish, reptiles, birds, amphibia, and mammals are more aggressive, sexually active, and resistant to stress than lighter individuals. They also show larger body mass and greater energy and physical activity such as grooming, pigmentation of the hair, skin, cuticle, feather, and eye were related to the adaptive function of melanin-based coloration mediated through higher production of sexual steroids including testosterone. Melanin-based coloration,

Table 1
Scores on 11 independent variables for 50 states in the United States.

State	IQ	Birth rate	Infant mortality	Life expectancy	Skin color (% black)	AIDS	Murder	Rape	Robbery	Assault	Income
Alabama	95.70	14.00	9.40	74.60	26.00	0.09	7.60	34.70	157.60	253.00	82.90
Alaska	99.00	16.20	5.90	78.50	3.50	0.05	4.10	64.30	94.00	489.60	109.20
Arizona	97.40	16.20	6.90	78.20	3.10	0.09	6.30	25.70	149.20	265.90	90.40
Arkansas	97.50	14.60	7.90	75.50	15.70	0.07	5.70	48.90	95.80	353.10	77.10
California	95.50	15.50	5.30	79.70	6.70	0.14	5.80	24.20	188.80	285.00	104.70
Colorado	101.60	14.60	6.40	79.10	3.80	0.07	3.20	42.50	68.10	229.30	117.70
Connecticut	103.10	11.90	5.80	80.10	9.10	0.15	3.50	19.30	111.60	163.50	134.20
Delaware	100.40	14.10	9.00	77.40	19.20	0.20	6.50	41.90	210.50	444.40	112.80
Florida	98.40	13.10	7.20	78.50	14.60	0.22	6.40	32.60	197.90	452.00	101.70
Georgia	98.00	15.90	8.20	76.20	28.70	0.20	6.60	22.00	179.20	270.50	89.90
Hawaii	95.60	14.90	6.50	81.70	1.80	0.06	1.90	28.30	84.30	158.10	109.20
Idaho	101.40	16.70	6.10	78.90	0.40	0.02	1.50	36.20	15.80	175.10	89.70
Illinois	99.90	14.10	7.40	78.10	15.10	0.10	6.10	31.90	186.40	300.90	107.40
Indiana	101.70	14.20	8.00	76.90	8.40	0.05	5.10	27.00	118.10	183.50	98.00
Iowa	103.20	13.70	5.30	79.30	2.10	0.03	2.50	29.60	41.60	210.10	103.40
Kansas	102.80	15.10	7.40	78.00	5.70	0.05	4.00	42.50	60.10	304.00	103.50
Kentucky	99.40	14.00	6.60	75.50	7.30	0.09	4.60	33.00	93.80	164.80	79.80
Louisiana	95.00	15.40	10.10	74.00	32.50	0.20	11.90	27.90	135.90	480.40	75.80
Maine	103.40	10.70	6.90	78.10	0.50	0.03	2.40	28.50	25.30	61.40	97.10
Maryland	99.70	13.90	7.30	78.00	27.90	0.25	8.80	20.00	234.40	365.10	126.30
Massachusetts	104.30	12.10	5.20	79.80	5.40	0.09	2.60	26.70	108.80	310.90	124.00
Michigan	100.50	12.40	7.90	77.70	14.20	0.06	5.40	45.00	129.60	321.50	97.70
Minnesota	103.70	14.20	5.10	80.50	3.50	0.04	2.10	34.60	80.00	146.10	116.10
Mississippi	94.20	15.90	11.40	73.90	36.30	0.12	8.10	30.30	102.60	143.90	64.80
Missouri	101.00	13.90	7.50	76.80	11.20	0.09	7.70	27.30	125.00	344.40	95.30
Montana	103.40	13.00	7.00	77.90	0.30	0.03	2.40	30.40	17.80	207.60	89.80
Nebraska	102.30	15.20	5.60	79.20	4.00	0.05	3.80	32.70	72.80	194.30	104.30
Nevada	96.50	16.10	5.80	76.30	6.80	0.13	6.30	42.40	248.90	426.90	106.70
New Hampshire	104.20	10.80	5.30	79.50	0.70	0.04	1.00	29.70	31.80	94.70	121.60
New Jersey	102.80	13.40	5.20	79.20	13.60	0.13	4.30	12.90	146.30	163.00	128.70
New Mexico	95.70	15.50	6.10	77.70	1.90	0.06	7.20	57.40	109.50	475.90	77.30
New York	100.70	13.10	5.80	79.60	15.90	0.25	4.30	14.40	155.40	216.40	107.70
North Carolina	100.20	14.50	8.80	76.60	21.60	0.11	6.50	24.80	155.40	280.60	89.30
North Dakota	103.80	13.80	6.00	79.80	0.60	0.01	0.50	36.20	11.20	118.60	102.10
Ohio	101.80	13.20	8.30	77.10	11.50	0.06	4.70	38.50	163.00	142.10	96.60
Oklahoma	99.30	15.20	8.10	75.10	7.60	0.07	5.80	40.20	101.10	379.50	86.00
Oregon	101.20	13.20	5.90	78.70	1.60	0.06	2.20	30.50	69.70	154.80	95.20
Pennsylvania	101.50	12.10	7.30	77.70	10.00	0.14	5.60	27.90	151.60	224.80	105.90
Rhode Island	95.50	11.70	6.50	79.20	4.50	0.06	2.80	26.40	83.70	136.70	105.10
South Carolina	98.40	14.30	9.40	75.80	29.50	0.17	6.80	36.30	147.30	539.10	83.20
South Dakota	102.80	15.40	7.20	78.60	0.60	0.02	3.20	53.70	14.90	129.60	98.60
Tennessee	97.70	14.10	8.90	75.30	16.40	0.11	6.60	33.20	173.80	508.90	88.90
Texas	100.00	17.10	6.60	77.60	11.50	0.12	5.60	32.90	155.20	314.10	86.90
Utah	101.30	20.80	5.50	79.50	0.80	0.03	1.40	32.60	51.90	135.80	95.90
Vermont	103.80	10.50	6.50	79.60	0.50	0.01	2.70	20.40	14.30	98.30	103.70
Virginia	101.90	14.10	7.50	78.10	19.60	0.08	4.70	22.60	132.80	132.80	113.70
Washington	101.90	13.80	5.10	79.40	3.20	0.07	2.90	40.10	96.90	191.20	107.90
West Virginia	98.70	12.10	8.10	75.30	3.20	0.04	3.30	20.00	49.00	201.50	75.20
Wisconsin	102.90	13.00	6.60	79.00	5.70	0.04	2.60	19.90	160.40	160.40	106.90
Wyoming	102.40	15.10	6.80	77.80	0.80	0.02	1.90	33.80	16.10	180.20	119.90

therefore may be part of the fast (*r*-strategy) end of the *r*–*K* life history continuum, which is associated with disruptive as opposed to the socially cohesive behavior of the slow life history (*K*-strategy).

Wicherts, Borsboom, and Dolan (2010b) critiqued our evolutionary explanation of national IQ differences by pointing to many possible confounds between the measures and the often poor quality of the data, especially from sub-Saharan Africa, They argued these problems rendered empirical tests of long ago events virtually impossible and concluded an evolutionary basis for national IQs should only be inferred if "very strong prior knowledge of the processes that created the dependencies" existed, and such knowledge is "all but lacking." Nonetheless, when Wicherts et al. (2010b) carried out an analysis of their own across 60 selected countries after excluding low scoring sub-Saharan African countries, they too found national IQs showed correlations with latitude (0.50), fertility (−0.75), child mortality (−0.61), education (0.60), calories per day (0.44), and urbanization (0.52). They also found one dominant principal component explained 65% of the variance across 18 variables. However, Wicherts et al. (2010b) argued that a more plausible (and proximal) explanation for the co-variation was a country's "developmental status."

Table 2
Means, standard deviations, and inter-correlations of all variables.

	M	(SD)	IQ[a]	BR[b]	IM[c]	LE[d]	SC[e]	AIDS[f]	I[g]	M[h]	R[i]	RB[j]	A[k]
IQ[a]	100.23	(2.82)											
Birth rate[b]	14.19	(1.81)	−.35										
Infant mortality[c]	6.99	(1.45)	−.47*	.03									
Life expectancy[d]	77.78	(1.84)	.51**	−.17	−.65**								
Skin color[e]	11.04	(11.86)	−.48**	.12	.41*	−.66**							
AIDS rate[f]	.12	(.21)	−.39*	.07	−.19	−.37*	.74**						
Income[g]	99.96	(15.23)	.54**	−.30	−.60**	.72**	−.28	.07					
Murder[h]	5.16	(4.43)	−.64**	.16	.09	−.61**	.84**	.92**	−.40*				
Rape[i]	32.12	(10.26)	−.14	.35*	.06	−.14	−.16	−.10	−.24	.01			
Robbery[j]	123.54	(109.10)	−.46*	.12	−.09	−.41**	.77**	.92**	.06	.91**	−.09		
Assault[k]	262.39	(134.65)	−.47**	.27	.18	−.50**	.54**	.51**	−.23	.66**	.37*	.62**	

[a] IQ.
[b] Birth rate (per 1000 women aged 15–44) (BR).
[c] Infant mortality (per 1000 births) (IM).
[d] Life expectancy (years) (LE).
[e] Skin color (% black) (SC).
[f] AIDS rate (per 1000) (AIDS).
[g] Income (I).
[h] Murder (M).
[i] Rape (R).
[j] Robbery (RB).
[k] Assult (A).
* $p<.001$.
** $p<.01$.

Lynn (2010a), Rushton (2010), and Templer (2010) responded to Wicherts et al. (2010b), who in turn replied to them (Wicherts, Borsboom, & Dolan, 2010a). For example, Rushton (2010) showed that heritable brain-power played a decisive role in Lynn's *g* nexus, A biological variable such as brain size can break circular reasoning among social–cultural variables. Studies of brain size, including those using MRI, show a correlation of 0.40 with IQ. Substantial population differences exist in brain size that parallel the IQ differences. In average cranial capacity (cm^3), East Asians = 1364; Whites = 1347; and Blacks = 1267. Since every cubic centimeter of brain tissue contains millions of brain cells and billions of synapses, the race differences in brain size help to explain the race differences in IQ. From the brain size data given above on the three populations, Jensen (1998, p. 443) calculated a correlation of 0.998 between their mean IQ and their mean cranial capacity.

Rushton (2010) calculated correlations between brain size and IQ for the 10 "genetic clusters" identified by Cavalli-Sforza et al. (1994) into which Lynn (2006) had grouped his national IQs in order to show the national scores depended on the racial composition of the country, across the 10 groupings, Rushton (2010) calculated a 0.91 correlation between the racial IQ scores given by Lynn, and the cranial capacities given in a collation of 20,000 skulls gathered from around the world by Beals et al. (1984, p. 304, Fig. 3). Rushton (2010) also calculated a 0.83 correlation between cranial capacity and IQ from another data set across the 10 populations provided by Lynn (2006, p. 212, Table 16.2). Any variable such as brain size that explains differences at the non-human level as well as at the level of the individual, nation, and international level, deserves to be taken very seriously (see Rushton & Ankney, 2009, for details on brain size).

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