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Migratory selection for inversely related covariant T-, and IQ-Nexus traits: Testing the IQ/T-Geo-Climatic-Origin theory by the General Trait Covariance model

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ABSTRACT

The IQ/T-Geo-Climatic Origin (GCO) theory admits that primordial northbound migration out of Africa increasingly demanded higher IQ and decreased aggression as temperatures sank. To organisms with a fixed intra-systemic energy budget, this meant that small-brained – High T (Lo-IQ/Hi-T)" masculine aggressive A5 males became too "expensive" in cold eco-niches, and were replaced by Low Testosterone androgyne A1 (Hi-IQ/Lo-T) light-weight males with sufficient energy for developing the large energy-greedy brain needed for survival during cold winters. The physiological re-balancing of T-Nexus and IQ-Nexus traits probably occurred during migration over the past 40,000 years.

The moderate heritability of the traits leads us to expect that rudiments of this evolutionary progression can still be identified in contemporary geographic race and androtype distributions of inversely related T- and IQ-Nexus traits. Rushton's three-racial ranking of Life History traits (Table 1 in Nyborg, this issue,) confirms this, as do analyses using the General Trait Covariance model on data for five races and pentile IQ bands.

The evolutionary progression seems time-limited, however, as recent decennia witness a decaying Western civilization.

1. Introduction

This paper presents the theory that evolutionary progression took place during primordial northbound migration out of Africa, culminating in Western democracy and civilization. To examine it, we tested a basic premise of the General Trait Covariance (GTC) model (Nyborg, 1987, 1994), and then inspected predictions of the IQ/T-Geo-Climatic Origin (GCO) theory.

2. The GTC model

Figure 1 illustrates one of several GTC models.

The model generates testable predictions about harmonized body, brain, intellectual, and personality development based on parental DNA, Testosterone/Estradiol (T/E2) balance, and experience. Optimum brain, intellectual, and personality development depends on low and balanced hormone concentrations, at the cost of sexual differentiation, in accordance with the economy principle (Nyborg, 1994). Conversely, maximum sexual differentiation accompanies high and contrasting T and E2 concentrations, respectively, at the cost of optimum intellectual and personality development – the inverse of Hi-IQ/Lo-T relationships (Nyborg, ibid). The present study focuses on the male side of the model to study evolutionary progressive diversion.

2.1. Testing inverse IQ/T-relationships

The model depicts an inverse relationship between IQ (large brains) and T(low aggression), so we first have to provide empirical support for this.

2.1.1. Data and methods

The large-scale Vietnam Era Study (VES, 1989) provides relevant data for representative groups of non-Hispanic white (N = 3654), Hispanic (N = 200), black (N = 525), Asian (34), and Native (49) middle-aged American males.

The cognitive test battery consists of 19 experimentally independent variables, highly diverse in types of abilities, information content, and cognitive skills. Five of the tests were administered at the time the subjects were inducted into the armed forces; all the others were administered approximately 17 years after induction, on average. The full battery of 19 cognitive tests is described in details by Nyborg and Jensen (2000a,b). Raw scores were subjected to Principal Component (PC) analyses to extract *g*-factor scores and then converting them to IQ metrics.

Plasma T values were determined at on average 38.1 years of age. Blood specimens were taken in the morning before breakfast,

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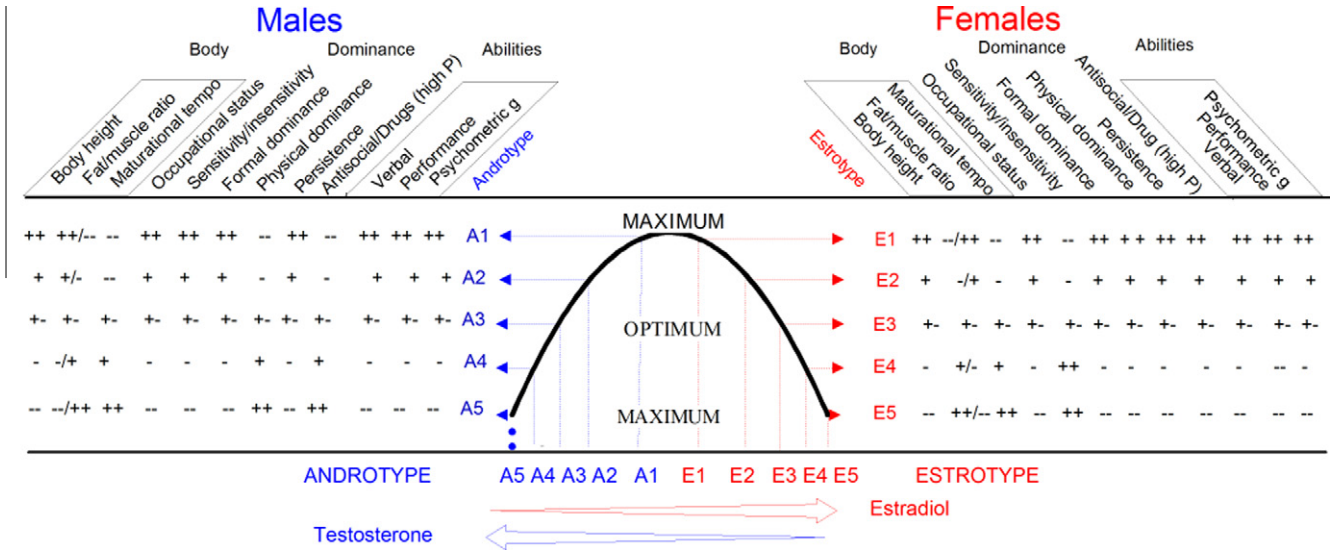

Fig. 1. The General Trait Covariance (GTC) model (Nyborg, 1987; Nyborg, 1994) for inverse relationships among General Intelligence-related traits (g-nexus traits) and Testosterone related traits (T-nexus traits) (Female side of model not considered here).

following an overnight fast commencing at 7 pm. Plasma T concentration was determined (nanograms/deciliter, or n/100 ml) using a standard double antibody radioimmunoassay system (Leeco Diagnostics, Inc.), and monitored with bench and blind repeat quality control procedures. Vietnam and Non-Vietnam veterans did not differ in T concentration, so data were pooled.

Formal education, income in 1985/86 US dollars, 14 MMPI special scale scores and 4 MMPI-derived Eysenckian personality dimensions were also noted.

2.1.2. Problem

Ellis and Nyborg (1992) previously found in the VES material that "Old" black T at age 38.1 was only 3.3% higher than non-Hispanic white T. Even if significant, the difference is small, and a previous study found that young black Americans have 19% higher T than young white males (Ross et al., 1986).

The problem is that T drops differently with age for the races. Table 1 provides racial regressions coefficients for the differential T decline with age between 31 and 49 years.

Black, Hispanic, and white T declines significantly, whereas Asian and Native T does not.

Regression coefficients were used to estimate "Young" T(25)-values from measured Old T(38.1) at mean age 38.1, using the formula in Table 2.

T(38.1) seriously underestimates race differences in T(25) – most for "southernmost" Afro-American blacks, less for "intermediate" Hispanics and "northern" whites, and least for "northernmost" Asians and their Native brothers, who later migrated to the Americas. Linear retro-estimation undoubtedly inflates T(25) values somewhat, but the actual function is not known. The North–South reference implied is based on the fact that skin reflection correlates -0.92 with IQ (Templer, in this issue).

Clearly, studies relying on T(38.1), measured few years before racial slope lines approach each other, will underestimate differences in T(25), as illustrated in Fig. 2.

Interestingly, individual differences in T are about 50% heritable (Hoekstra, Bartels, & Boomsma, 2006), but most race differences in plasma T become negligent at age 40, even if they affect health (Ellis & Nyborg, 1992) and still exist at very old age (Orwoll et al., 2006).

The small Natives and Asians samples (N = 49 and 34, respectively) compromise their IQ means, and Lynn and Vanhanen (2006) suggest that Asian mean IQ is 105. This aberration reduces the true strength of the inverse relationship between T and IQ, but both Pearson and Spearman correlations nevertheless became significant (Table 2).

Table 3 provides average T(25), T(38.1), and mean IQ, as categorized by pentile IQ bands.

T-differences are significant across pentile IQ bands.

Figure 3 shows that T(25) relates inversely and linearly to IQ, whereas T(38.1) only do so for above average IQs.

Having addressed the ***how*** question we may now proceed to examine the ***why*** and ***when*** questions of progressive differentiation in evolution.

Table 1
Regression coefficients used to define Young T values with age 25 T(25) according to the formula 1: T(25) = (age at measurement − 25) ∗ race tilt coefficient + T at time of measurement.

Race	Race regression tilt coefficients	Correlations and level	
Black	$y = 1686.89 - 26.31 * x$	$r = -0.28$ $p < 0.001$	$r^2 = 0.08$
Hispanic	$y = 1348.73 - 17.80 * x$	$r = -0.17$ $p < 0.01$	$r^2 = 0.03$
White	$y = 1243.32 - 15.16 * x$	$r = -0.16$ $p < 0.001$	$r^2 = 0.03$
Asian	$y = 1030.98 - 8.15 * x$	$r = -0.08$ n.s.	$r^2 = 0.01$
Native	$y = 817.36 - 3.78 * x$	$r = -0.05$ n.s.	$r^2 = 0.00$
All	$y = 1296.07 - 16.47 * x$	$r = -0.18$ $p < 0.001$	$r^2 = 0.03$

Note: Thomas Lill Madsen, Tryg Insurance Company, Copenhagen, kindly conceived and performed this analysis, which is gratefully acknowledged.

3. The inverse IQ/T-Geo-Climatic Origin (GCO) theory

GCO theory capitalizes on an idea recently catching momentum (e.g. Kanazava, 2008; Lynn, 1991; Lynn, 2006; Nyborg, 1987; Nyborg 1994; Nyborg, 2012; Rushton, 1995; Rushton, 2000; Templer & Arikawa, 2006) that North-bound migration out of Africa 195.000–40.000 years ago through still colder geo-climatic zones selected for large-brained individuals high in IQ and low in aggression.

3.1. ***Why?***

I previously defined the term "Universal Darwinian selection" as selection at the mass-molecular level for the most economic

Table 2
Retro-estimated Young Testosterone, T(25) at age 25, and measured Old T and Old IQ at age 38.1, by race and sorted by ascending retro-estimated T(25) values.

Race	N	T(25)		T(38.1)		IQ(38.1)	
		Means	SD	Means	SD	Means	SD
Native	49	722.82	255.99	678.06	256.25	97.21	14.54
Asian	34	827.20	254.38	727.71	255.09	100.58	16.44
White	3,654	864.35	227.35	675.96	230.48	102.57	14.02
Hispanic	200	903.75	256.05	680.72	260.01	91.89	12.67
Black	525	1,029.17	238.61	701.43	248.45	84.95	12.32
All Groups	4,321	883.67	237.16	679.59	234.60	100.00	15.00
F =		65.52; $p < 0.001$		1.72; n.s.		196.05; $p < 0.001$	
Pearson r with IQ(38.1)		−0.13; t = −8.56; $p < 0.001$		−0.07; t = -4.61; $p < 0.001$			
Spearman r_s with IQ(38.1)		−0.12; t = −8.00 $p < 0.001$		−0.07; t = -4.32 $p < 0.001$			

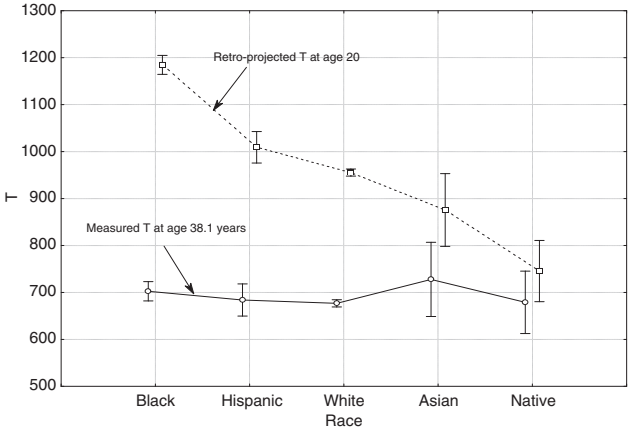

Fig. 2. Mean differences in retro-projected Young and Middle-age plasma testosterone T, according to 2 age- and five race-categories. Overall Wilks lambda = 0.42, $F(8, 8{,}912)$=597.13, $p < 0{,}001$. Univariate Race results: T(25) $F = 65.52$, $p < 0.001$; T(38.1) $F = 1.72$, *n.s.* Vertical bars denote 0.95 confidence intervals.

systems, including the "life" and "death" of organic and inorganic molecular constellations, such as men or stars (Nyborg, 1994, pp. 25–27, chapter 10 and 13) – basically in terms of trade-offs among energy "expenses" within fixed budgets. GCO theory draw upon Universal Darwinian selection to explain ***why*** northbound migration gradually had to alter the intra-systemic energy balance to survive: As temperatures sank, individuals were increasingly subjected to selective pressures working with two suites of inversely related covariant physiological body-, brain- and behavioral traits. Survival depended on a redistribution of energy trade-offs via proximal physiological mechanisms as an obligatory intra-systemic response to increasingly colder environments.

Northbound adaptation thus required a reversal of the original African intra-systemic energy trade-off, so that still less energy became devoted to now maladaptive energy-greedy fetal and pubertal masculinization of body, brain, and behavior, leaving more energy free for developing and maintaining a larger energy-greedy physico-chemical brain. In molecular terms, this translates into a ruthles selection for a larger physico-chemical brain and still lower levels of masculinizing plasma testosterone (T) as migrants went north.

3.2. ***When***

The ***when*** question may be considered in terms of the start-, transitional, and end conditions for northbound migration.

3.2.1. The origin

The origin of Man refers to a long evolutionary process selected for still larger and more efficient brains, but with remaining "room at the top" (Rushton & Rushton, 2004). This linear process probably ran slowly in tropical areas, where a favorable climate made most essential animal and plant food resources readily available year round – aside from periodic severe famine. However, the absence of a collective modern protective law system put evolutionary premium on a strong aggressive physique, capable of conquering and defending territory, food, and females. Moreover, an early maturation and high fertility was required to counter the massive number of lives wasted through devastating tribe fights and an astronomic child mortality rate.

The point is that the African condition provided directive selection for increased brain capacity and IQ-Nexus traits (Jensen, 1998), but relatively speaking stronger selection for T-Nexus traits, such as aggression, reproduction and muscular force. According to the GTC model, the evolutionary outcome is a Lo-IQ/Hi-T A5 male, because simultaneous development of a large brain and a physically strong and aggressive body would have transcended the fixed intra-systemic energy budget (The Economy Principle, Nyborg, 1994, chapter 13). A vestige of this early energy trade-off solution may be relatively strong average African or Afro-American A4–5 phenotypes, still providing advantages in fast energy demanding sports like sprint and boxing, which typically is traded-off by below average IQ and educational achievement (Jensen, 1969,

Table 3
Testosterone by pentile IQ bands.

Pentile IQ band	N	T(25)		T(38.1)		IQ(38.1)	
		Means	SD	Means	SD	Means	SD
Very High	373	832.25	207.63	635.26	211.31	124.42	3.61
High	856	851.27	217.36	658.19	217.88	114.61	2.90
Average	1,944	886.58	234.53	691.85	234.51	100.40	5.65
Low	686	911.79	257.42	695.48	252.56	85.23	2.85
Very Low	462	935.93	259.82	688.00	251.68	73.47	5.09
All Groups	4,321	884.17	237.43	680.46	235.00	100.00	15.00
F=		16.67; $p < 0.001$		7.38; $p < 0.001$			

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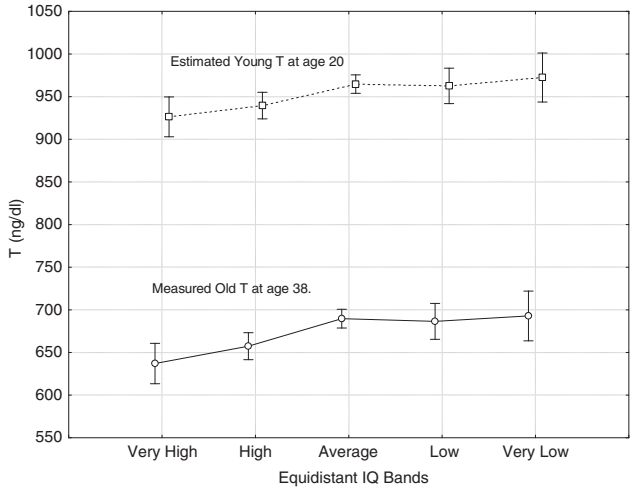

Fig. 3. Mean differences in retro-projected Young and Middle-age plasma testosterone T, according to 2 age- and five pentile IQ bands. Overall Wilks lambda = 0.92, $F(8, 8630)=45.54$, $p < 0.001$. Univariate Race results: T(25) $F = 16.67$, $p < 0.001$; T(38.1) $F = 7.38$, $p < 0.001$. Vertical bars denote 0.95 confidence intervals.

1973). The GTC model demands that covariant IQ-Nexus traits will be inversely related to covariant T-Nexus traits.

3.2.2. The demographic transition

Northbound migratory exodus from Africa gradually altered the IQ-aggression balance. Colder climates generally favor large brains for survival, as migrants has to invent entirely new solutions for coordinated hunting, clothing, housing, and collection and preservation of food during long unforgiving winters. The widespread, sparse and yearly alternating nature of resources made only those survive who readily found and willingly shared food and shelter with kinship. IQ, altruism, low T and reduced aggression became increasingly privileged.

Lynn and Vanhanen (2006) and Lynn (2006) have already demonstrated the significant South–North gradient for IQ, thus providing strong support for GCO theory. Regrettably, supporting evidence for the T-Nexus part is weaker (see later).

3.2.3. The end point

The aggression needed for success in competitive Sub-Saharan Africa became a hindrance in colder areas, where the climate rather called for individual emotional and physical restraint. Sharing and altruism became favored traits, and the later establishments of complex agricultural and industrial cooperatives required and reinforced the trend toward reduced aggression and selfishness. Aggressive fast reproducing migrant became increasingly punished by fellows and by their fixed intra-systemic energy budget, whereas migrants displaying adaptive restraint, altruistic behavior, and capacity for creative-abstract-idealistic solutions to problems in the cold became privileged.

These geo-climatic changes in evolutionary pressures address the ***when*** question.

4. Testing predictions

The most logical way to test the physiologically anchored predictions of the General Trait Covariance model, and the predictions of the IQ/T-Geo-Climatic Origin theory, in terms of evolution, would be to compare African populations with populations at the last stop on the northbound migratory path, namely, in arctic areas and in North-East Asia. Unfortunately, there are no comparative studies of these populations in which hormones, IQ, education, income, personality including altruism, and psychopathology, were measured concurrently. Absent this, the present analysis takes data from the Vietnam Era Study (VES, 1989) and tests model and theoretical predictions for 5 races and pentile IQ bands.

4.1. Testing predictions of the GTC model and the GCO theory

The GTC model and the GCO theory predict trait patterns consistent with Rushton's Life History theory (see Table 1 in Nyborg, in this issue). Inversely related IQ and T-Nexus traits are expected to be distributed along a geo-climatic latitude gradient, with a preponderance of A5s near warm Equator and more A1s situated in cold northern countries.

We thus expect high IQ, low T, long formal education, and formal over physical dominance, high income, emotional sensitivity and persistence, increased altruism and reduced psychopathology in northern Hi-IQ/Lo-T Androtype A1s, and the reverse pattern in southern Hi-T/Lo-IQ A5s.

A1s combine high IQ with low T, low scores on Eysenckian personality dimensions, high "Feminine Values", "Ego Strength" and "Maintain Control" scores in the MMPI, and low "Confusion", "Hypochondria", "Evade Answering", "Schizophrenia", "Depression", "Obsessive–Compulsive", "Social Introversion", "Hypomania" and "Psychopatic Personality" scale scores. The "Paranoia" and "Hysteria" scores did not differ among Androtypes.

The following account, modified from Dahlstrom et al. (1972), illustrates some contrasts contrast between A1s and A5s:

> Lo-T/Hi-IQ Androtype A1 males " ... tend to display feminine values, attitudes and interests, and in styles of expression and speech, as well as in sexual relationships". A1s are " ... sensitive and prone to worry, idealistic and peaceable, sociable and curious, have general aesthetic interests, and are altruistic."
>
> In psychopathological contrast, the Hi-T/Lo-IQ Androtype A5 male " ... tend to display pessimism of outlook on life and the future, feelings of hopelessness and worthlessness, slowing of thought and action, and frequently are preoccupied with death and suicide. He ... reveal[s] neurotic or moderate psychotic reactions or behavioral disturbances that affect test cooperation. He experiences social uneasiness in social situations or in dealing with others, attempt to deny impulses, temptations, and mental aberrations, and show strong self-depreciatory trends."

All this dovetail nicely with Rushton's (Table 1 in Nyborg, in this issue), data on Life history traits, where *K* relate positively to IQ and negatively to T. Table 4 demonstrates that A1s (mostly North-East Asian and non-Hispanic white *K*-strategists, with lesser percentages of other races) also get better educated and earn more than A5s (mostly Africans, but again with lesser percentages of other races).

A1s thus define the culmination of a diversifying evolutionary progression – presaged by GCO theory and illustrated in the GTC model. Importantly, however, androtyping is not race-limited but refers to hormonal continua within and across races.

5. Discussion

The analysis illustrated several points.

IQ and T is inversely correlated across race and pentile IQ bands.

Rushton's racial ordering of 60+ traits (see Nyborg, in this issue, Table 1), includes brain size and dovetails nicely with the A1-A5 continuum as racially categorized geographically anchored aggregated data.

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Table 4
Testing predictions of the GTC model. Aggregated data from the VES (1989) study. Pentile IQ bands are categorical dividers with the inverse IQ/T- relationships implied.

Progressive inverse IQ - T trade-offs during north-bound migration													
	Hi-IQ / Lo-T								Hi-T / Lo-IQ				
Tentative Racial Androtype positioning	Asian		Natives		White		Hispanic		Afro-American.		African Black		
General Androtype	A1		A2		A3		A4		A5		All Groups[4]		
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	N
Pentile IQ bands	124.42	3.61	114.61	2.90	100.40	5.65	85.23	2.85	73.47	5.09	100.00	15.00	4321
Young Testosterone (ng/dl)[1]	921.77	208.47	941.78	218.17	980.83	238.40	1016.27	266.72	1051.97	270.66	981.23	243.24	4321
Formal Education (Yrs.)	15.75	1.94	14.56	2.08	13.13	1.93	13.13	1.90	11.42	1.92	13.30	2.29	4319
Income (1985 US Dollars)	38548	14054	33854	14018	29197	13488	23395	12873	19141	11578	28952	14367	4238
Eysenckian Personality[2]													
Psychoticism (P-scale)	6.38	2.82	6.58	2.80	6.95	3.11	7.80	3.82	8.74	4.54	7.15	3.40	4321
Extraversion (E-scale)	14.10	4.46	14.60	4.48	14.63	4.65	15.21	4.59	15.39	4.23	14.75	4.56	4321
Neuroticism (N-scale)	11.64	4.85	12.39	5.15	13.17	4.84	13.60	5.14	14.09	4.86	13.05	5.00	4321
Social Desirability (L-scale)	7.48	2.32	7.57	2.31	7.94	2.33	8.28	2.57	8.38	2.55	7.93	2.40	4321
MMPI Special Scales[3]													
Ego Strength (ES-scale)	59.49	8.22	57.12	8.65	53.64	9.60	48.49	11.26	44.18	11.87	53.01	10.77	4321
Masculinity-Femininity (MF-scale)	63.41	9.22	61.50	8.99	58.54	9.14	56.20	9.09	54.86	8.71	58.78	9.39	4321
Maintain Control (K-scale)	58.07	8.34	56.59	9.08	53.86	9.18	51.87	9.60	49.60	9.92	53.99	9.54	4321
Confusion (F-scale)	53.64	7.91	54.37	8.08	56.13	9.28	58.88	11.61	62.28	13.61	56.66	10.21	4321
Hypochondria (HS-scale)	52.98	9.25	53.99	10.45	55.77	11.59	59.01	13.75	61.79	16.20	56.33	12.41	4321
Evade Answering (L-scale)	48.57	6.79	49.07	6.26	50.40	7.09	52.19	7.96	53.62	8.57	50.61	7.38	4321
Schizophrenia (SC-scale)	55.92	11.26	56.29	12.52	57.60	13.91	61.66	16.87	65.65	19.26	58.70	14.92	4321
Depression (D-scale)	57.43	10.95	58.49	13.17	60.84	13.67	63.80	15.34	67.40	15.30	61.25	14.10	4321
Obsessive-Compulsive (PT-scale)	55.79	9.46	56.80	11.35	58.70	12.21	61.55	14.11	63.94	14.25	59.08	59.08	4321
Social Introversion (SI-scale	51.49	9.91	52.39	11.20	54.67	10.98	56.30	10.75	57.89	9.74	54.55	10.93	4321
Hypomania (MA-scale)	56.22	9.95	56.16	10.03	57.05	10.97	60.00	11.87	60.78	12.07	57.67	11.10	4321
Psychopatic Personality (PD-scale)	59.22	10.72	59.82	10.89	60.62	11.54	61.67	12.18	61.75	12.55	60.63	11.58	4321
Paranoia (PA-scale)	56.35	8.56	56.30	9.00	56.86	10.17	57.09	11.73	57.90	13.98	56.85	10.57	4321
Hysteria (HY scale)	57.27	7.73	57.75	8.35	57.45	9.08	57.89	10.61	57.95	12.27	57.62	9.49	4321

[a]Estimated values.
[b]Derived ad modum Gentry, Wakefield, and Friedman (1985).
[c]Rank ordered by *F*-value.
[d]All group diff.: $p < 0.001$ except for last two rows; Pearson correlations, *r*s, are all above 0.80 and Spearman r_ss above 0.90 in the aggregated data set. IQ correlates positively with Years of Formal Education, Incom and Ego-, M-F-, and Maintain Control scores, and negatively with the remaining MMPI scores; Testosterone correlations show the exact opposite.

In terms of IQ- and T-Nexae, A1s display the predicted suite of traits characterizing high IQ-Nexus individuals, including altruism, reduced masculinity and low psychopathology. A5s display the opposite suite of traits, including increased psychopathology – as predicted by Rushton (2000).

The analysis suggests that altruism is essentially a high IQ – low T phenomenon, and that the contrasting southernmost A5 type reflects remnants of Sub-Saharan existence long before harsh northern geo-climatic selection took place. A1 is the culmination of harsh selection in the cold.

The retro-calculated significant race differences in young T(25) almost disappear at age 40. Dark-skinned young people have higher T at age 20 than light-skinned individuals, but their T level drops at a faster rate. Given that T is related to crime, the decline might partly, certainly not fully, explain the observed reduction in crime rates with age, and perhaps even better so for blacks.

The obligatory drop in T makes it understandable why older males may act more altruistic and caring than when they were young, reckless, or just careless. The differential T decline rates lead us expect that old blacks and whites would be differentially affected.

The key to understand how the inverse trait covariance Life History trait pattern became established during migration lies arguably in the intra-systemic energy distribution. The modern A1 and ancient A5 types contrast, because prehistoric aggression-related T became selected against, as North-bound migrants proceeded through still colder geo-climatic areas. This left intra-systemic energy free for developing still larger energy-greedy brains, capable in the end of displaying high IQ, altruistic behavior and idealistic attitudes and other traits, not diverted by high T.

Theoretically speaking, androtyping complements Rushton's gene-centered view of the evolution of altruism and other traits, according to which genes for altruism are favored if altruism is directed towards kinship which share the putative genes (i.e. the gene-centered view). GCO theory adds that cold climates favored Lo-T/Hi-IQ A1 altruists via interacting gene-hormone molecular mechanisms during Universal Darwinian assorting. This is conceptualized in the GTC model as a trade-off between an energy-greedy

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aggressive and reproductively hyper-active A5 Androtype and an equally energy-greedy, but physically more restrained altruistic A1, programmed for developing a large brain. A1s and A5s will both obey the dictate of their limited intra-systemic energy budgets. However, there is an important difference. Genetic Similarity Theory assumes genetic similarity for altruistic gene(s), as well as independent selection for genes for T-nexus traits. The GTC model sees altruistic acts as based primarily on IQ and hormonal similarity. One practical consequences of this is that Lo-T A1s generally find Hi-T A5s too loud and physically dominant to share with, irrespective of race, whereas Hi-T A5s find Lo-T A1s too quiet, distant and formally dominant to socialize with. The tentative positioning of races in Table 4 is not intended to exclude that A1-A5 T-altruism contrasts apply cross-racially: A1 Orientals and Blacks may thus find A5 Blacks and Orientals too noisy, whereas A5 Blacks and Orientals may see A1 Blacks and Orientals as too shy, reserved, and difficult to read. A1 blacks and A5 Orientals are just not so common.

More generally, GCO theory maintains that it took at least 40,000 years to single out Northern A1s with large and smart enough brain to survive in cold areas. Today, with the invention of fast, efficient air transportation, it takes less than ten hours to cross many geo-climatic zones without having to pay any cold selection price. Southern A4–5s have recently migrated in numbers to northern A1–2-areas (Coleman, 2006, 2010), and now gradually remodel the infra-structures of the societies shaped by A1–2s sifted through unforgiving Darwinian pressures (Nyborg, 2012). This creates several problems. It has proven difficult to assimilate southern Hi-T/Lo-IQ A4–5s in the modern high-tech northern societies of A1s and A2s. The high heritability for IQ (≈0.8) and moderate heritability for T (≈0.5) reduces the hope that A5s will be able to care for themselves, their families, and become a valuable asset in these complex societies, despite some plasticity. These problems might feed counterproductive racist attitudes on both sides. Even worse, democracy requires national average IQs above 90 and low IQ immigration lowers the national average (Vanhanen, 2009).

Also troubling is that European and North American A1–2s have long suffered fertility rates far below the replacement rate of 2.05, whereas non-Western A4–5 migrants generally display higher rates. A1–2 countries will thus according to projection from 1979 to 2009 data be dominated by A4–5s before the end of this century, a process reinforced by further immigration (Nyborg, 2012). It remains to be seen whether this encounter between predominantly altruistic A1–2s and more aggressive A4–5s will damage general altruism and threatens social cohesion in Western societies, and increase psychopathology rates (Nyborg, in preparation).

Stringer (2011) discussed the emergence of Homo sapiens in Africa, their arrival in Europe and the subsequent extinction of the Neanderthals who migrated from Africa thousands of years before. The GTC model would see the demise of Neanderthals in terms of them being too aggressive and "expensive" for cold areas, compared to more recent lightweight Cromagnon cousins. The energy allocated to covariant T-nexus related traits like aggression, strong muscles and heavy bones, drained energy away from IQ-nexus traits, and made them challenge the economy principle, even if they were equally gifted, or perhaps even smarter, than Cromagnons.

6. Conclusions

Philippe Rushton got his racial rank-ordering of 60+ vital traits for three races right. He did not imply evolutionary progression directly, but GCO theory suggests that A1s and A2s are, in fact, products of such an evolutionary progression.

The flipsides of this evolutionary progression may be that it combines low T and aggression with reduced libido and below replacement fertility. Perhaps, the evolution of northern A1–2s went one bridge too far and exceeded the optimum in the GTC model: Europeans and North American A1–2s seem unwilling - or unfit - to defend their northern territories against more fertile immigration thus implicitly consenting to let A4–5s eventually take over their reduced Western world (Nyborg, 2012).

References

Coleman, D. (2006). Immigration and ethnic change in low-fertility countries: A third demographic transition. *Population and Developmental Review, 32*(3), 401–446.
Coleman, D. (2010). Projections of the ethnic minority populations of the United Kingdom 2006–2056. *Population and Development Review, 36*(3), 441–486.
Dahlstrom et al. (1972). An MMPI handbook (Rev. ed.). *Clinical interpretation: Vol. I*, Minneapolis: University of Minnesota.
Ellis, L., & Nyborg, H. (1992). Racial/ethnic variations in male testosterone levels: A probable contributor to group differences in health. *Steroids, 57*, 72–75.
Gentry, T., Wakefield, J., & Friedman, A. (1985). MMPI scales for measuring Eysenck's personality factors. *Journal of Personality Assessment, 49*, 146–149.
Hoekstra, R. A., Bartels, M., & Boomsma, D. I. (2006). Heritability of testosterone levels in 12-year-old twins and its relation to pubertal development. *Twin Research and Human Genetics, 9*(4), 558–565.
Jensen, A. R. (1969). How much can we boost IQ and scholastic achievement? *Harvard Educational Review, 39*, 1–123.
Jensen, A. R. (1973). *Educability and group differences*. London: Methuen.
Jensen, A. R. (1998). *The g factor: The science of mental ability*. Westport, CT: Praeger.
Kanazava, S. (2008). Temperature and evolutionary novelty as forces behind the evolution of general intelligence. *Intelligence, 36*, 99–108.
Lynn, R. (1991). The evolution of racial differences in intelligence. *The Mankind Quarterly, 32*, 99–121.
Lynn, R. (2006). *Race differences in intelligence. An evolutionary analysis*. Augusta, GA: Washington Summit Publishers.
Lynn, R., & Vanhanen, T. (2006). *IQ and the wealth of nations*. Westport, CT: Praeger.
Nyborg, H. (1987). Covariant trait development across species, races and within individuals. *Paper presented in symposium 6: Biology/Genetics, at the Third meeting of the International Society for the Study of Individual Differences*, June 18–22nd (p. 29). Toronto, Canada, [Abstract].
Nyborg, H. (1994). *Hormones, sex, and society: The science of physicology*. Westport, CT: Praeger.
Nyborg, H. (2012). The decay of Western civilization: double reversed Darwinian selection. *Personality and Individual Differences, 53*(2), 118–125.
Nyborg, H. (in prep). Formation and demolition of Western civilization: The impact of temperature and migration on people, society, democracy, and civilization.
Nyborg, H., & Jensen, A. R. (2000a). Testosterone levels as modifiers of psychometric *g*. *Personality and Individual Differences, 28*, 601–607.
Nyborg, H., & Jensen, A. R. (2000b). The Black–White differences on various psychometric tests: Spearman's hypothesis tested on American Armed services veterans. *Personality and Individual Differences, 28*, 593–599.
Nyborg, H. (this issue). *In conversation with J. Philippe Rushton*.
Orwoll, E., Lambert, L. C., Marshall, L. M., Phipps, K., Blank, J., Barrett-Connor, E., et al. (2006). Testosterone and Estradiol among older men. *The Journal of Clinical Endocrinology & Metabolism, 91*(4), 1336–1344.
Ross, R., Bernstein, L., Judd, H., Hanisch, R., Pike, M., & Henderson, B. (1986). Serum testosterone levels in healthy young black and white men. *J. Natl. Cancer Inst., 76*, 45–48.
Rushton, J. P. (1995). *Race, evolution, and behavior: A life history perspective*. New Brunswick, NJ: Transaction.
Rushton, J. P. (2000). *Race, evolution and behavior* (third ed.). Port Huron, MI: Charles Darwin Research Institute.
Rushton, J. P., & Rushton, E. W. (2004). Progressive changes in brain size and musculo-skeletal traits in seven hominoid populations. *Human Evolution, 19*(3), 173–196.
Stringer, G. (2011). *Origin of our Species*. London: Allen Lane.
Templer, D. I., & Arikawa, H. (2006). Temperature, skin color, per capita income, and IQ: An international perspective. *Intelligence, 34*, 121–139.
Templer, D. (this issue). *Rushton: The great theoretician and his contribution to personality*.
Vanhanen, T. (2009). *The limits to democratization*. Augusts, GA: Washington Summit Publishers.
Vietnam Era Study VES, (1989). *Health Status of Vietnam veterans*, Vol. IV, (pp 67–94). Atlanta, GA: Centers for Disease Control. [Chapter 5]

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