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Short Communication

Evolution, brain size, and the national IQ of peoples around 3000 years B.C

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ABSTRACT

In this rejoinder, we respond to comments by Lynn, Rushton, and Templer on our previous paper in which we criticized the use of national IQs in studies of evolutionary theories of race differences in intelligence. We reiterate that because of the Flynn Effect and psychometric issues, national IQs cannot be taken to reflect populations' levels of *g* as fixed since the last ice age. We argue that the socio-cultural achievements of peoples of Mesopotamia and Egypt in 3000 B.C. stand in stark contrast to the current low level of national IQ of peoples of Iraq and Egypt and that these ancient achievements appear to contradict evolutionary accounts of differences in national IQ. We argue that race differences in brain size, even if these were entirely of genetic origin, leave unexplained 91–95% of the black-white IQ gap. We highlight additional problems with hypotheses raised by Rushton and Templer. National IQs cannot be viewed solely in evolutionary terms but should be considered in light of global differences in socio-economic development, the causes of which are unknown.

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1. Introduction

In our previous paper (this issue), we criticized Kanazawa (2008), Templer (2008), and Templer and Arikawa (2006) on the basis of the fact that these studies were concerned with evolution but ignored changes over the course of evolution in the variables of interest. Our central point was that the use of national IQs in studies of the evolution of intelligence is problematic because national IQs have not been constant over the course of the twentieth century (Flynn, 2007) and so cannot be taken simply to reflect the level of general intelligence or *g* of peoples that lived thousands of years ago. We showed that current-day national IQs are strongly confounded with the developmental status of countries and argued that it is rather likely that the Flynn Effect is not at the same level of development across the globe. We are delighted to have a chance to discuss our work with Drs. Lynn, Rushton, and Templer and thank them for their comments.

Lynn (this issue) dismissed the Flynn Effect as relevant for the study of the evolution of race differences in intelligence and asserted that these differences have been constant over the course of millennia. Rushton (this issue) discussed neither the Flynn Effect nor any potential trends in life-history traits, but rather raised the possibility that race differences in brain size may explain global differences in IQ and development. Templer (this issue) claimed that we failed to appreciate the big picture of evolution painted

by Lynn and Rushton. In light of space limitations, we discuss here neither the validity of Lynn and Vanhanen's national IQ estimates (see Wicherts, Dolan, & van der Maas, *in press*) nor several additional lines of evidence discussed by the commentators. It is noteworthy that the commentators have expressed hardly any arguments against our main assertion that national IQs cannot be used to test evolutionary theories without a consideration of relevant confounds. The use of national IQs in the study of evolution assumes that the level of *g* of peoples are constant over time, which they do not appear to be.

2. IQ avant la lettre

We doubt strongly whether western IQ tests have the same substantive meaning across the globe. Templer claimed that the construct validity of national IQs is supported by their correlation with means in national scholastic achievement surveys. However, such ecological correlations do not warrant conclusions concerning the measurement invariance of IQ tests across national groups. For instance, national IQs also correlate about $|.85|$ with fertility rate, but this does not mean that IQs can be taken to measure the number of offspring of individuals. It is completely unclear whether national IQs reflect differences between contemporary populations in terms of the average level of *g* (Wicherts *et al.*, *in press*). Because the Flynn Effect does not appear to be explainable in terms of *g* (Rushton, 2000; Wicherts *et al.*, 2004), it is even doubtful whether the current-day IQ levels of populations reflect the average level of *g* of these populations a couple of decades ago. Because the content of IQ tests is typically from the twentieth century, it is even more

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doubtful that national IQs can be projected back to our ancestors who lived 5000 years ago.

Lynn and Vanhanen's (2006) data may suggest that the Dutch currently outperform the Egyptians by 19 IQ points (100 versus 81) and the Iraqi by 16 points, but this cannot be taken as evidence for the claim that the peoples who populated areas close to the Netherlands in 3000 B.C. were more intelligent than the peoples who constructed the Pyramids of Cheops or who developed the first civilizations in Mesopotamia. On the contrary: suppose that the average IQ "avant la lettre" of ancient populations can be gauged by the ability to build buildings that last for millennia, to develop scripture, arithmetic, astronomy, and art, and to successfully administrate an empire. In terms of these indicators of IQ "avant la lettre" of peoples, the average intelligence of peoples living in areas corresponding to present European countries in 3000 B.C., will turn out to be relatively low (i.e., these peoples did not evidence many of these abilities), while the average intelligence of Egyptian and Mesopotamian peoples will turn out high. This appears to contradict the evolutionary theories by Lynn, Rushton, and Kanazawa, because Egypt and Mesopotamia are relatively warm and quite close to the ancestral environment.

Lynn (this issue) asserts that present Africans have hardly satisfied Baker's (1974) criteria for a civilization, but this applies equally to inhabitants of present day Europe around 3000 B.C. More importantly, the ancestors of the peoples who laid much of the groundwork for western civilization now have average IQs around 82 (Lynn & Vanhanen, 2006). Contemporary Africans average IQs around the same level (Wicherts et al., *in press*), so the supposed low level of IQ of Africans should not be cause for concern that they lack the necessary intelligence to do so.

3. Brain size

Rushton (this issue) claims that global differences in IQ and development can be explained in terms of (race) differences in brain size. Rushton (2000) has gone to great lengths to show that race groups differ on average in terms of brain size, with Whites averaging 1347 cm³ and Blacks averaging 1267 cm³. The mean difference may appear impressive, but it is virtually meaningless without knowledge of the typical spread of brain size within populations, which is around SD = 130 cm³. So the Black-White difference in brain size is approximately $80/130 \approx .6$ SD units. Rushton's figures are based not on contemporary MRI measurements of white and gray matter volume, but rather on outdated external or postmortem cranial measurements. Given the correlation between cranial capacity as measured externally and intelligence of around .20 (Rushton & Ankney, 2009), the Black-White gap in brain size cannot explain much of the IQ gap. Even if cranial capacity had a causal effect on *g*, then the Black-White gap in brain size cannot explain more than: $.6 \cdot .2 \cdot 15 = 1.8$ IQ points. If we were to believe that the IQ gap between Africans and European Whites is 33 IQ points (Lynn & Vanhanen, 2006), then the brain size gap could explain a staggering $1.8/33 = 5\%$ of the IQ gap. Thus, even under these terms, 95% of the IQ gap is left unexplained by brain size. With a correlation of .33 between brain volume and IQ as based on modern techniques (McDaniel, 2005), the gap in brain size can explain only 2.98 IQ points or 9% of the IQ gap. However, we are not familiar with studies that used modern methods to measure brain size in both European Whites and Africans, and we are not familiar with any studies of the heritability of IQ and/or brain size among Africans. Although race differences in brain size are in line with Rushton's hypothesis, his hypothesis fails to impress us. The gap in brain size is much too small to explain the IQ gap, there is no indication of whether the (genetic) relation between brain size and IQ holds for African Americans or Africans, the causal relation itself is

a matter of opinion and further research, and there is no reason to suppose that the race gap is environmentally insensitive, as Rushton and Ankney (2009) acknowledge. Another problem with the brain size hypothesis lies with the fact that sex differences in brain size are larger than race differences, yet studies involving representative samples, broad cognitive test batteries, and sound statistical methods consistently fail to show a clear sex difference in *g* (Dolan et al., 2006; Keith, Reynolds, Patel, & Ridley, 2008; Van der Sluis et al., 2006).

4. The Big picture

Templer (this issue) asserts that we fail to see the "big picture [...] that Blacks average a lower IQ and all that goes with it and are prone to HIV/AIDS". According to Templer, this may be due to higher levels of testosterone among Blacks. Testosterone is hypothesized to affect many r-K characteristics and to underlie sex differences in longevity. This is an interesting hypothesis, but it does not appear to fit empirical data. For instance, on average males have higher levels of testosterone than females, yet they have larger brain sizes (Rushton & Ankney, 2009) and they do not live longer than females. Also, we are not familiar with empirical support of a link between 2D:4D ratio and total IQ.

Templer stresses the conceptual similarities between theories by Lynn, Rushton, and Kanazawa. This is an interesting assertion because Kanazawa and Rushton have opposing views on why Africans have evolved lower intelligence. Kanazawa (2004) explains the low intelligence of Africans by claiming that the ancestral environment of subtropical savannahs was very stable and predictable and hence required little intelligence to survive in. Rushton (2000), however, reasoned that "predictable environments are an ecological precondition for K-selection [and that] subtropical savannahs [...] are generally less predictable" (p. 231). Kanazawa's (2008) study is flawed because it claimed support for two opposing accounts.

Templer claims that the "potential of national IQs as explanatory variables" is demonstrated by correlations of national IQ with variables like GDP, adult literacy, and life expectancy. A glance at the correlation matrix in our primary paper shows that other variables associated with development have the same explanatory power as national IQ. For instance, the correlations reported by Templer (2008) are easily replicated by replacing national IQ with Proteins g/day/capita, child mortality rate, or secondary school attendance. This means that these variables have just as much explanatory power as does national IQ. Templer claims that we fail to see the forest for the trees, but he appears to be staring only at global differences in IQ and development from the perspective of the evolutionary accounts to which he subscribes. Evolutionary accounts of race differences in intelligence are easy to formulate. The plausibility of such accounts depends on the empirical support for specific predictions, and the exclusion of competing accounts. The ecological correlations involving national IQ are open to many interpretations. Templer's big picture strikes us as a one-sided view on the nature of global differences in IQ, health, and development.

5. Conclusion

Templer and Rushton hardly discussed the relevance of temporal changes in the variables of interest, although Templer did express his doubt that the Flynn Effect is possible in Africa. Lynn claims that the Flynn Effect matters little because of global differences in brain size and the development of civilization. Rushton claims that differences in brain size underlie global differences in development and IQ. We are not impressed by their arguments.

Differences in brain size could explain only a fraction of the IQ gap. Current levels of development vary greatly across the globe, but these differences are of fairly recent origin on an evolutionary time scale. Both average IQs and many of Rushton's life-history traits have shown trends over the course of history, and rigorous studies should not ignore such trends.

We do not dismiss the possibility that g plays a role in global differences in development. However, there is little support for the notion that national IQs accurately reflect levels of g across the globe. Moreover, the Flynn Effect has shown unambiguously that societal development has a strong impact on IQ levels of populations. Variables such as education, health, nutrition, and urbanization are hypothesized to have played a role in these trends and currently show global differences. The question then becomes: what is the temporal order of events? Lynn and Vanhanen (2006) wrote that "national differences in the average intelligence, as a consequence of evolution, emerged long before the contemporary social conditions reflecting the quality of human conditions" (p. 134). In other words, the order of causality is inferred on the basis of the evolutionary account. In turn, the support for this evolutionary account is based on data of national IQ in which differences in the quality of human conditions are simply ignored. This line of argument is obviously problematic. Evolutionary studies should not take national IQs to be fixed characteristics of populations without a consideration of alternative accounts of global differences in development. Understanding global differences in development and IQ will not be advanced by one-sided interpretations based on evolutionary just-so stories.

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