PANDORA'S BOX AND THE ESKIMO'S NOSE

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Racial differences in IQ-type test scores have been of interest to psychologists for many decades. For those involved in this area of research the main aim has been to find an explanation for the differences. The first paper by Lynn takes a rather novel line to support a genetic explanation. It purports to present evidence to indicate that black-white IQ test score differences might in part be due to group differences in the speed or efficiency of elementary cognitive abilities. It is suggested that these abilities reflect neuronal efficiency, i.e. that they offer an insight into the 'biological' bases of the test score variance. Since this is the corner of intelligence research with which I am familiar I will concentrate on this aspect of the paper.

Early on in his first paper Lynn states that, "...recent work has shown that reaction times are a measure of intelligence and appear to represent differences in the neurological efficiency of brain processes." A perusal of more up-to-date research than is cited to support these claims (e.g. Longstreth, 1984; Jensen and Vernon, 1986; Welford, 1986; Lawson and Saccuzzo, 1986; Kranzler, Whang and Jensen, 1988; Widaman and Carlson, 1989; Neubauer, 1990) would reveal that the strongest comment which it is reasonable to make is that measures of choice reaction time (often using the Hick procedure) are replicable but weak correlates of IQ scores. The correlations are usually in the region of 0.2. To state that RT indices are a measure of intelligence implies that they have similar validity characteristics to IQ test scores, a claim which is unsustainable. The most one should claim is that RT indices share a very modest amount of variance with IQ test scores. Nevertheless, this fact is interesting enough to warrant further research because it raises the possibility that the two measures share cognitive processes. In fact, Lynn does put forward the view that some processes contributing to RT variance underlie IQ test score variance. This is certainly a reasonable hypothesis, but one should acknowledge that there is an alternative view which envisages RT differences as a consequence rather than a cause of IQ scores, a possibility which, if correct, would substantially reduce their importance in the

present discussion (see Mackintosh, 1986; Howe 1988; Ceci 1990 for expositions of this view).

On the second claim in the above quote from Lynn, this is no more than a very speculative hypothesis. Quite what the relationship is between RT and neuronal processing is unknown. The analysis of reaction times extends from the subtraction work of Donders in the mid-nineteenth century to the mathematical modelling of Luce (1986) and Laming (1988), and attempts to discover the evoked potential correlates of reaction time. Even after consideration of these different areas one would be in advance of the evidence in making definite claims about the brain processes which support RT performance and contribute to its variance.

Lynn states that a demonstration of racial differences in RT would rule out many social and environmental explanations for racial differences in intelligence. Would it? Because RT indices are such poor correlates of IQ test scores one could achieve almost any result across the races without seriously damaging either a genetic or environmental explanation of racial differences in ability test scores. If blacks were slow on RT it could mean that they had lower performance on the non-IQ related parts of RT variance (96% of it!). Without some form of causal modelling, as opposed to simple group comparisons, the RT indices are at best very tenuous circumstantial evidence for his hypothesis, and there still remains the body of opinion which hypothesizes that the social and environmental pressures which affect IQ test performance might also affect RT performance (Howe, 1988). However unconvincing this latter hypothesis is, it should be addressed.

The inclusion of a section on civilization advancement is unwise, because it takes the paper out of the realms of the already problematical empirical evidence to the regions of rhetoric, one-off phenomena and historical analysis. By definition, any species or group which survives has been successful in the evolutionary struggle. Rushton's (1988) recent work on r/K strategies has attempted to describe how the success of different human races has been achieved by different degrees of trade-off between what amounts to sexual restraint and high intelligence versus lower intelligence and reproductive productivity. The standard of evidence gathered by Rushton has convinced very few, if any, scientists in the relevant areas of research (see Zuckerman and Brody, 1988). To suppose that the approach used by Lynn, i.e. analyzing whether some forms of human social organization were the products of higher mean group intelligence using the metric of the sporadic production of the occasional genius, will be more successful is naive. The area of behavioral ecology is a notoriously difficult one in which to construct and test hypotheses. After

a long list of pitfalls for the unwary theorist, Clutton-Brock and Harvey (1984) warn that, "Associations between ecological parameters are commonly responsible for correlations which have no causal basis, while it is often the case that several different functional hypotheses predict the same correlations between behavioral and ecological traits."

The review based on Table 1 might well be used to demonstrate the near-impossibility of comparing studies in this compilation and to wonder whether it will ever prove possible to conduct well-designed studies using adequately-matched population samples and cross-culturally compatible tests. Those who are tempted to try to make something intelligible from the imperfect studies here would do well to consider how they might select suitable subjects and tests for such a study. This sense of the difficulty of the enterprise is heightened by Lynn's use of ad-hoc accounts of the results which are discrepant, e.g. the Spanish studies and the differences between Indians in India and in the U.K. "Mongoloids tend to be late maturers," is used to explain the low IQ of young Japanese children. But if IQ test scores have a physiological basis it is difficult to envisage how Mongoloids would underperform when compared with their Caucasoid counterparts at the ages mentioned. What CNS developmental delay mechanisms are proposed? Is there evidence from, for instance, electroencephalographic studies to support this delayed maturation hypothesis?

It is surprising that Lynn denotes the report by Fick (1929) as a "good study." Whereas the degree to which under-education, social disadvantage generally and prejudice contribute to the relatively low IQ test scores of modern day blacks in the U.S.A. might be disputable, one is immediately sympathetic to the notion that blacks in South Africa in 1929 would be seriously disadvantaged on tests and that their scores relative to whites would be likely to reflect many sources of environmental poverty and social repression. Their relative lack of formal education, the social disadvantage and poor nutrition at that time, not to mention unfamiliarity with test-taking and motivational factors, make this unlikely to be a worthwhile study. Knowing, from reading the work of Flynn (1987), the detailed scrutiny that is needed to extract passably meaningful results from cross-national research, few of the studies gathered by Lynn are reported in much depth, and the mixture of occasional study details and some very general assumptions and post-hoc explanations is unconvincing.

Moving on to the section in the first paper which deals with reaction time differences across races, it is not just extreme malnutrition which affects RT indices. RT may be slowed by quite moderate doses of alcohol (of course, it recovers) (Rabbitt, 1988). We have measured median and

standard deviation of RT using the Jensen-type device (similar to that used by Lynn) and have shown that a history of just five severe hypoglycemic episodes over several years in diabetic subjects will affect the brain sufficiently to cause a significant slowing of decision time and an increase in standard deviation, i.e. changes in those RT parameters that are most closely related to IQ test scores (Langan, Deary, Hepburn & Frier, in press). Performance IQ is lowered slightly also, but not verbal IQ. Therefore, quite infrequent, moderate insults to the brain can slow reaction times, which certainly leaves open an environmental (albeit biological) explanation for possible race differences in RT indices. The summary paragraph which asserts that there is a widely accepted explanation for the correlation between RT and IQ test scores glosses over much debate in the literature (see above). Explanations for the correlation are speculative, on both the reductionist side (where processes involved in RT performance are thought to underlie intelligence differences) and on the strategy side of the argument (where fast RTs are seen a consequence of high IQs).

Of Lynn's own RT work that is relevant to the hypotheses here, little detail is given, although the results appear to be in line with his expectations. Later he supports his findings with reference to the RT work of Vernon. Readers should consult Vernon's work to see that Vernon's RTs are not straightforwardly comparable with those of Lynn. Vernon tends to use a conglomerate of so-called RTs which are, in fact, the speeds of yes/no responses to, in some instances, quite difficult, and certainly IQ-like, questions. If one loads RT tasks with cognitively difficult questions then shared variance (genetic and/or environmental) becomes less surprising. The interest of the low correlation between RT indices and IQ test scores lies in the fact that IQ responses appear to be so far removed from the relatively non-cognitive demands of the Hick RT.

It is appropriate to leave the sociologists, anthropologists, paleontologists, etc. to criticize the rest of the first paper and most of the second paper. There are a few points on which I should like to register some doubt. Baker's criterion 13 for the achievements of civilizations does not stand up well to what we know about the treatment of people in recent conflicts by representatives of *all* of the major racial groups mentioned by Lynn. Lynn mentions the work of Pickford in support of his evolutionary account of the racial differences in IQ test scores. But Pickford (1988) has made two other comments which do not necessarily support Lynn's speculation. First, Pickford suggests that human evolution may have stopped for non-verbal intelligence about 0.5 to one million years ago. Does this accord with the climatic evidence? Second, even where Pickford

is willing to allow that climatic changes do drive evolution, including the evolution of behavior, the examples he mentions do not always support Lynn's ideas. It is clear from Pickford's account of man's struggle to survive in semi-arid climates that the effort involved in finding so-called 'cryptic food supplies' needed a considerable level of what most of us might be happy to call intelligence. Cold climates are not the only testing climates. Last, when Lynn discusses evolutionary selection pressures that might increase intelligence I suspect he often means the form of intelligence which Jerison (1988) would be more likely to call encephalisation. I am not aware of studies demonstrating differences across the major human races on this variable and its relation to IQ test scores is, necessarily, even more obscure.

Another review of the thorny issue which Lynn deals with in the first paper may be judged worthwhile if there is a wealth of convincing new evidence, or a Flynn-like (1987) fine-toothcombing of the past evidence. Neither of these objectives is achieved. Therefore, the Pandora's box has been opened once more, some may say, to no great purpose. What of Lynn's evolutionary account of the origins of intelligence test score differences between groups? It puts me in mind of Kipling's *Just So* stories. When one is more used to examining factor analyses or anova tables the type of evolutionary evidence that is offered here is difficult to evaluate. One suspects that there is an infinite number of more or less plausible historical accounts of the causes of racial differences in IQ test scores, and that all would leave aside uncomfortable facts (like the intelligence needed to exist in hot arid climates). The issue addressed in Lynn's first paper is difficult enough, but the evidence is far too sparse to be telling the story of how the eskimo got his/her flat nose.

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REPLY TO COMMENTARIES ON RACIAL DIFFERENCES INTELLIGENCE

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The seven commentators on my two papers on racial differences in intelligence split about equally into the four (Eysenck, Miller, Weiss and Lehrl, Frank and Papp) who accepted the thesis in general terms and elaborated or suggested modifications to a number of points, and the three (Deary, Juhel and Vancata) who were unsympathetic to the papers and raised various objections. Before answering the commentaries it may be useful to summarize the eight principal points made in my two papers.

My two papers on racial differences in intelligence were concerned to set out the evidence on a worldwide basis and to advance a theory to explain how the differences have evolved. The papers argued eight principal points.

1. In relation to a mean IQ of approximately 100 (and standard deviation of 15) for Caucasoids in Europe, North America and Australasia, Mongoloids typically obtain mean IQs in the range of 97-110, south east Asians 80-95, Amerindians 70-90, Negroids 65-81, and Negroid-Caucasoid hybrids 81-94.

2. The three major races show the same differences in reaction times as they do in intelligence, suggesting a neurological basis to the differences.

3. The mean IQs of the races are also associated with their achievements in the development of civilization during the last 5,000 years.

4. Mongoloids and Amerindians have a different pattern of intelligence from Caucasoids and Negroids, consisting of strong visuospatial abilities and weak verbal abilities.

5. The consistency of the races' levels and patterns of intelligence, found in a variety of geographical locations and over 5,000 years of history,