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IQ and global inequality, Richard Lynn, Tatu Vanhanen, Washington Summit Publishers, Augusta, GA(2006). (Pp. xx+400), ISBN:978-1-59368-025-1 (hard cover) 978-1-59368-024-4 (paperback)

Contentious debates arise in scientific literatures when one researcher makes an assertion that goes counter to another researcher's strongly held belief. Contentious scientific debates are interesting for two reasons. First, contentious debates often concern an important topic in science and/or society. Journals seldom devote space for contentious debates on topics of minor importance. Second, contentious debates often result in a flurry of additional research as the adversaries gather evidence to support their own positions. The results of the research flurry often favor one side more so than the other and thus knowledge is gained, more predictive theories gain prominence and weaker theories fade away. As one who enjoys contentious debates, I know that there are few topics more contentious than an examination of the intersection of intelligence, race, and inequality. Thus, I accepted the offer to review *IQ and Global Inequality* by Richard Lynn and Tatu Vanhanen. (2006).

This 2006 book is an extension of the research program addressed in the authors' 2002 book, *IQ and the Wealth of Nations*. The 2006 book provides IQ estimates from more countries than had been available in the 2002 book. It also addresses the criticisms of the 2002 book. The book also expands our knowledge of IQ correlates to a variety of social variables including adult literacy, enrolment in tertiary education, and life expectancy. Thus, the book provides a summary review of the major data sources assessing human equality across countries. Because summaries of the book are readily available from the publisher and others (Rushton, 2006), this review focuses on the key question raised about national IQ estimates: Are the national IQ estimates credible?

An evaluation of the accuracy of national IQ estimates must center on the adequacy of the IQ tests used as measures

of intelligence, the extent to which data are reported accurately, and the extent to which the IQ data gathered in a country are representative of the country's residents. I will address each of these issues in turn.

There are critics of IQ tests who argue that IQ tests do not measure IQ for residents of cultures that differ from the culture of the test developers. This is an old debate. Often the critics of the national IQ estimates make anecdotal arguments that do not rely on an empirical base. For example, Barnett and Williams (2004) stated, without empirical support, that the questions in IQ tests need to be adapted for countries with different cultures from that in which the test was developed. Sternberg (2004) has presented a more sophisticated, but similar, argument. From my perspective, it appears that Lynn and Vanhanen have been careful to select appropriate IQ tests that are suitable for the populations tested. Critics of the Lynn and Vanhanen data should provide empirical evidence in support of their assertions that the IQ tests are inappropriate. While continued research on estimating national IQ through a variety of tests is encouraged, and while some of that research would likely result in changes in national IQ estimates, I do not anticipate this having any great effect on the accuracy of the national IQ estimates or their correlations with other variables. Precise estimates of IQ may not be needed to establish the relationship of IQ with other variables (Whetzel & McDaniel, 2006). Those who disagree with this position are encouraged to collect their own national IQ data on their preferred tests and seek to rebut this position empirically.

The second issue concerns whether the IQ data used in making the national IQ estimates have been reported accurately. All are likely to agree that data errors, if they exist, should be identified and corrected. However, there is no evidence showing that small errors in these data have affected any conclusions. Because even small errors can be used by adversaries to attack research programs, Lynn and Vanhanen may wish to address identified data errors and correct any errors in future editions of the book or in future presentations of national IQ data.

The third issue concerns the extent to which the IQ data are representative of the country's population. Nationally representative samples of IQ data are hard to come by and Lynn and Vanhanen have used such samples when available. However, most of the national IQ estimates are based on convenience samples composed of individuals who were available for a study. Convenience samples abound in science. For example, much psychological research is based on samples drawn from college students in psychology classes. Convenience samples are not necessarily unrepresentative of the population, but they can be. Lynn and Vanhanen were aware of the potential limitations of the convenience samples and provided a variety of data in support of the appropriateness of their samples for estimating IQ. These analyses are reviewed and critiqued below.

The most problematic issue of non-representative samples is when there is no sample within the nation on which to estimate the nation's IQ. In these circumstances, the authors imputed the national IQ based on estimates of neighboring countries. Thus while, Lynn and Vanhanen (2002) had IQ data on 81 countries, they reported IQs on 185 countries. In the 2006 book, the authors obtained data for 25 countries that had been estimated based on neighboring countries in their

2002 book. This permitted the authors to correlate the imputed estimates with the more recently obtained sample-based estimates. That correlation was .91 indicating very high convergence between the imputed national IQ and the sample-based national IQ estimates. This supports the adequacy of the imputation procedure. One might speculate that even though the imputation approach worked for these 25 countries, imputed correlations from countries for which no sample-based data are available could still be inaccurate. That speculation would be credible to the extent that the critic collected data showing support for that speculation.

Convenience samples can be criticized if the multiple convenience samples for a nation do not agree with each other. For example, if one sample estimated IQ at 80 and another sample estimated IQ at 105, one should question the credibility of the national IQ estimate. Lynn and Vanhanen (2006) addressed this potential criticism by examining the 71 countries for which multiple IQ estimates were available. The correlation between the lowest estimate and the highest estimate for a nation was .92. This analysis provides credible evidence that the convenience samples are generally in agreement with each other and raises confidence in the representativeness of the convenience samples. One might speculate that there could be other national estimates in which the convenience samples yield estimates that are substantially incorrect. As with other speculations, this one would be credible to the extent that the critics collect data to support their assertions.

IQ estimates from convenience samples can be criticized if they do not show correlations with related measures. Lynn and Vanhanen (2006) correlated their estimates of national IQ with math and science achievement in children for a subset of the nations. The correlations across math and science measures ranged from .79 to .89. In another analysis, math and science achievement data from 15 countries collected as part of the International Assessment of Educational Progress showed correlations with the math measure of .83 and with the science measure of .89. Analyses also were conducted with math and science achievement data collected by the Organization for Economic Cooperation and Development (OECD). National IQ estimates correlated .83–.87 with OECD math and science estimates. Independent of Lynn and Vanhanen's analyses, Hunt and Wittmann (2008) have documented the strong relationship between national IQ estimates (the 2002 estimates) and the OECD data. This is compelling given that Hunt has been a vocal critic of the Lynn and Vanhanen national IQ estimates. The Rindermann (2007, 2008) articles have also demonstrated a strong relationship between national IQ estimates and educational achievement data. Critics of the national IQ estimates might argue that the correlations between national IQ estimates and various math and science measures may be acceptable for the countries examined, but the IQ estimates for nations without such math and science data may be inaccurate. Such a position would be credible to the extent that the critics could offer data to support their position. The journal issue containing the Rindermann (2007) paper also contained many commentaries both supportive and critical of national IQ estimates and their meaning. Thus, the Lynn and Vanhanen (2006) book and their 2002 book have inspired much scientific research.

This review has addressed the issue of whether Lynn and Vanhanen's (2006) national IQ estimates are credible. This

reviewer concludes that they are credible and a valuable data set for future research. For those nations whose IQ estimates are drawn from nationally representative samples or where the estimates have shown substantial correlations with other cognitive measures, the IQ estimates are particularly credible. For the remaining nations, the IQ estimates may be the best available and are reasonable estimates for future research until such time as empirically-based evidence might show that they are incorrect. I do not argue that the estimates are perfect or that the estimates cannot be improved. The forceful nature of the Lynn and Vanhanen (2006) presentation has promoted a contentious debate that is yielding research in improving national IQ estimates and in evaluating their ability to predict important national criteria. That is how science progresses.

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Behavioral Genetics, 5th Edition, Robert Plomin, John C. DeFries, Gerald E. McClearn, Peter McGuffin, New York, NY: Worth Publishers, ISBN-10: 1-4292-0577-6, ISBN-13: 978-1-4292-057, XVIII introductory pages, 505 text pages

The fifth edition of this book provides an excellent introduction to the subject of behavioral genetics, aimed at readers with good pre-existing backgrounds in psychology. It has done so at least since the third edition in 1997, when it was rewritten to have a topical rather than methodological focus. The authors' goal is to share with readers their excitement about the field of behavioral genetics, from which some of the most important discoveries in the behavioral sciences have come in recent years. The book is structured to accomplish this nicely, as the focus of the primary text remains on what we know about genetic influences on behavior. At the same time, historical perspective and methodological issues are not ignored; they are