



Sex differences across different racial ability levels: Theories of origin and societal consequences



Helmut Nyborg

*University of Aarhus, Denmark*¹

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ABSTRACT

Jensen (1971) found that black girls score 3 IQ points higher than black boys, and white boys 1.5 IQ points higher than white girls. He, nevertheless, concluded that this did not support his Race \times Sex \times Ability interaction theory. Jensen (1998) further analyzed data, some from the National Longitudinal Survey of Youth (NLSY79), and suggested that there is no sex difference in general intelligence, *g*. Other studies have questioned Jensen's null sex difference theory.

The present study tested both theories with data from the ensuing NLSY97 survey, which represents the 15+ million 12–17 year old adolescents living in the US in 1997.

Total sample analyses confirmed the existence of significant inverse white–black IQ sex differences, and disconfirmed the null sex difference theory.

Separate race-age analyses demonstrated, however, that robust IQ sex differences materialize only after age 16, with no white–black interaction. At age 17, female IQ trails male by 3.6–7.03 points in three races, respectively. Classical IQ probability curves foretell that more males than females will enter the highest echelons of society, irrespective of race, and white Male/Female ratios at IQ 145 successfully predicted real-life sex differences in educational and occupational achievement. White males with IQ 55 can be expected to run a very high risk of encountering severe achievement problems, a risk shared to some extent with Hispanic male, but black females with this low IQ can be expected to perform worse than black males.

The paper finally proposed models to account for the origin of sex and race differences in IQ and related educational and occupational differences, involving gene copy numbers, brain size, and steroid hormones. It was suggested that the evolutionary background and physiological nature of sex and race differences explain why social engineering fails to eradicate them.

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1. Introduction

1.1. Problems

Jensen (1998) looked for sex differences in general intelligence, *g*, in the NLSY79 wave of the National Longitudinal Survey of Youth, which used the Armed Services Vocational Aptitude Battery (ASVAB). He concluded that "... the sex difference in *g* is either totally nonexistent or is of uncertain direction and of inconsequential magnitude." (Jensen, 1998, p. 540–41). However, other studies have questioned this conclusion (e.g. Flores-Mendoza et al., 2013; Irving, 2012; Jackson & Rushton, 2006; Lynn, 1999; Nyborg, 2005; Rushton & Jensen, 2005).

This raises the question of whether there will also be null sex differences after we have examined IQ data from the ensuing NLSY97 CAT-ASVAB computer aided IQ survey, which is the nationally representative study that NLSY79 is not. The NLSY97 analysis could further inform

whether sex differences in *g* and dispersion scores generalize across races.

All this is of interest because Jensen (1971) observed back in the 1960s that the level of black female scholastic achievement was generally higher than that of black males. He therefore decided to test a Race \times Sex \times Ability Interaction Theory (IT) that there is a black female advantage in IQ and no sex difference among whites. Testing the IT interested Jensen, because a black sex difference in IQ could assist in the identification of specific environmental factors in the white–black IQ difference itself. He therefore examined the IT in "... seven highly *g*-loaded tests and a total of more than 20,000 subjects, all of school age and most below age thirteen". After combining the data, Jensen found that black females lead black males by 3 IQ points and white males had a 1.5 IQ point advantage over white females. Even if statistical rejection of the null sex IQ difference theory was not possible, Jensen nevertheless concluded that the IQ differences were too small to explain the sex differences in favor of black female achievement. Contributing to this conclusion was further that the effect was inconsistent for different tests and in different samples, that data was not gathered systematically so as to be representative of the whole black and white populations in

E-mail address: helmuthnyborg@gmail.com.

¹ 1968–2007, retired.

the United States, and that girls tend to mature earlier than boys. Moreover, several subsequent large-scale studies (Broman, Nichols, & Kennedy, 1975; Jensen & Johnson, 1994; Roberts, 1971; Strauch, 1977), carried little support or even findings running counter to the IT.

A re-examination of Jensen's Race \times Sex \times Ability Interaction Theory (IT) with data from the NLSY97 wave entails several advantages. Contra the NLSY79 data, the NLSY97 data are representative for all adolescents living in the US in 1997. Data are gathered systematically for three major races (and includes a small "Other" race category). All subjects were examined by the same test. Not least, sample size allows data to be meaningfully broken down separately by sex and race for each year between 12 and 17.

A more general problem is that the origin and mechanisms of sex and race differences are still largely unknown despite massive research efforts. One factor here is the extent to which environmental factors contribute to these differences. Another problem is their predictive validity for education and occupation.

1.2. Specific aims and hypotheses

The present study approaches these problems with data from the NLSY97 study in the form of a series of hypotheses:

1. Since most studies find a sex difference, it is hypothesized that males score higher IQ than females.
2. Following Jensen (1971) we hypothesize, that there will be no white-black Race \times Sex \times Ability interaction.
3. Since most studies find race differences in IQ, it is hypothesized that races will also in this study rank themselves whites > Hispanics > blacks.
4. It is hypothesized that a moderate average male advantage in IQ combines, in accordance of classical distribution theory, with larger male distribution scores and predict a male overrepresentation at the very low and very high end of the intelligence distribution.
5. As Ree and Earles (1990) documented that the predictive power of IQ increases with increasingly higher task training demands, it is hypothesized that larger Male/Female probabilities and ratios provide increasingly more precise predictions of actual educational and occupational sex differences in achievement.
6. Visscher, Hill, and Wray (2008) observed that estimates of heritability for IQ from twin studies were "remarkably consistent in the range of 0.5–0.8, across many age groups". It is accordingly hypothesized that sex differences in education and occupations, based on IQ, both reflect their ultimate evolutionary origin, and are grounded in identifiable proximate physiological mechanisms.

1.3. Suggested solutions

The paper endeavors to combine evolutionary with ontogenetic theories in the attempt to associate a causal understanding of current observations of sex and race difference in IQ with their evolutionary origin. It further strives to identify part of the physiological mechanisms behind race and sex differences in IQ (g, Spearman, 1927) and relate this to achievement differentials in order to explain why IQ-related differences are so resilient to change, even after extended goal-directed social engineering.

1.4. The approach

The paper is divided into five parts. Section 2, after the introduction, documents the empirical approach to testing hypotheses 1–4, Section 3 tests hypothesis 5, and Section 4 discusses the empirical findings. Section 5 tests hypothesis 6 by venturing into evolutionary theory in the attempt to fathom the origin and physiological nature of sex and race difference in IQ and related achievement, in an eternal quest for a

unified account of *Molecular Man in a Molecular World* (Nyborg, 1994, 1997).

2. Empirical examination of race and sex differences in NLSY97

2.1. Subjects and analysis

A total of 7127 NLSY97 respondents completed the CAT-ASVAB97 subtests. Of those 5452 came from the cross-sectional sample, 1675 from a supplemental sample, as also young adults from two separate samples. The total sample was reduced for the present analysis to: 1) Only those with complete data, 2) Only whites, Hispanics, and blacks, because there were too few subjects in the "mixed" race group for meaningful breakdowns, and 3) Only 12–17 year olds, because there were too few 18 year olds. This reduced the total number of subjects to 6,912 respondents.

Tables 1a–1c provide age, actual and representative Ns, average PC1 g, and its IQ equivalent, all broken down by sex, race, and age.

The NLSY97 study offers individual case weights to provide an estimate of how many individuals in the United States are represented by each respondent when used in tabulation. According to the manual, the assignment of individual respondent weights involves three types of adjustment: 1) The reciprocal of the probability of selection (associated with housing unit as well as sub-sampling applied to individuals), 2) Differential cooperation rates (based on geographic location, group membership, and within-group sub-classification), and 3) Correction for certain types of random variation associated with sampling as well as sample "under-coverage" (used to conform the sample to Census Bureau estimates of population totals).

The use of weights in the present analyses is associated with the following restrictions and precautions. The weighted mean may not represent the entire population as the analyses are confined to sub-samples only with valid answers on all CAT-ASVAB97 items. Deletion of the difficult-to-interpret "other" races category of subject as well as of the diminutive 18 year old group involved just 180 subjects. Item non-response due to refusals, don't knows, or invalid skips was quite small, so the degree to which the weights are incorrect is probably quite small, so the population estimates presented here will most likely be accurate.

The NLSY97 calculates two types of sampling weight. The first "total sample" weight involves all NLSY97 respondents; these weights (when divided by 100) add up to an estimate of the number of U.S. residents in the sample age range 12–17 years in 1997. The second set named "cross-sectional sample weight" contains weights only for respondents in the cross-sectional sample and all over-sampled cases have a zero weight. These weights are also designed to produce an estimate of the number of U.S. residents in the sample age range, but since there are fewer respondents if the over-sample is omitted, each black or Hispanic (or Latino) respondent in the cross-sectional sample has a larger value. The recommended use of the two sets of weights are as follows. Total sampling weights can be used in race-related tabulations, in order to increase the precision for black and Hispanic (or Latino) youths. Cross-sectional weights can be used in tabulations focusing only on non-black, non-Hispanic youths, or that do not include any analysis by race/ethnicity. Details of sampling are provided by Moore, Pedlow, Krishnamurti, and Wolter (2000).

As the concept of statistical significance becomes notoriously difficult to interpret in analyses involving huge numbers of representative subjects, I preferred to remain on the conservative side in the analyses. The ensuing factorial multivariate tests for statistical significance are therefore (with the few exceptions noted later) based on the much lower actual number of Ns when testing hypotheses. However, representative Ns and IQs are tabulated in Tables 1a to 1c to allow the reader to directly estimate the (minor) IQ differences to results based on actual Ns. Graphically, the differences between IQ age-curves based on

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