Sex-related differences in general intelligence *g*, brain size, and social status

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Abstract

The question of a sex difference in intelligence has long divided the experts. IQ researchers sum standardized subtest scores to calculate *intelligence in general*, and find that males outscore females by about 3.8 points, whereas factor analysts derive the *g* factor scores from intertest-correlations and find no consistent sex differences in *general intelligence*. The latter finding is puzzling, as males have larger average brains than females, and brain size correlates .30–.45 with *g* (and IQ). Males thus ''ought'' to score a higher *g* than females.

The present study addressed this paradox by testing four hypotheses: (1) Inadequate analyses explain why researchers get inconsistent results, (2) The proper method will identify a male *g* lead, (3) The larger male brain ''explains'' the male *g* lead, (4) The higher male *g* average and wider distribution transform into an exponentially increased male–female ratio at the high end of the *g* distribution, and this largely explains male dominance in society.

All four hypotheses obtained support and explain in part why relatively few males dominate the upper strata in all known societies. The confirmation of hypothesis 3 suggests that the brain size—intelligence–dominance link may be partly biological.
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1. Introduction

Experts have long disagreed about the existence of a sex difference in overall intelligence. Some (e.g. Lynn, 1994, 1997, 1999; Lynn, Irwing, & Cammock, 2002) find that males outscore females by about 3.8 IQ points, but most find no sex difference (e.g. Brody, 1992; Halpern & LaMay, 2000; Jensen, 1998).

This disagreement is confusing for theoretical reasons. First, males dominate all higher ranks of education, research, occupation, and political power structures that call for capacity to deal with complexity, which is just another way of defining *general intelligence g*. Second, males have, on average, larger brains than females, and brain size correlates positively with intelligence. Yet, the empirical evidence for a male *g* advantage is equivocal.

The present study addresses these paradoxes by testing four hypotheses: (1) Ambiguous definitions and methods explain the current disagreement among the experts, (2) The proper analytic approach will identify a male lead in *general intelligence g*, (3) The larger male brain partly explains the average male *g* lead, and, (4) Classical Distribution Theory illustrates how a small male mean SD *g* score advantage and a wider male SD dispersion score translate into an exponentially increased male–female ratio at the high end of the *g* distribution. This unequal ratio of high *g* males to females explains in part why males (always, according to Goldberg, 1977) dominate the intellectually most demanding top occupational and political strata.

2. Hypothesis 1: Ambiguous definitions of intelligence and inadequate use of analytic methods explain the empirical inconsistency

2.1. The IQ position

Lynn (1994, 1997, 1999) claims that males ought to outscore females in IQ in terms of the following two syllogisms (Nyborg, 2002). First, brain volume correlates with IQ. Males have on average larger brains than females. Ergo: Males have a higher mean IQ than females. Second, job status and income correlate with IQ. Males have on average higher job status and income than females. Ergo: Males have a higher mean IQ than females. Lynn averaged several empirical studies, and found a male lead of 3.8 IQ points.

The problem with this is, however, that the total summed IQ score is sensitive to test item bias. Females will be favoured by an overweight of subtests tapping verbal abilities, and males by a spatial ability subtest bias. This means that a sex difference in *intelligence in general*, that is IQ, may reflect a test bias or a real sex difference, but by just summing up standardized subtest scores we would never know the difference (Jensen, 1998).

2.2. The g position

A methodologically better approach is to factor analyse the intertest-correlations among subtests and derive *g*, which reflects *general intelligence* that shows higher reliability and validity than IQ scores. However, factor analysis gives inconsistent results: Females outscore males in