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The end of the Flynn effect? A study of secular trends in mean intelligence test scores of Norwegian conscripts during half a century

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Abstract

The present paper reports secular trends in the mean scores of a language, mathematics, and a Raven-like test together with a combined general ability (GA) score among Norwegian (male) conscripts tested from the mid 1950s to 2002 (birth cohorts ≈1935–1984). Secular gains in standing height (indicating improved nutrition and health care) were also investigated. Substantial gains in GA were apparent from the mid 1950s (test years) to the end 1960s–early 1970s, followed by a decreasing gain rate and a complete stop from the mid 1990s. The gains seemed to be mainly caused by decreasing prevalence of low scorers. From the early 1970s, the secular gains in GA were almost exclusively driven by gains on the Raven-like test. However, even the means on this particular test stopped to increase after the mid to late 1990s. It is concluded that the Flynn effect may have come to an end in Norway. Height gains were strongly correlated with intelligence gains until the cessation of height gains in the conscript cohorts towards the end of the 1980s. Contrary to the intelligence gains, the height gains (conscript cohorts 1969–2002) were most pronounced in the upper half of the distribution. Evidence indicating decreasing intercorrelations between tests is reported.
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1. Introduction

It has long been known among intelligence test users that test performance improves from one generation to the next (the Flynn effect), necessitating new and stricter norms from time to time. Scientific interest in secular increases of intelligence test scores virtually exploded after the publication of the seminal paper by Flynn (1987), reviewing data showing substantial gains in 14 industrialized countries in Europe, North America, and the Far East. Later, secular gains have been observed in Sweden (Emanuelsson, Reuterberg, & Svensson, 1993; Emanuelsson & Svensson, 1990), Denmark (Teasdale & Owen, 1989), Israel (Flynn, 1998a), and in urban regions in Brazil and China (Flynn, 1998b). The average gain seems to be about 3–5 IQ points per decade. Recently, a diminishing growth rate in the birth cohorts 1940–1980 of male conscripts has been observed in Denmark (Teasdale & Owen, 2000). In Sweden, the secular trends may have more or less leveled out in the birth cohorts between 1972 and 1977 (Emanuelsson et al., 1993).

The secular gains seem to be largest on tests not clearly related to school curricula and presumably measuring fluid intelligence (Cattell, 1987). On Raven's Progressive Matrices and Raven-like tests, gains in the neighborhood of 18–20 IQ points in a generation seem to be quite typical in many industrialized countries (Flynn, 1999). Kenyan 7-year-old school children in a rural district showed the most dramatic gains on the Raven Progressive Matrices Test ever observed (estimated to be at least 0.8 IQ points per year) over a 14-year period from 1984 to 1998 (Daley, Whaley, Sigman, Espinosa, & Neumann, 2003).

At least in some countries, the secular gains seem to have been unevenly distributed over ability levels. Teasdale and Owen (1989, 2000) found that the secular gains mainly were caused by lower prevalence of low scorers. In Britain, the same tendency was found for some tests (including Raven's Progressive Matrices), but not for others (Lynn & Hampson, 1986). In other countries, the gains seem to be evenly distributed cross ability levels (Flynn, 1998b).

Detterman and Daniels (1989) reported smaller correlations between different tests in high-scoring than in low-scoring groups, indicating that the secular gains may be accompanied by the changing factor structure of intelligence test scores. Recently, Kane and Oakland (2000) reported that the test intercorrelations in the U.S. Wechsler tests were lower in more recent standardization samples relative to older ones (time span 20–50 years). Indications of declining intercorrelations have also been found in France (Lynn & Cooper, 1993). Data on Danish conscripts (males) over a 10-year period showed only small downward changes in the intercorrelation pattern (Teasdale & Owen, 2000).

The main aim of the present paper is to report data on the secular trends of mean general intelligence test scores and subtest scores of a large number of Norwegian (male) conscripts who were tested in the years from 1954 to 2002, inclusive (birth cohorts $\approx$1935–1984). Changes in the distribution of test scores have also been scrutinized. In particular, we have looked for possible secular trends in the variation pattern of test scores, and, whether the secular gains have been evenly distributed across ability levels. To investigate possible changes in the prominence of the *g* factor, we have studied secular trends in the intercorrelations between tests.

In addition, secular trends of standing height have been analyzed. Standing height is a useful indicator of nutrition and health status, and secular gains in height have, to some extent, occurred in tandem with IQ gains (Martorell, 1998). Lynn (1990) has proposed that nutrition and health care improvements are among the main causal factors of IQ gains. It seems clear that nutrition and health care factors may not tell the whole story. Thus, the Flynn effect has outlasted height gains by a decade or so in many countries

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