



## The Flynn effect in South Africa

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### ABSTRACT

This is a study of secular score gains in South Africa. The findings are based on representative samples from datasets utilized in norm studies of popular mainstream intelligence batteries such as the WAIS as well as widely used test batteries which were locally developed and normed in South Africa. Flynn effects were computed in three ways. First, studies where two different groups take the same test, with several years in between, using representative or comparable samples were used. Second, studies where the same group takes two different test batteries at a specific time were used. Third, the score differences between English- and Afrikaans-speaking Whites in South Africa in the 20th century were compared. The Flynn effect in White groups in South Africa is somewhat smaller than the Flynn effect in Western, industrialized countries (total  $N=6534$ ), and the Flynn effect in Indian groups is substantially smaller (total  $N=682$ ). Non-verbal IQ scores surpassed increases in verbal IQ scores. The findings from English- and Afrikaans-speaking Whites evidence a leveling out of differences in score gains over the 20th century (total  $N=79,310$ ). A meta-regression analysis showed no clear support for the moderators a) method used for computing the Flynn effect gain, b) type of test battery, c) time span, d) quality of the sample, and e) average age of sample.

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### 1. Introduction

Secular score gains in IQ test scores are one of the most intriguing and controversial findings in the recent psychology research literature. James Flynn (1984, 1987) was the first to show that average scores on intelligence tests are rising substantially and consistently, all over the world. These gains have been going on for the better part of a century – essentially ever since standardized tests were developed. Although Flynn effects have been shown for many countries, as yet, little has been done on the Flynn effect in South Africa. This paper is the first to describe the Flynn effect in South Africa using a large number of primary studies.

The Flynn effect refers to the increase in IQ scores over time. For Western, industrialized countries, between 1930 and 1990 the gain on standard broad-spectrum IQ tests averaged three IQ points per decade. This trend has continued to the present day in the United States (Flynn, 2007, 2009a). In the United Kingdom, gains on the Raven's Progressive Matrices are still robust except oddly, at ages 13 to 15, an exception confirmed by Piagetian data (Flynn, 2009b; Shayer, Ginsburg, & Coe, 2007). It is a global phenomenon and has been recorded for a number of industrialized and non-industrialized nations including countries in Africa (Flynn, 2006). For verbal tests, or more precisely, tests with a content that most reflects the traditional classroom subject matter, the gain is 2 IQ points per decade, and for non-verbal (fluid and visual) tests the gain is 4 IQ points per decade (Jensen, 1998).

Recently, however, studies from Denmark, Norway, and Britain show that the secular gains have stopped and even suggest a decline of IQ scores (Lynn, 2009; Shayer et al., 2007; Sundet, Barlaug, & Torjussen, 2004; Teasdale & Owen, 2008).

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However, there is also recent evidence of IQ test scores continuing to rise in Western, industrialized countries (e.g. in France, see Bradmetz & Mathy, 2006) and in countries in the former communist Eastern Europe (e.g. in Estonia, see Must, te Nijenhuis, Must, & van Vianen, 2009). Recent studies show IQ scores rising in less-developed parts of the world, for example in Kenya (Daley, Whaley, Sigman, Espinosa, & Neumann, 2003), Sudan (Khaleefa, Abdelwahid, Abdulradi, & Lynn, 2008) and in the Caribbean (Meisenberg, Lawless, Lambert, & Newton, 2006). However, there are, to this date, only two studies of the Flynn effect in South Africa (Richter, Griesel, & Wortley, 1989; Wicherts, Dolan, Carlson, & van der Maas, 2010).

Various causes have been hypothesized for the Flynn effect, including education, nutrition, health care, inbreeding, GDP, urbanization, family size, health care expenditure, the dissemination of visual–spatial toys, and teacher to student ratio (see Flynn, 2006, 2007; see Jensen, 1998, ch. 10). It is difficult to conclude what the most important cause is, as many of the effects take place at the same time and show similar trends.

### 1.1. Racial classification and segregation in education in South Africa

The four racial groups currently classified in the country are Black, White, Colored, and Indian. The latest South African Government statistics (2007 mid-year) reveal a total populace of 47,850,700 of which Blacks account for 79.6%; Whites account for 9.1%; Coloreds account for 8.9% and Indian/Asian account for 2.5%. Whites are of European descent and a distinction is made between Afrikaans- and English-speaking Whites. About 60% of the White population of South-Africa are Afrikaans-speakers. The Afrikaans-speaking are chiefly descendant from the French Huguenots and Dutch peoples. Historically their social development sprang from an impoverished rural base (Claassen, 1997). In 1946 the per capita income of Afrikaans-speaking Whites was 47% of that of the English-speaking Whites; in 1960 it was 60%, and in 1976 it was 71%. About 40% of the Whites are English-speaking and traditionally they completed more years of secondary and tertiary schooling, but this has changed through the years from the early twentieth century and both English- and Afrikaans-speaking Whites are more or less on a par (Claassen, 1997). Throughout the 19th century the majority of Afrikaans-speakers were educated at home, due in part to the resistance of English education for their children in the British-dominated education system and enrollments among this group was considerably lower than enrollments of English-speakers in the British-held territories (Byrnes, 1996). The effects of these choices were felt throughout half of the 20th century in the South African education system. The increase in number of years of education through the years has been hypothesized to partly account for the increases evidenced in IQ scores for the latter group (Claassen, 1997; see also Ceci, 1991 and Jensen, 1998). Coloreds are of mixed racial origin spanning numerous countries outside Africa but having substantial genetic Southern African ancestry (some Coloreds are of Bantu–Khoisan descent). This term does not have the same meaning as the American term ‘Colored’. In South Africa it does not refer to a Black person. The reason for the presence of Indian populations is that in the nineteenth century the European colonists needed laborers for manual work of various kinds. Indians were brought over from the

1860s onwards principally to work in the sugar and cotton plantations in Natal. It must be recalled that during the Apartheid era, national education was decentralized regarding access to equal opportunities and resources. Education for Black school children was by and large severely below the White counterpart standards (Shuttleworth-Edwards et al., 2004). Difference in schooling is also reflected in the difference between White and non-White access to higher education. In 1921, 22% of the White population attended public or private schools in comparison to 4.6% of non-Whites. However, in 2007, 76% of the non-White population attended public or private schools and 73% of the White population attended private or public schools in 2007 (Department of Education, 2008). As of 2006, non-Whites make up 74% of the student population attending public higher education institutions and similarly make up 77% of the student population conducting distance education (Department of Education, 2008).

### 1.2. IQ testing and group differences in South Africa

During the early part of the 20th century South African test developers utilized existing international test batteries as their main source of test information usually derived from the Binet type individual test and the Army Beta group test (Fick, 1929, 1939). As early as 1916, the Moll–Leipoldt Scales had been compiled, initially under the name ‘Binet–Simon–Goddard–Healy–Knox Scale’ with a group intelligence test being released in 1924 at the University of Stellenbosch (Smit, 1996). Through the intervening years (1924–2008) a number of international tests were utilized and/or standardized for local South African conditions. South African-developed tests include, among others, the South African Group Intelligence Test (SAGIT), and the Individual Scale of General Intelligence for SA (ISGIS). The testing tradition in South Africa thus reflects an amalgamation of original uniquely developed and normed tests as well as normed and locally standardized international tests (Huysamen, 1996).

South African literature has shown for many decades that substantial differences in test scores between various cultural and language groups exist (Biesheuvel & Liddicoat, 1959; Claassen, Krynauw, Paterson, & wa ga Mathe, 2001; Dent, 1949; Fick, 1929; Foxcroft & Aston, 2006; Irvine, 1969; Knoetze, Bass, & Steele, 2005; Rushton, 2001; Rushton & Skuy, 2000; van der Berg, 1989; Verster & Prinsloo, 1988). The most cited, influential, and detailed book on group differences in IQ is by Lynn and Vanhanen (2002). Based on a review of the South African literature on IQ testing (pp. 218–219) they estimate the IQs for four groups: Whites: 94; Coloreds: 82; Blacks: 66; and Indians: 83. Whites outscore non-Whites, and within the White group English-speakers outscore Afrikaans-speakers; the latter finding has been well documented (Mariotti, 2009). Increasing access to education for the Afrikaans-speakers was a direct result of the social policies implemented from the mid-1940s onward; this is most likely the most important factor (Prinsloo, 2007). The Nationalist Party, which came to power in 1948, instituted an affirmative action program to enable Afrikaans speakers greater participation in the labor force. This continued till the mid 1960s at which time Afrikaans-speakers were more settled in urbanized life (Louw, 2004). Often, positions were reserved for poor Afrikaans-speakers in the state-owned railways and civil service. These were generally low-paid jobs but provided stable home environments ‘for children entering

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