

The Historical Roots of Poverty and Inequality in South Africa: the Coloured Population

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I. The Coloured Population at the End of Apartheid

South Africa, with Botswana, has the world's largest gap between per capita GDP and performance on the Human Development Index (UNDP 2007/8, Table 1). The divergence of social from economic indicators in South Africa reflects a high level of economic inequality by international standards (UNDP 2007/8, Table 15; Taylor 2000, p.60). Much of the inequality originates with race. For the mid-1990s it is estimated that race, by itself, accounted for nearly 40% of all inequality (Taylor 2000, p.62). The same data show that the poorest one-fifth includes 23% of all Africans and 11% of the Coloured population, but only 1% of Indians and Whites.

We are particularly interested in the Coloured population, which during during the 1990s Coloureds had a per capita income about one-fifth that of whites – compared to Africans at one-tenth of the white standard (Leibbrandt et al, 2006). Household surveys c2000 identify median hourly earnings for Coloureds and Africans in semi-skilled occupations as being 38% and 41% of the comparable figure for whites; for unskilled labour the comparison is 50% and 57% (Woolard and Woolard 2007, p. 23). The distribution of employment by skill and uneven incidence of unemployment of course aggravate the disparities. Half the Coloured population in 1995 was below a lower bound poverty line derived from household expenditure surveys (Ozler 2005, Table 1). The comparable figure for Africans was 68% against 1% for whites. As recently as 2001, in spite of a marked income improvement in the previous five years, one in twenty Coloureds still lacked access to piped water, 12% lived in informal or ‘traditional dwellings’ and 20% had neither flush nor chemical toilets (Leibbrandt et al, 2006).

There is little doubt that economic deprivation has diminished physical well-being. The white population in the 1980s experienced 13 infant deaths 1000 live births in contrast to 57 deaths for Coloured births and 68 for Africans (Cameron 2003). Birth weights from a 1990 Soweto-Johannesburg study found the mean weight of new-born whites to be 3223 grams, against 3079 grams for African infants and 3023 grams for the Coloureds. Post-natal growth accentuated rather than diminished differences by race. Within the Coloured population children growing up in a rural community with low socio-economic status averaged 5% shorter and 20-25% lighter in weight than coloured children from more affluent families in the greater Cape Town area (Henneberg and Louw 1998). The patterns of variation by race follow through to adulthood. The mean stature for male soldiers 2000-2005 was 171 cm for Africans, 170.3 cm for Coloureds and 178.4 cm for whites (Steyn and Smith 2007).

Patterns visible at the end of the 20th century reflects a deep history of inequality and deprivation for Coloureds including four decades of apartheid policies enacted in the wake of the National Party's 1948 electoral victory. The story of post-war Apartheid in South Africa is most often told in black and white. But South African inequality did not begin in 1948, and the immediate victims of race-based legislation were Coloured as much as African. Indeed, to the extent that Africans had already lost legal equalities or never had them, the 1948 regime change weighed disproportionately on Coloureds.

In this paper we review the historical origins of poverty and inequality in South Africa with a particular interest in the Coloured community. We begin with a brief account of its origins and identity, followed by evidence of well-being during the late 19th century mineral revolution and then the experience of political union following 1910. Analysis of military medical examinations recorded during World War One and World War Two add to the evidence. We conclude by considering the possibility that important as post-1948 apartheid undoubtedly was, it is not the principal cause of poverty and inequality among South Africa's Coloured population today.

II. Origins and Nature of the Coloured Population

Conventionally four groups are recognized within the South African population: Europeans and their largely white descendents, Africans and their largely black descendents, Asians or Indians and a fourth group, the Coloured population accounting for 8-10% of the South African population throughout the 20th century. The latter are mixed race descendents of Europeans who landed at the Cape, slaves of eastern origin imported into the Cape and Africans (most of whom were introduced as slaves from elsewhere on the continent. The Coloured group also includes the Cape Malays, descendents of Muslim slaves brought by the Dutch from the East Indies. The later are distinguished from the Asians, descendents of Indian indentured labour immigrants to the Natal sugar plantations (Christopher 2002; Deacon 2004; Golding and Joshua 1951; Marais 1939, pp.1-31; Simkins and van Heyningen 1989 p.91).

The complexity of Coloured identity arises from a mixed race genetic composition but also from social and economic transformations of the 19th century (Adhikari 2005; Marquard 1952; South Africa 1937). The early years of Dutch presence in the Cape saw considerable mingling of Europeans with imported slaves and to a lesser extent with local Africans. During the first two decades 1652-1672 it is estimated that 75% of children born to slave mothers had European fathers (Marquard 1952, p75).¹ A significant proportion of mixed-race offspring were raised as Christian and accepted as legitimate members of the European community (Ross 1976). Indeed, there was no formal prohibition on marriage between free and slave residents of the Cape until 1685, and even at that marriage continued to be allowed between Europeans and half-breeds.

The mixing of populations continued through the 18th and 19th centuries. Watson (1970, p. 18) cites an estimate by Marie Kathleen Jeffreys that 15%-30% of all marriages

1. Here Marquard cites H. Sonnabend and Cyril Sofer, "South Africa's Stepchildren: A Study of Miscegenation" in *South African Affairs Pamphlets* 16 (1948), 1-32.

in 18th century South Africa were mixed.² The absence of a rigid racial ideology and race-based social order allowed the continued growth of a mixed race population. Social fault lines were configured more around religion and, prior to the abolition of slavery, around legal constraints on individual liberty than on race. Coloured or mixed race communities in the Cape acquired distinctive identities Marais (1939), but most historians recognize them as having “a social rather than a genetic status” Ross (1976, p. 76).

Through the 19th century there continued to be some mixing (marital and non-marital) of Coloureds with whites and, increasingly, with Africans (Marquard 1952 p. 15; Wilson 1969, pp. 245-246). A number of missionary schools remained multi-racial; about one-third of white pupils in the Cape Colony c1900 attended mission schools which had no colour bar (Wilson 1969, p. 261). Indeed, the Cape Colony had a common multi-racial electoral roll when it acquired representative government in 1852 and full responsible government in 1872 (although admittedly the wealth requirements for franchise effectively limited the number of non-white voters).

Nevertheless, a number of forces were tending to increase racial rigidity. Van Arke, Quispel and Ross (1993, pp. 90-102) note that central authority over individual farmers diminished following the British assumption of control in the Cape. An increasing reliance on local African (Khosian) labour, at the same time as old methods of labour control were undermined by the passing of the ‘Fiftieth Ordinance’ in 1828 and slave liberation in 1834, may have fuelled the growth of a colour consciousness (Marquard 1952, pp. 10, 75; Van Arke, Quispel and Ross 1993, pp. 90-102ff).³ The diamond and gold booms greatly expanded the white engagement with African labour and, through the same logic, encouraged the development of colour consciousness to facilitate the control of labour. Even Coloureds increasingly sought to differentiate themselves from the incoming Africans (Adhikiri 2005).

A potent symbol of the increasingly rigid racial practice is provided by the growth of a government-run school system during the closing decades of the 19th century. Schooling was compulsory for whites but not for Coloureds or Africans. The rapidly expanding government schools served the white community almost exclusively since the 1860s. Eventually, in 1911, the Appellate Division of the Union Supreme Court formally denied the right of certain Coloured children in the Cape to attend European government schools even in their own village. As white children gradually switched to government schools, Coloured and African children came to dominate the mission schools which, not coincidentally, received less state support (Marais 1939, pp. 269-273; Welsh 1969, pp. 221-226; Wilson 1969, p.124; Wollheim, 1951 p.95).⁴

2. On Jeffreys’ work see Distiller and Samuelson, ““Denying the Coloured Mother”” 2005. Marais (1939, p. 282) appears to favour a more conservative estimate.

3. The Fiftieth Ordinance repealed previous pass laws and established the principle of equality among free people of all colours.

4. From 1894 to 1909 government expenditure on mission schools increased from 15s.3¾d. to 17s.7d. per pupil. Spending on white students increased from £2.8s.9d per pupil to £3.15s.11d in ‘farm’ schools and from £3.5s.0d to £5.13s.6d. in ‘first’ class schools. By 1924 the state subsidy for white pupils was almost three times that of Coloured pupils (Marais, 1939 p.272-273).

The diminishing social status of the Coloured population did not end its intermingling with white society, but the nature of the relationship changed. Coloureds continued to live side by side with some whites, but they tended to be the poor whites in relatively unhealthy neighbourhoods (Marquard, 1952, pp. 80). Admittedly, large numbers of mixed-race South Africans passed as whites in order to avoid the encumbrance of being identified with an inferior racial group. Van den Berghe (1965, p. 42) estimates that as of the 1960s “anywhere from one-tenth to one-quarter of the persons classified as “White” in the Cape Province are of mixed descent, and that every “old family” from White Cape Society has genealogical connections with Coloured Families”. Others put the proportion of whites who are of mixed descent much higher.⁵ Watson (1970, p. 18) argues that the paucity of Coloureds living in Coloured neighbourhoods with a fair complexion, in itself, suggests that many of those who have been able to pass as white have chosen to do so.

[TABLE 1 HERE]

Thus Coloured people in South Africa, then and now, constitute a complex and heterogeneous community. At any point in the past 200 years they have shared considerable genetic affinity with both Africans and European-descended whites, and partly for this reason the Coloureds themselves do not have a common genetic identity or social origin. Some Coloureds circa 1900 were sixth or seventh generation descendents of seventeenth-century unions while others were first-generation children of mixed race unions during the late 19th century. Neither do the Coloureds share a single appearance. Some look more European, while others appear closer to the African (Patterson, 1953 pp. 14-21; Golding and Joshua, 1951 p.71; Marais, 1939, pp.1-31). Many have shared language, religion and culture with the Europeans in spite of being recognized socially and legal as a distinct race.⁶

The Coloured population at the time of Union could be found in all corners of South Africa although by far the largest concentration was in the Cape Colony (Table 1). As late as the 1930s nearly 90% of the Coloureds continued to live in the Cape, mainly the Western Cape. The 1936 census also reveals that about 50% of the Cape Coloureds lived in the rural areas (Marais, 1939 p.266; Patterson 1953 Appendix C p.352). Of course the apparent precision of these census-based estimates is deceptive to the extent of undercounting (especially in rural and African-dominated areas) and by the constructed nature of racial identities.⁷

In this section of the paper we have characterized in necessarily broad strokes the nature and origins of the Coloured community. The precision of legal identities and census tabulations cannot obscure that the population is socially constructed in a rather complicated way. We can recognize, as Robert Ross observes for the 18th century, that the identity of the Coloured population is social rather than genetic. The identity and

5. See G. Findlay, *Miscegenation* (Pretoria: Pretoria News Publishers, 1936) cited by Watson 1970, p. 19 and H. Sonnabend and Cyril Sofer, "South Africa's Stepchildren" cited by Marquard 1952.

6. Not surprisingly, the legal status of Coloureds has been complex. Patterson (1953 Appendix I pp 361-363) and Christopher (2002) review the inconsistent definitions over time of a 'coloured person'.

7. Feinstein (2005, Annex 1, pp.257-259) extrapolates from 1904 to provide annual population by race from 1904 to 1996. See also Patterson (1953 Appendix A p.351).

status of being Coloured is a product of a historically contingent process as much as its genetic composition. We might also recognize the potential importance of the tendency for white-looking Coloureds to leave the community in order to pass as whites. If the estimates of large-scale passing into the white community are correct, and if the white-looking racial migrants have been atypical in terms of health, education and income-generating capacity, then at any point during the 19th or 20th century the observed characteristics of the Coloured community, ie those who did not pass, reflect the effects of selective migration not unlike other migration processes.

III. Economic Change and a Sharpening Social Gradient during the Nineteenth Century

Before the discovery of diamonds in 1867 and gold in 1886 most South Africans of all races outside of Capetown lived in rural and sometimes isolated communities, often in large and sparsely populated farms (Wilson, 1971 p.109).⁸ Port cities were still largely commercial centres; the dominant classes were merchants, retailers, traders, masons, carpenters (Feinstein, 2005 p.114). Larger towns in the interior were local and regional centres for commercial activity, administration and manufacturing. Gold and diamond mining greatly increased the country's engagement with international markets and hastened industrialization. Population grew most dramatically in the Transvaal. Capital investments in railways, light manufacturing and public works and the growth of a more sophisticated civil service owe a great deal to the mining expansion (Simkins and van Heyningen, 1985, p.99; Feinstein, 2005, pp. 90-123). Largely autonomous developments in the countryside reinforced the pressures for urbanization: rinderpest in the 1890s, the long drought of 1897, the devastation of the 1899-1902 war the abolition 'kafir' farming in 1913 and a closing of the frontier of inexpensive land (Wilson, 1971 pp .126-127).

The labour market became increasingly segmented. Organizations of white miners successfully pressed for preferential treatment against unskilled workers as early as the 1870s. The first formal color bar followed in 1893 (Wilson, 1971; Katz, 1999; Breckenbridge, 1998; Davies, 1976).⁹ Similar albeit less rigid restrictions were applied to Coloured and Asian workers (Feinstein, 2005 p.74). The wages paid to Africans and Coloureds were low both in absolute terms and relative to those paid to the whites. Africans in particular were argued to be temporary *sojourners* in urban areas with a home in rural areas. At the opposite end of the income spectrum, skilled white workers benefited from an increasing demand for their skills and from the political and legal entrenching of segregation (Davies, 1976; Breckenbridge, 1998; Katz, 1999; Packard, 1989; Feinstein, 2005 p.75-78). Wages in mining, railways and the cities were high enough to attract white workers away from farming. This created a demand for non-white labour which was met with coercive recruitment strategies (taxes, land restrictions and later pass laws) rather than higher wages.¹⁰ The result was considerable wage and

8. Wilson (1971 p.113) notes that only the wealthier white farmers had houses with a front room in which the family ate and lived by the day apart from a kitchen and bedrooms.

9. Industrial color bar rules may have improved mine safety but they also protected skilled and unskilled white jobs by reducing competition from the growing numbers of relatively skilled proletarianized or semi- proletarianized Africans and Coloreds (Davies 1976 pp.41-69; Katz 1999 pp.73-97).

10. A mistaken belief that the supply curve of farm labor was backward sloping encouraged the coercive tactics (Feinstein, 2005, p.68-70; Wilson, 1971 p.121).

income inequality in spite of a robust demand for labour and increasing per capita income (Houghton, 1980 p.40; Feinstein, 2005 pp3-11).

Wage and income data were not systematically collected until after 1910, and even at these data pertain largely to white occupations. Nonetheless, evidence of race-based inequality from individual labor markets is abundant. For example, in 1866 the average monthly cash wage for white farm foremen and head shepherd in the Cape Colony was £2.18s. 1d, while non-white servants, cattle herders and shepherds earned 12s.10d per month (Wilson, 1971 p.158-161). Some non-white workers were paid partly in kind (rations, grazing rights, land or accommodation) or through a tot system that included payments in wine and brandy.¹¹ Later, circa 1900, whites in the building industry earned a maximum of 9s a day while Coloureds were paid 7s 6d for the same working day (Davies, 1976, p. 68; Feinstein 2005 p. 671 Simkins and Van Heyningen 1989, p.105). At the same time Africans and Coloureds in the Witwatersrand mines earned less than whites even when employed in skilled jobs normally reserved for whites (Davies, 1976 p.69). In the Cape colony, Coloureds employed by the railways were paid less than whites doing the same job (Marais 1939, p.265).

Marais argues that by time of the union in 1910, few Coloureds held graded positions in the Cape Colony civil service because the ‘backward state of their education prior to the union no doubt rendered but few of them eligible for official appointments’ (Marais 1939, p.261-262). After the union, the prospects for obtaining graded positions “were destroyed by administrative order except one department of the Public Services, Posts and Telegraphs which employed a number of them as postmen, messengers and so on”.

Not surprisingly, economic inequality influenced health outcomes. Admittedly rapid urbanization around the mines and in port cities created a heightened risk of tuberculosis, diarrhea, typhoid and influenza for everyone (Marais 1939, p. 259; Phillips, 1987; Simkins and Van Heyningen, 1985, p99; Swanson, 1985; Packard, 1989; Deacon, 2000 p.204; Low-Beer *et al.*, 2004 pp.223-245). Nevertheless, whites found ways to protect themselves. In the face of increasing health hazards an organized, politically vocal medical profession contributed to local and national public health reforms (Deacon 1998, 2000; Deacon *et al* (2004). White civil servants formed a medical association, the Civil Servants’ Medical Benefit Association, that became compulsory in 1905. Such organizations addressed the needs of white public servants and left the nonwhite communities without government-sponsored medical support except at government hospitals (Verhoef 2006).

African, Coloured and even poor white urban migrants remained at risk as economic pressures and mounting segregationist sentiment pushed them into crowded and adverse living conditions (Kuper, 1950; Bickford-Smith, 1995; Marais 1939, pp.179-199; van Heyningen, 1985p.98; Packard, 1989 p.42-43). Popular stereotyping of Africans as diseased and ‘uncivilized’ reinforced the segregationist sentiment. As early as 1870 fear of cholera, smallpox and plague had led to the segregation of Indians and Africans in

11. The ‘tot’ system was firmly established in the Western Cape during the 1860s. A century later the tot system was still entrenched in the Western Cape especially in vineyards in spite of criticism from several government commission and church reports (Marais, 1968 p.268; Wilson, 1971 p.162.).

Natal and Transvaal (Swanson 1977, 1983, and 1985). Subsequent laws included the Transvaal Law 5 of 1885 (denying Asians an electoral franchise), Public Health Laws of 1883 and 1887, the Native Labor Locations Act of 1899, the Native Reserves Act of 1902 and the Immigration Restriction Act of 1902 (Freund 2001; Scott 2003 pp.235-259; Mabin and Smit, 1987). Deacon (2000 pp. 203-206) discusses the racialized medical practices in the Cape Colony, in particular the Leprosy Repressions Act of 1891 that reflected a racist stereotyping of the leper as black.

Many municipalities to allocate resources that would improve the health of largely non-white neighbourhoods (Packard 1989, pp. 55-57; Marais 1939, p.258). In some cases, sanitation, refuse collection and water supplies literally stopped at the boundary of African and Coloured locations. Few locations had sanitation facilities; Coloureds in one Cape Town location had to fetch water from an irrigation furrow after it had passed through the town (Marais 1939, p.258). Packard (1989 pp.55-56) observes that the African locations in East London had no latrines; 8,500 residents had to use latrines that were outside the location. Some non-white locations on the Rand, such as Ndabeni, were situated adjacent to rubbish dumps. The medical profession noted that these health hazards for non-whites created an indirect threat to the white community (Swanson, 1983; Deacon *et al*, 2004). The lack of substantial progress eventually attracted criticism from the Tuberculosis Commission of 1914 (Packard, 1989).

Inequities in access to health care reinforced the impact of residential segregation. Mine employees received greater medical attention than most workers but the Rand mines before 1916 made no provision for the medical examination of African workers unless they showed signs of illness or severe wasting (Packard, 1989; Marks, 2006). By contrast, white mine workers received periodic examinations (and better medical treatment if they fell sick). Not surprisingly, although everyone was at risk from tuberculosis, malaria and other infectious diseases, the burden and incidence of death fell disproportionately on Coloureds and Africans (see Packard, 1989; Marks, 2006). For example, the 1901 plague that hit Cape Town killed 34 percent of infected whites against 57 percent of infected Coloureds (Mitchell, 1983; Simkins and van Heyningen 1989 p98). The 1918 influenza had similar impact; the crude death rate in Johannesburg was .0027 for Africans, .0038 for Coloureds and .0016 for whites; the Cape Town experience was similar (Unterhalter 1982, p.620; Phillips 2006, p.596).

Available evidence on life expectancy supports the impression of extreme inequality by race. Between 1891 and 1906 the life expectancy at birth was 15 years higher for whites than for Africans and Coloureds in the Cape Colony (Simkins and Van Heyningen 1985, p.93). In both 1913 and 1939 the crude death rate in Johannesburg was .0009 among whites, against .0016 and .0018 for Africans and .0023 and .0015 for Coloureds (combined with Asians in 1913 – see Unterhalter 1982 p. 620).

The infant mortality differential was equally high. Evidence from Cape Colony censuses suggests that between 1891 and 1904, infant mortality per 1000 live births was 150 for white children, 304 among blacks, 312 for Coloured boys and 276 for Coloured females (Simkins and Van Heyningen, 1985). In Johannesburg whites infant mortality declined rapidly from 117 per 1000 live births in 1909, to 90 in 1918 and 51 in 1939 while the

Africans and Coloured figure declined from 369 in 1909 and 225 in 1918 to 189 by 1939 (Simkins and Van Heyningen; Unterhalter 1982). Of course there was considerable inequality among whites as well (Keegan 1987 pp. 28-29; Phillips 1987; Unterhalter, 1982). Unterhalter (1982 p. 631) shows that in 1919 infant mortality for whites was 63 per 1000 live births in the affluent northern suburbs of Johannesburg while in working class suburbs of Newtown, Mayfair and Fordsburg it was as high as 113. Investigations into the 'poor white' problem after the 1899-1902 war suggest considerable inequality between poor and middle-class whites (Keegan, 1987).

For all groups, the greatest killers were respiratory diseases (pneumonia, tuberculosis) followed by diarrheal diseases (dysentery, typhoid), hookworm, measles and malnutrition. Phillips (2006 p.594) argues that ignorance about suitable diet or inability to afford one was a major cause of malnutrition and that unsanitary living conditions were the principal cause of gastroenteritis, meningitis and scarlet fever in Cape Town's Jewish community. Tuberculosis was four to six times more prevalent among Coloureds than Europeans (Marais 1939, p.259). It declined quickly among whites after 1900, as it did in Europe, but it remained high among Coloureds and Africans until the development of effective drugs in the early 1950 (Packard, 1989 p.4, 41).

The average death rate of Africans and Coloureds from diarrheal diseases in Johannesburg from 1903 to 1913 was .00027 against .00022 for whites (Packard, 1989 p.57). The relatively small differential reflects the poor state of municipal waste disposal for everyone before 1920. Subsequently, the differential widened as improved water-borne sanitation reached white but not African and Coloured neighbourhoods (Packard, 1989 pp.126-146; Unterhalter, 1982 p.621).

Changes in dietary practices and nutrition may have exacerbated the health of the poor in both urban and rural areas, although little is known about the pre-1914 diet or cost of living.¹² Measures to collect regularly and consistently statistics on prices and costs of living were not put in place until after the war (South African Year Book No.3, 1919). Afrikaners are thought to have consumed more meat than Africans (Wilson, 1971 p.113) but 'poor whites' are known to have suffered malnutrition and poor dietary habits (van Heyningen, 2004 p.8-10). By the 1920s the problem of diet and nutrition was attracting attention; health officials began to worry a great deal about malnutrition, scurvy, pellagra, rickets and kwashiorkor among Coloureds, Africans and poor whites (Fox, 1934; 1936; Brock and Lasky, 1942; Packard, 1989; Wilson, 1971). Poverty was recognized as the fundamental cause of malnutrition; other influences including population growth, the disruption of semi-pastoral economy and deterioration of productive capacity of rural were recognized (Fox, 1939).

The evidence reviewed above suggests ways in which economic and political changes and racial segregation shaped the disease ecology, mortality and health. Admittedly, the sources are incomplete; they provide little detail of the experience of individuals in different cohorts, locations and racial groupings. A paucity of sources rather than a lack

12. The census of 1910 provides data on the costs of living and food prices in major towns of South African for 1895, 1900 and 1910 but non-white income data are not available.

of ideas or interest limits our ability to analyze the physical well-being of South Africans born into the globalization and mining-based industrialization of the later 19th century.

IV. From Union to Apartheid, 1910-1948

A clearer picture emerges from sources describing the social status and well-being of Coloureds in the four decades after the Union in 1910. We are fortunate to be able draw upon the report of a 1936 commission on the State of the Cape Coloureds (South Africa 1937). This report, which provides the first systematic examination of living conditions for the Coloureds, emphasizes the importance of education and tradable skills and analyzes in some detail the Coloured experience of schooling.

A special curriculum for coloured primary schools had been created in 1923 along the lines of the European schools. This helped to increase enrollments, and yet progress was slow. From 1931 to 1935 Coloured enrollment in Cape Province Standard One increased from 12,570 to 14,835; Standard Two increased from 10,474 to 12,960; Standard Five rose from 3,032 to 4,124.¹³ At each level the number of Coloured students increased, and yet the same data reveals a dramatic attrition from the first to fifth standard. Unlike white children the Coloureds were not compelled to remain in school beyond age 7, and many did not. In Cape Province only 3% of the Coloured who enrolled into Standard Six made it into Standard 10 compared to 20% for whites (South Africa 1937, pp.148-151). Not surprisingly few Coloured schools offered instruction beyond Standard Six.

Even for those who attended school, the absentee rate was higher for Coloured at all levels, as was the median age of pupil. Again, not surprisingly, performance by Coloured students was found to be inferior. A test of conducted among standard three pupils permits a direct comparison. Coloured students scored worse in all disciplines except English spelling.¹⁴ The Commission (pp.192-193) interpreted the evidence of Coloured school performance as a product of poor facilities, lack of teachers and poor teacher salaries rather weak student motivation or innate ability:

The well-known fact might be stressed that the coloured teachers are generally not qualified to the same extent as the average European teacher, and that the training of such teachers was initiated at a comparatively recent date. This fact also explains the phenomenon which can hardly be explained in any other way, viz., that the differences between the two groups are greatest in two of the so-called non-essential subjects (Geography and Nature Study).

The position of Coloured workers in the labour market mirrors the experience of schooling. Several legislative interventions during the 1920s protected white workers at the expense of Africans and Coloureds. Among them were the Industrial Conciliation

13. Similar figures obtain for Transvaal province: Standard 1 enrollment was 933 in 1931 and 1,187 in 1935; Standard 2 increased from 685 to 952 and Standard 5 from 239 in 1931 to 360 in 1935.

14. 454 white children and 180 Coloureds had the following average scores: Afrikaans vocabulary 12.4 whites and 5.8 for Coloureds; Afrikaans reading 14.8 whites and 8.98 Coloureds; Afrikaans spelling 28 for whites and 24.1 Coloureds; English vocabulary 9.04 whites and 6.4 Coloureds; English Reading 12.3 whites and 10.8 Coloureds; English spelling 29.8 whites and 32.1 Coloureds; History 15.1 whites and 11.4 Coloureds; Arithmetic 56.5 whites and 49.2 Coloureds (South Africa 1937 pp. 178-191).

Act of 1924, the Wage Act of 1925 and the Mines and Compensation Act of 1926 (Houghton 1980 p.154; Goldin 1987; South Africa 1937).¹⁵ The Industrial Conciliation Act and the Wage Act prevented competition between whites and Coloureds by restricting the latter from senior positions in the civil service and public transportation sector.¹⁶ In 1921 over 90 percent of Coloured women were unskilled, 87% were classified as domestic servants, less than 5 percent were in skilled and semi-skilled jobs. By contrast 15% of Coloured men occupied semi-skilled and skilled occupations. The latter were disadvantaged by the legislated protection of white workers.¹⁷

The Apprenticeships Act of 1922 and subsequent amendments (1930, 1944) did not impose an explicit racial discrimination, but it laid down conditions for apprenticeship which made it difficult for Coloureds, Africans and even Asians to qualify as skilled and semi-skilled workers (Houghton 1980). For example the Apprenticeship Act stipulated that entry into an apprenticeship required a minimum Standard Six education. In 1927 the entire Cape Province had only 785 Coloured pupils enrolled at this level compared with 13,128 white children (Goldin 1987).

The 'White Labour Policy' and the 'Civilized Labour policy' imposed further restrictions on Coloureds, Africans and Asians during the 1920s.¹⁸ The proportion of Asians employed in Railways and Harbors dropped from 7% in 1916 to 1% in 1936, that of African from 72% to 59%. The share of Coloureds increased slightly from 10% to 11%, while the whites share of jobs increased as intended from 11% to 29% (South Africa 1937, p. 44). The manufacturing sector changed in tandem. By 1932, only 43% of the manufacturing workforce was Coloured, down from 50% in 1924 (Goldin 1987). By 1939 Coloured labourers were greatly diminished among the ranks of urban blacksmiths, carpenters, masons, bookmakers, tailors coachmen and painters) and excluded from the expanding new electrical and metallurgical crafts (Golding, 1987).

Disadvantages in education and the labour market gave rise to profound inequality in physical well-being. The 1936 Cape Coloured Commission reported birth weights for 1763 Coloured and 906 white babies at Cape Town's Peninsula Maternity Hospital 1933-1936. The average weight at birth for the Coloured was 7lb.0.2oz compared to 7lb.6.7 oz. for the whites (South Africa 1937, pp. 87-89). The Commission considered and rejected

15. The Industrial Conciliation Act of 1956 added two new contentious provisions. The principle of job reservation set aside certain jobs would be reserved for certain races or a percentage of workers of a particular race. The principle of enforced racial separation in trade unions banned unregistered unions and those which were open to both whites and nonwhites.

16. Prior to this legislation very few Coloureds held graded positions in the civil service because of educational qualifications and, after the Union, administrative fiat (Marais 1939, pp. 261-263). The Wages Act did not apply to employees in agriculture, to domestic servants and to persons who was covered by the Public or Railways and Harbors services (South Africa 1937, p. 56).

17. Coloureds in commerce were rare. The 1921 census found 3,561 males in commerce insurance and finance (excluding clerks), 292 males as clerks and draughtsmen. The report of the 1936 commission identifies only a few small and struggling shopkeepers. Only 1122 Coloured men and 38 women could be found in the civil service (South Africa, 1937, pp.80-82).

18. The latter used differential tariff duties and preferential government contracts to favour firms employing a high proportion of 'civilized labour' and to replace non-white labour in government service and on the railways.

the relatively smaller stature of the Coloured parents as an explanation for the differential (p. 88).

in a general way, there is no data available to indicate that the main stocks from which the Coloured people, as they are found today, sprang and developed did not possess a good racial heritage from a physical point of view. During the intrauterine life, moreover they possess a certain initial body growth which indicates future physical possibilities in the adults’.

Rather, the Commission identified deplorable living conditions and chronic undernourishment of the parents as being responsible:

these figures would tend to show that given healthy parents, the newly born child possesses an initial asset growth and could be expected under normal conditions to attain good body dimensions and physique at maturity. This expectation is not attained in the large majority of the Coloured people and the figures adduced led decided support to the view that the result is due at least largely if not wholly, to exposure to poor conditions of environment and under-nourishment of which there is ample evidence. ... Until these factors have been eliminated, it could be an unproved statement to maintain that the Coloured people are less robust and physically below the European standard because of the stock from which they spring. In other words, the general observation of comparative physical inferiority cannot be ascribed to heredity or inferior stock, unless it persists after environmental and nutritional deficiencies have been improved or brought up to the standard of the European race..

Recognition of poor nutrition among the Coloured population was sufficiently widespread during the interwar period that many churches, local authorities and charitable organizations provided meals to school children especially in winter months (South Africa 1937, p.90). In spite of these efforts the commission found:

by examination, observation and evidence that there is a prevalence of subnormal growth and weight, poor musculature, inability to stand up to continued physical strain, poor condition of the skin, teeth of poor structure. Many of the school children are anaemic looking and listless and according to the teachers, there is lack of concentration in their school work’.

The Commission went on to identify poverty as a fundamentally important influence on the physical well-being of Coloureds (p.90-91):

In cases in which purchasing power is lacking, deficiencies in diet are most likely to occur in first class (animal) proteins and in minerals and vitamins, because of an insufficient acquirement of dairy produce and green vegetables. In these circumstances, the preponderating factor in malnutrition must be looked for in undernourishment among the larger section of the coloured communities and this is almost exclusively due to poverty ... The fact that the coloured people show through vital statistics...a lower resistance to disease than the Europeans elsewhere in the Union cannot be ascribed to climatic influences or necessarily to hereditary weaknesses. This lower resistance can be explained as being largely due to the relatively poor environmental and over-crowded conditions under

which the majority live and to the greater degree of undernourishment to which they are habitually subjected.

Other sources confirm the impression of poor physical well-being in the Coloured community of the 1920s and 1930s. A Transvaal government enquiry reported in 1934 that “among Non-Europeans, the group which seems to suffer the greatest social and economic disabilities and hardships is the Coloured. There is appalling poverty amongst them, far more than amongst the Natives (cited in Fox, 1936, p. 28). Dr. Fox went on to qualify the comparison by identifying significant pockets of extreme malnutrition amongst Africans (chiefly on the reserves), but he did not question the general characterization of the Coloured community.

Writing shortly after the 1937 Commission report Marais cites the view of the Government Health Officer that Coloureds were the chief sufferers from tuberculosis. The Health Officer apparently attributes this to overcrowding in unsanitary dwellings. Marais (1939 p.259, note 3) countered that ‘Malnutrition is a more important factor’.

The Cape Nutrition Survey undertaken in 1941 provides further evidence with its finding that more than three-fifths of all Coloured were malnourished; the corresponding figures for Africans, whites at middle-ranked schools and whites at a poor school were 43%, 29% and 70% (Brock and Lasky, 1942). The authors of the study suggested that while the results for African schoolchildren was unrepresentative of Africans more generally, and the range of outcomes for whites did not permit firm conclusions, the figure for Coloureds was reliable. Indeed, an accompanying Social Survey of Cape Town concluded that from 48% to 58% of urban Coloureds were so poor that they were highly unlikely to be able to afford adequate nutrition (Brock and Lasky 1942, p. 259).

Partial data from earlier years suggest that the crude death rate among Coloureds was two to three times greater than for whites and that the Coloured infant mortality rate were two to four times as great as the white.¹⁹ In contrast variation across different classes of Europeans was negligible (1936 Commission, p.87). Following publication of its 1937 report the South African government began to collect systematic information on vital events for the Coloured population. The first two decades of mortality data are summarized in Table 2 and Table 3. Infant mortality and life expectancy for Coloureds improved noticeably during the 1940s and 1950s. And yet race differentials also widened as whites improved at a faster pace than Coloureds. In spite of some gains the relative position of Coloured people at mid-century had changed little from the early years of the 20th century.

[TABLE 2 HERE]

[TABLE 3 HERE]

19. For 1935 deaths per 1000 among non-Europeans in Cape Town were 23.7 compared to 10.8 for whites. In Kimberley the rate was 20.1 for Coloureds compared to 12.3 for whites. Port Elizabeth saw 23.3 and 9.24. In Pretoria (Transvaal) the rate were 12.8 and 8.6. In Johannesburg Coloureds had a rate of 27.3 compared to 10.4 for whites (South Africa 1937 p.87). Infant mortality rate per 1000 for non-Europeans in Cape Town was 146.2 compared to 50.4 for whites. Kimberley’s infant mortality for Coloureds was 139.2 compared to 69.3 for whites. In Port Elizabeth the numbers were 192.1 for Coloureds against 90.7 for whites (South Africa 1937, p.87).

V. Evidence of Stature in the South African Forces in World Wars One and Two

Additional evidence of physical well-being is available from the attestation and medical records of men who served in the South African forces of World War One and World War Two. The literature of anthropometric history shows that early life nutrition, deprivation, disease exposure, physical and work environment have an influence on stature or height at all ages. Not surprisingly, stature is correlated with economic growth and general living conditions. Systematic height differences are also identified by occupation, social status, place of birth and other sources of inequality in the biological standard of living. In general, any characteristic of childhood experience that might affect nutrition, disease exposure or energy expenditure has the potential to influence adult stature or height (Cole 2003; Komlos 1998; Steckel 1995, 2008, 2009).

The literature on other populations suggests that genetic endowment affects adult stature on an individual basis but that, as an average for large groups of people, genes explain very little if any of mean stature variation between population. Race may matter, but its effect is more likely to arise from systematic differences in nutrition, living conditions, disease exposure and work than from genetic composition (Margo and Steckel 1982; Bodenhorn 1999; Steckel 1995). The discussion of the previous sections, therefore, leads us to expect powerful differences in stature by race or colour precisely because nutrition, living conditions etc differed systematically by race.

We attempt to examine these influences using individual data collected from attestation forms and medical examinations of men serving in the South African Expeditionary Force (SAEF) 1914-1918 and 1939-1945. These records survive in the South African National Defence Force Documentation Centre. South African units in the 1914-1918 war (WWI) included about 146,000 men, a sizeable enlistment for a country of six million, two-thirds of them native Africans who by and large did not enlist.²⁰ Most military personnel came from the white community which numbered roughly 1.25 million; of these perhaps 350,000 men were of an age and fitness to be able to serve. Hence the military personnel records represent between one-half and one-third of the white males available for military service.

We have examined the attestation papers for all WWI personnel whose surname begins with 'B' and all members of the Cape Coloured Regiment (Table 4). This provides about 9500 observations encompassing South African-born whites and Coloureds as well as foreign-born who enlisted in South Africa (Table 4). A similar proportion of the population served in WWII. The internal organization of files forces us to sample on a different basis for WWII. Here we enter detail from all files found in a random selection of file boxes. The boxes for Coloured military units hold 70 files on average against 30 files in the boxes for white units. We select 25% of boxes for Coloured units and 4%

20. 27000 Africans are known to have enlisted in the South African Native Labour Corps during WWI. Surviving records of this unit do not include information about height.

the boxes for white units. Data entry is not yet complete for WWII; here we are able to report on the analysis of 5500 WWII records.²¹

[TABLE 4 HERE]

Entry into the SAEF is not known to have presupposed a minimum or maximum height or any other requirement apart from being in good health. Indeed, Figures 1 and 2 suggest that that height for both whites and Coloured is close to normally distributed, Nevertheless, because armies elsewhere in the British Empire imposed a minimum height of 63 inches (Britain, Canada) or 64 inches (New Zealand) it seems prudent to assume that in South Africa, as elsewhere, those shorter than 63 inches did not enlist at the same rate as taller men. Consequently for much of our analysis we treat the South African personnel as if they were truncated at the conventional minimum. We examine only those who would have stopped growing and not yet begun to shrink noticeably, ie those aged 21-49 years.

[FIGURE 1 HERE]

[FIGURE 2 HERE]

The personal characteristic of interest, stature, is available from most records measured to the nearest quarter-inch with some heaping the inch and half-inch. Socio-economic descriptions of individual soldiers included literacy (inferred from signatures), occupation, age at enlistment, place of birth/residence, race, year and month of enlistment. It is thus possible to assign a year of birth for almost all observations. We distinguish in the WWI data three decadal cohorts, those born 1865-1880, 1881-1890 and 1891-1900 to reflect the years before gold is discovered and then the rapid industrial transformation of the 1880s and 18890s. We also have three birth cohorts in the WWII data for those born 1890-1909, 1910-1917 and 1918-1929. The proportion of the sample arising from each group is given in Table 5.

[TABLE 5 HERE]

The enlistment records also allow us to identify origin by province and rural/urban locality. The birth place for 63% of WWI whites and 42% in WWII is the Cape; about 90% of Coloureds in both wars were born in the Cape. Participation in the armed forces from the Transvaal expanded very quickly from WWI to WWII. We distinguish rural from urban birthplaces in each of the four provinces.²² The locational detail permits some testing of the influence of socio-economic environment during childhood on adult health.

21. Also present among the WWII records are a number of personnel files for Africans and for white women, which we will examine when data collection is complete for Coloured and White men.

22. The 1911 census showed that there were 55 towns in South African with inhabitants of 2,000 or more persons (South Africa Year Book No. 3, 1919). Marais (1968) and Deacon (2004 p. 37) provide the names of towns during the 19th century; for example Deacon identifies 97 population concentrations that had a resident doctor.

We attempt to capture additional effects of early life household circumstances through the proxy of current occupation (which is presumed to reflect father's occupation due to intergenerational continuity). We allocate the 200 or so occupational titles returned by the recruits into four broad classifications following the 1910 census, Davies (1989) and Carson (2006).²³ Fortunately, the types of jobs recorded in our data are very specific. Highly skilled and merchants are coded as white collar workers. Manufacturing, construction and related trades are classed as skilled workers. The third category of farmers comprises farmers and related jobs. The last group is unskilled or general hands and laborers. Substantial changes in the occupational composition of the white soldiers are visible from WWI to WWII: the proportion of farmers fell markedly and the relative importance of the unskilled group increased by an even larger measure. Almost all of the Coloureds were skilled or unskilled in both wars; the latter were twice as numerous as the former. White collar occupations typically required education, while farmers relied on access to land; Coloureds access to both was greatly limited.

VI. Identifying the Patterns of Inequality in Stature

The plot of height distribution of adult white and Coloured heights by year of birth in Figure 3 illustrates that whites averaged more than two inches taller than Coloureds from the 1860s to the 1920s. Coloured stature among the WWI cohorts appears to have declined slightly relative to whites after 1885. Whites may have grown slightly taller relative to Coloureds again in the post-1900 WWII cohorts. These summary trends make clear that the disparity in adult stature between whites and Coloureds was not tending to diminish over time. Multivariate estimation of the determinants of stature is needed to explore this pattern more finely.

[FIGURE 3 HERE]

The estimations reported in tables 6 and 7 expose competing influences on stature. Columns I and IV in both tables report an analysis of whites and Coloureds jointly. A single dummy variable 'White' captures the simple effect of being white after allowing for all other influences. The Column I model includes the late adolescents who are still growing (with dummy variables to capture the growth) while the Column IV model examines adults only. The estimated height differential rises from 2.0 to 2.6 inches (column I) or from 2.5 to 2.7 inches (column IV). The enormous height advantage of the whites is clear, as is the tendency for their advantage to increase from the WWI cohorts (born 1865-1900) to WWII cohorts (born 1890-1925).

Whites and Coloureds are sufficiently different to recommend separate regressions that do not constrain the independent variables to have exactly the same influence on both groups. Estimating with and without the late adolescents provides useful confirmation that the pattern of results is qualitatively insensitive to this choice. For simplicity we focus on the adult-only models reported in columns V and VI of both tables. In Table 6

23. The 1911 census listed 428 job types divided into 10 main occupational categories (South Africa .1912. Census of the Union of South Africa 1911. Part V- Occupations of the People pp.448-628). Davies (1976 p.68) provides a long list of skilled, supervisory and less skilled jobs that were reserved for whites under the 1904 Labor Importation Ordinance used in the South African mines.

we see no statistically significant tendency for white stature to change across the WWI cohorts although there is a significant increase in Table 7 from those born before 1910 to those born 1910-1917. Among Coloureds, a significant decline in WWI data is visible from the 1880s to the 1890s, with no further change in subsequent WWII cohorts. The divergence visible in Figure 3 is thus confirmed to arise from two sources, declining Coloured stature in the 1890s and increasing white stature in the war decade.

Comparison of the constant in both tables (again, columns V and VI) allows us to compare directly the stature of unskilled recruits born in the rural Cape 1881-1890 and 1910-1917. For this demographic group the gap in stature increased from 1.8 inches to 2.8 inches independently of all other influences.

[TABLE 6 HERE]

[TABLE 7 HERE]

The co-efficients on provincial identifications confirm that, controlling for all other factors, stature was smallest in the Cape and largest in the OFS and Transvaal for WWI whites at any rate. The Natal-born were tallest amongst WWII whites. Provincial differences were less pronounced for Coloureds, although those born in the 19th century Transvaal were particularly short. Those born in urban areas were consistently shorter in both wars and for both racial groups. The height penalty for urban birth is particularly large for the whites born after 1890; the coefficient on WWII cohorts was -.62 against -.36 in WWI cohorts.

The pattern of occupational height differentials follows an expected pattern. In both wars, white farmers and white-collar workers were much taller than the unskilled group. We use the soldier's occupation as a proxy for father's occupation and hence of resource availability and disease exposure in youth. It is possible, of course, that some of the strength of the occupational effect reflects reverse causation, ie taller men migrating into higher status occupation because of the social advantages of height rather than being a pure effect of childhood circumstance. Very few Coloured were farmers or in white-collar posts, however a small stature superiority of skilled over unskilled workers is visible in the WWI data. This effect is still positive for WWII although no longer significant.

We do not estimate with literacy as an independent variable for three reasons. It is not interesting for whites because of near-universal literacy. For Coloureds, unfortunately, a significant proportion of our WWII records do not provide evidence of literacy. Those records which do report signatures, however, suggest a marked increase in literacy among Coloured from 52% of the WWI cohorts to 84% of the WWII cohorts. There is also an interpretative awkwardness with literacy, which signals childhood in a family with greater resources but it also may signal a family that invested in education rather than food or other contributors to net nutrition. The former suggests a positive correlation between height and literacy while the latter suggests a negative correlation. The latter effect, if it is felt, carries the added complication that literacy and stature are determined simultaneously, and yet we have no easy way to implement an appropriate model.

We are able to consider one additional influence, that of membership in the Dutch Reformed church. In itself, of course, church membership has no significance for stature or any other indicator of health outcome. In South Africa during this period, however, the Dutch Reformed church was dominated by white Afrikaners, who are often thought to have had a meat-dominated ie protein-intensive diet. We turn to church membership as a proxy because we have no other systematic evidence of diet. In fact, white members of the Dutch Reformed Church born in the 19th century and serving in WWI were taller. This effect is not visible for Coloured members of the church and the white Dutch Reformed in WWII.

Because the distribution of white and Afrikaner populations across the four provinces differed so much, and the provinces were very different, there is a risk that some race-specific effects may originate from the locational distribution in ways that the regression model cannot easily disentangle. A useful check is to estimate directly on province-specific data. Only the Cape in WWI has a substantial number of both whites and Coloureds. We are not looking for the Cape population to follow exactly the South African pattern because the particularities of the Cape environment may well produce different patterns. At the same time, a strikingly different pattern for which no explanation is available would reduce confidence in our estimation.

[TABLE 8 HERE]

The results, reported in Table 8, largely confirm the patterns of Table 6 albeit with some differences. The simple Coloured height penalty is of a similar magnitude, as is the decline in stature for Coloureds born in the 1890s. Some effects are more pronounced: the urban penalty is larger, as are the differentials for white farmers and white-collar posts. The small Coloured skill premium and the Dutch Reform effect are no longer visible. Whites born before 1880 appear to have been significantly taller, implying a decline to the 1880s cohort. We consider that the Cape results are broadly similar to those of all South Africa and that the differences are both interesting and plausible in the sense that possible explanations come to mind. Accordingly, we view the Cape-only estimation as enhancing rather than diminishing confidence in the integrity of our South Africa-wide estimation.

VII. A Decomposition of Height Differentials

We are able to decompose the differences in average height for Coloureds and whites, and the differences in mean stature between provinces, into the portion originating with the different profiles of individual characteristics and the difference shared across everyone in each group. As is well-known this approach allows us to divide the observed average height between whites and Coloureds into both explained and unexplained portions. We begin with the assumption of a linear relationship between the height of individual i , J_i , and a vector of some determinants of height during the growth stages, W_i .

$$J_i = \alpha + \beta W_i + v_i \tag{1}$$

Eq. 1 allows for the possibility that whites and Coloureds differ in their ability to attain the same height because of variations in socio economic environments. Thus different values of α and β may exist for both whites and Coloureds. If whites and Coloured are divided into two groups according to their height and the mean of the random error ν_i is zero for both whites and Coloureds, the discrepancy between average height of whites and Coloureds can therefore be written as:

$$\bar{J}_{white} - \bar{J}_{colored} = \alpha_{white} - \alpha_{colored} + \beta_{white} \bar{W}_{white} - \beta_{colored} \bar{W}_{colored}. \quad (2)$$

Adding and subtracting $\beta_{white} \bar{W}_{colored}$ on both sides of the Eq.2, yields:

$$\bar{J}_{white} - \bar{J}_{colored} = \alpha_{white} - \alpha_{colored} + \bar{W}_{colored} [\beta_{white} - \beta_{colored}] + \beta_{white} [\bar{W}_{white} - \bar{W}_{colored}] \quad (3)$$

Equation 3 is the Oaxaca decomposition (Oaxaca, 1973) which provides a way to disentangle the effects of true discrimination versus ‘justified’ differences. The authors here seek to focus on the differences between whites and Coloureds and therefore use the decomposition in Eq. 3 rather than focus on the values of individual coefficient estimates.

The three terms on the right side of Eq.3 show the three sources of potential differences in mean height between whites and Coloureds. The first term $\alpha_{white} - \alpha_{colored}$ is any difference in average height that is unrelated to the covariates included in the regression. The second term $\bar{W}_{colored} [\beta_{white} - \beta_{colored}]$ captures differences by race in the impact of particular characteristics. The third term $\beta_{white} [\bar{W}_{white} - \bar{W}_{colored}]$ reveals the extent to which a different set of characteristics for whites and Coloureds, in itself, might affect the average height differential. The same can be done for differences between provinces.

[TABLE 9 HERE]

We implement the Blinder Oaxaca decomposition on South Africa-wide WWI adults (combining whites and Coloureds) with Jann’s (2008) module in Stata 10. We report in Table 9 the mean height by group and their differences. The first panel shows the differences in height by each province and race. For example the mean height for Orange Free State is 68.8 inches and that of other provinces 67.3 resulting in a height gap of 1.5 inches. Analogously, Transvaal is taller by 1.3 inches, but the difference narrows to 0.84 inches for Natal. More importantly, those in the Cape Province are on average shorter than the rest by 1.5 inches. In the final column we see that whites are taller than Coloureds by 2.6 inches.

The bottom panel in Table 9 reports the decomposition of differentials into the effects of endowments, estimate co-efficients and their interaction. For example, the first row in the first column shows that mean increase in height for those in other provinces if they had the same environmental conditions and demographic composition (including race) as in Orange Free State. The coefficient -1.10 suggests that differences in endowments

between Orange Free State and other provinces account for 0.39 inches of the height gap ($1.4-1.01=0.39$). The coefficient on white (final column) suggests that unobserved characteristics between whites and Coloureds account for about 2.1 inches of the height differences ($2.57-0.48=2.09$).

The second row for coefficient shows the change in Coloured heights if we apply the white coefficient to Coloured characteristics. In other words it shows the unexplained variance. It suggests that the mean Coloured height would increase by 2.4 inches if Coloureds had the unobserved characteristics of whites. The final row is the interaction term which measures the simultaneous effect of differences in endowments and coefficients.

We can summarise these results with the observation that Coloureds are shorter in part because of having personal characteristics that would reduce anyone's stature (white or Coloured), but this effect represents only a very small share of the overall height differential. Most of the height differential originates with unexplained differences in the impact of particular characteristics or unexplained differences that are entirely independent of the characteristics examined with these data. The large race differential arises almost entirely from the characteristics and conditions of Coloureds vs whites that, despite our best efforts, we are unable to measure. The discussion in earlier sections of the paper makes clear that these differences are unlikely to reflect race in a genetic or biological sense since the Coloureds shared considerable genetic heritage with the whites as part of their complex and heterogeneous origins. Rather, race-based income disparities, living conditions, nutrition and access to health services during childhood, as discussed above, are likely to be responsible.

The decomposition of differentials by province suggests a somewhat different story. Differences in mean stature by province may be viewed as originating to a greater or lesser extent (depending on province) from all three sources: (i) differing endowments and composition (ii) unobserved characteristics that influence how the endowments affect stature and (iii) the interaction of the first two influences.

VIII. Interpretation

Clearly, stature is only one aspect of human health. Nevertheless it is significant that we find no evidence of increasing stature across the cohorts. During the first quarter of the 20th century populations in other countries saw the beginnings of a secular increase in stature, but apparently not in South Africa. This pattern is consistent with scattered evidence from other sources. The disease and diet implications of rapid urbanization and accompanying economic change was no more favourable to the improvement of human health in South Africa than in other environments during the late 19th century and, apparently, less favourable than in many other locations during the early 20th century (Haines 2004; Steckel 1995; Steckel and Haurin 1994). It is not possible at this point to discriminate among alternate explanatory hypotheses, which might include the health implications of mining-based development, the extraordinary speed with which the Transvaal population expanded, a general hardening of social boundaries or, more

simply, the fact that whites were already very tall and the particular condition of the Coloureds pre-empted significant improvements in health.

Analysis of WWI and WWII enlistment records confirm a sizeable and persistent height differential between whites and Coloureds. This is consistent with the diversity of other evidence examined in earlier sections of the paper. The smallness of Coloured stature suggests the possibility of malnutrition and stunting early in life. Indeed, an experience of stunting followed by some recovery or catch-up would be consistent with the modest stature increase which we observe for Coloureds during their 20s. Nonetheless, any catch-up beyond the age of 21 was quantitatively very small relative to the enormity of the height differential between racial groups. Indeed, there is some evidence across the cohorts of increasing inequality along racial lines in the physical standard of living and an absolute deterioration in the condition of the Coloureds.

The Coloureds differed not for genetics reason but rather because of increasing social and economic isolation from the experience of all but the poorest whites. It is difficult to imagine a race-based group whose identity and experience is so clearly socially constructed rather than being biologically constituted.

The powerful racial divide, whatever its origin, should not distract us from similarities in the forces that drove country South Africans of different races to the mines and towns and that shaped their physical well-being. Many sources of non-white impoverishment, proletarianization and adverse social conditions also created a class of whites who experienced only slightly better conditions. The problem of the 'poor whites' is visible in our data from the strong negative co-efficient for unskilled occupation and also for urban environment. Inequality among whites was marked, just as some Coloureds fared much better than others. It is worth remembering as well the black South Africans who were in the majority but, unfortunately, not represented in our data. It is unlikely that this poor and marginalized population was able to escape the same adverse health effects encountered by Coloureds.

The size of occupational differentials makes clear that the social inequality among whites was of some significance. The Coloured occupational differentials are somewhat muted no doubt because of their clustering in a small number of occupations and our own rather simple classification system. The occupational differentials of course are dwarfed by the effects of race. Indeed, one measure of the remarkably powerful effect of race is to observe that by itself race accounts for several times the effect of occupational differentials (which themselves are of some size).

The regional pattern of height penalty implies some interesting possibilities. From their initial organization the Transvaal and Orange Free State (OFS) adopted policies that were more severely discriminatory than in the Cape to Africans, Asians and Coloureds. An extreme skewing of resources to favour whites is consistent with the provincial dummy variables among WWI cohorts that show whites in the Transvaal and OFS to be much taller and Coloureds much shorter than in the Cape. Interestingly, the white advantage in the Transvaal disappears among WWII cohorts, perhaps because of growing urban disamenities as Johannesburg in particular expanded in advance of public health

investments. The elimination of the Coloured disadvantage to living in the Transvaal (relative to the Cape) is more difficult to explain.

The large size of urban height penalty undoubtedly this reflects the very fast growth of a working class population in Johannesburg and other Transvaal towns and cities. The Coloured population remained substantially resident in the Cape and hence was less exposed to increasing urban disamenities of the Transvaal. Indeed, the Cape-only regression suggests that the Coloureds within the Cape experienced little or no urban penalty. Presumably this implies either that urban Cape Coloureds lived in sufficiently privileged circumstances to offset the usual disadvantages of an urban location or that their rural cousins lived in particular straightened circumstances. Both interpretations are plausible, and each may be correct to some extent.

Any discussion of physical well-being must acknowledge the possibility that dietary customs and other cultural practice may have been influential. Typically we have no way to assess the effect of practices for which we have no systematic measure. It is useful to observe, therefore, the positive correlation between adherence to the Dutch Reformed Church and stature among WWI cohorts. This is consistent with received understandings of the Afrikaner diet. However, if there was a stature-expanding Afrikaner diet, it would appear to have become less widespread among WWII cohorts, ie after 1900.

IX. Conclusion: Post-1948 Apartheid and the Origins of Poverty and Inequality for South Africa's Coloured Population

We began the paper by noting poverty and its effects within South Africa's Coloured population today. It would be entirely reasonable to suspect that legislative and administrative changes introduced by the National Party government elected in 1948 contributed to inequality in South Africa during the second half of the 20th century. The burden of the National Party's attempt to identify and discriminate by race fell particularly heavily on the Coloureds.

The Population Registration Act of 1950 created a national racial register and gave everyone a racial identity card. Among other objectives this register was designed to prevent non-whites from passing into the white community. Most of those who might hope to pass in this way were Coloured. The Immorality Act of 1927 had prohibited unions between Africans and whites but not between Coloureds and whites. An amendment in 1950 followed by a Prohibition of Mixed Marriages Act outlawed, for the first time, marital and non-marital unions between Coloureds and whites (Marquard 1952, pp. 78-79). During the 1950s this legislation was used aggressively to prosecute mixed race unions and to try many tens of thousands of borderline Coloured-white identity at the Population Registration Appeal Board Board (Marquard 1960, 2nd ed., pp. 68-69).

Coloureds had held the franchise to vote (admittedly at a high minimum wealth standard) in the Cape since 1853 and in the Union since 1910. Africans were removed from the common electoral roll in 1936 but in spite of some creeping inequality Coloureds maintained the vote and used it effectively through the 1940s in a large number of Cape constituencies. Legislation first introduced in 1951 eventually cleared substantial

constitutional hurdles in 1956 to remove Coloured voters from the common electoral roll. Henceforth Coloureds would not vote in national elections and, within the Cape, they could vote for only 4 of the 55 representatives (Marquard 1952, pp. 79-80; Villiers 1971). The government made attempts to remove from Coloureds in the Cape the right to vote and to serve on municipal councils (Marquard 1960 2nd ed., p. 71ff).

The Land Act of 1913 had prevented Africans from owning land except in reserves but Coloureds and Asians, at least in the Cape, had continued to be able to own land and live freely until 1950 (Marquard 1952, p. 123). At that point specific residential areas were designated off-limits for Coloureds. The Group Areas Development Act of 1955 then gave the national government authority to overrule municipal authorities in order force property sales and aggressively implement systematic spatial segregation.

These and other changes reflect the legislative tip of the administrative iceberg; the system of apartheid entrenched in the 1950s by the National Party was systematic and thoroughgoing. The new regime greatly affected all non-whites the most immediate impact was felt by the Coloured community because it had the most to lose. Previously Coloured people “were administered on the European side of the colour line” (Marquard 1952, p. 82). That changed between 1950 and 1960 as the status and entitlements of the Coloured population changed dramatically for the worse.

The 1950s policy diminished the entitlements of Coloureds and limited their capacity to escape poverty. Nevertheless, our review of the evidence indicates that any post-1948 deterioration of Coloured well-being was small relative to the profound inequality and challenges facing Coloureds as early as the mid-19th century. Of course, the legal, social and economic consequences of the 1948 election may well have halted tendencies for advancement that Coloureds otherwise might have enjoyed. At the same time, nothing in the 1920s and 1930s experience would have given reason to be optimistic for Coloured advancement, even if the National Party had lost the 1948 election, except insofar as individuals would have found it easier to pass as white.

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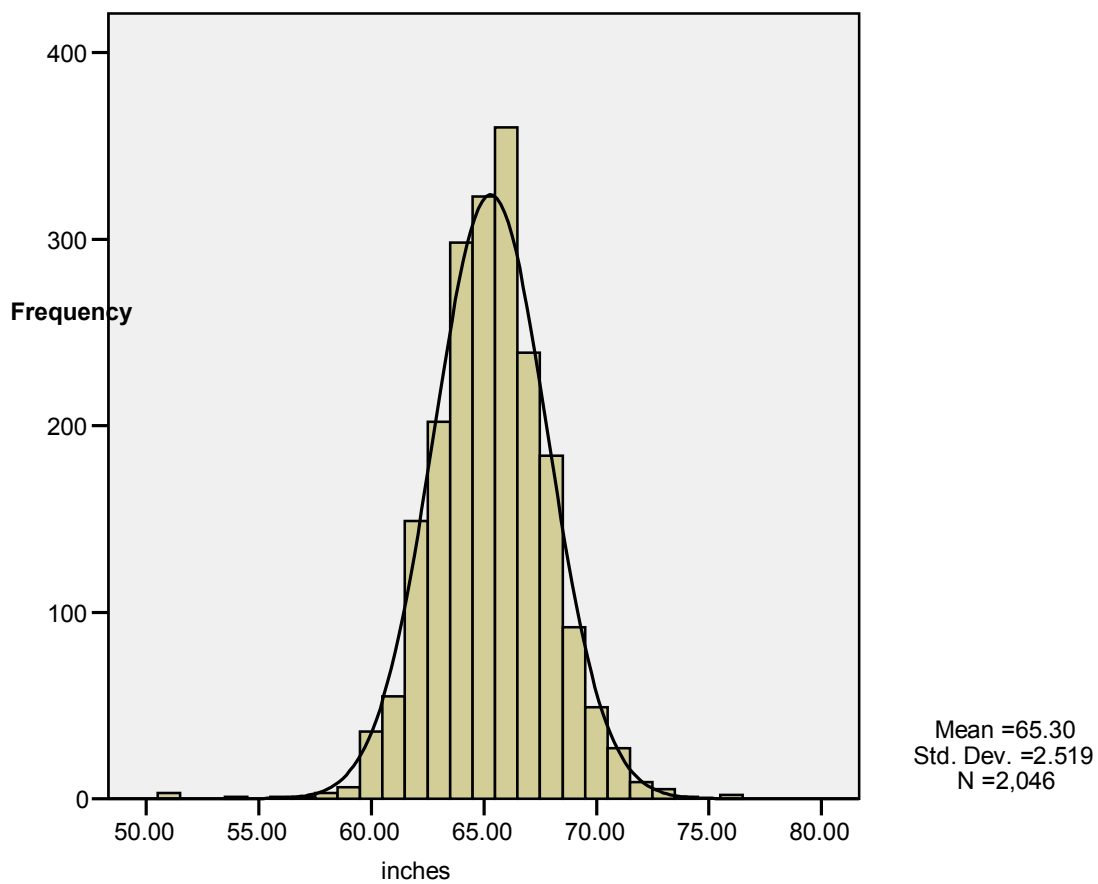
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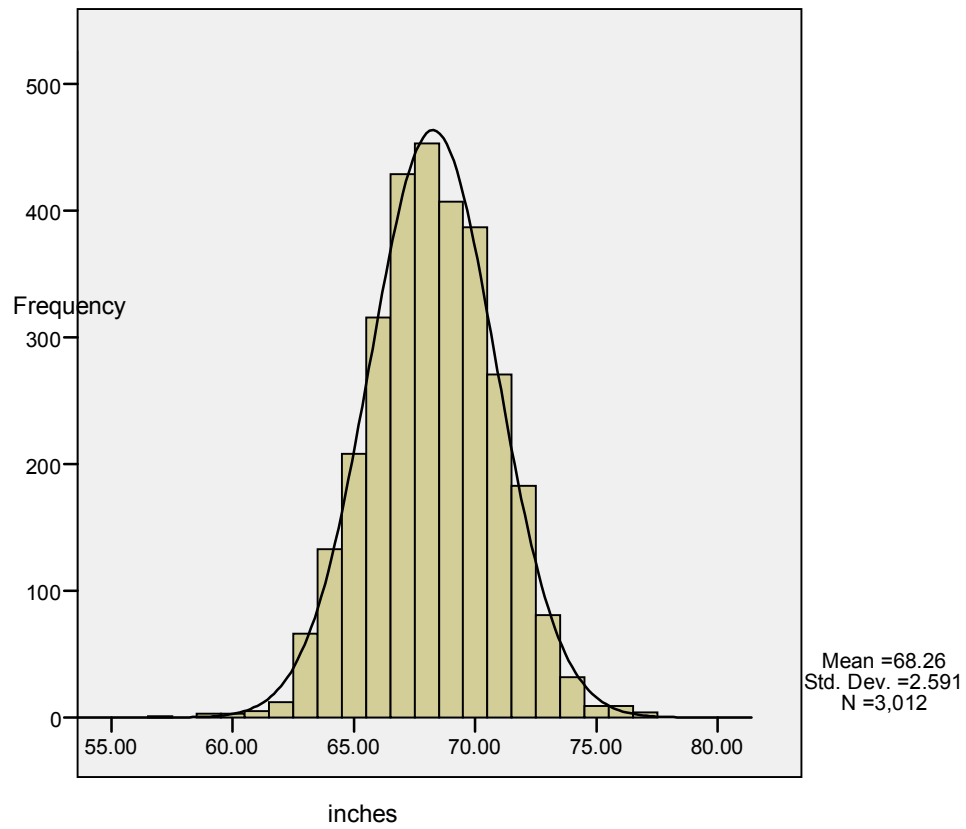
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Figure 1: Frequency Distribution by Size, WWI, Adult Men, Coloureds



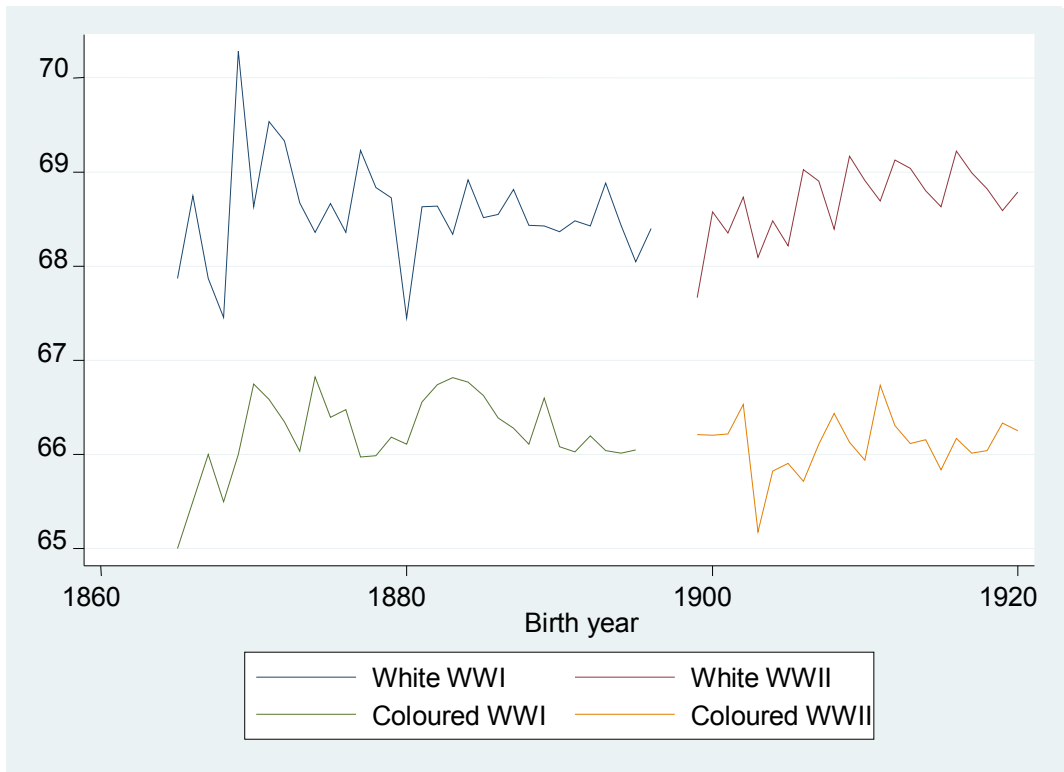
nb – This figure reports those only born in South Africa

Figure 2: Frequency Distribution by Size, WWII, Adult Men, Whites



nb – This figure reports those only born in South Africa

Figure 3: Mean Stature (inches), White and Coloured Adults, WWI and WWII



nb – This figure reports those only born in South Africa

Table 1: Population of South African Provinces, 1865 -1951

	Total	White	African	Asian	Coloured
Cape					
1865	496,381	181,592	----	----	----
1875	720,984	236,783	287,639	----	196,562
1891	1,527,224	376,987	838,136	1,700	310,401
1904	2,409,804	579,741	1,424,787	10,242	395,034
1911	2,564,965	582,377	1,519,939	7,690	454,959
1951	4,427,000	935,000	2,492,000	18,000	982,000
Natal					
1891	543,913	46,788	455,983	41,142	----
1904	1,108,754	97,109	904,041	101,418	6,686
1911	1,194,043	98,114	953,398	133,439	9,092
1951	2,414,000	274,000	1,810,000	299,000	18,000
Transvaal					
1890	----	119,128	----	----	----
1904	1,269,951	297,277	937,127	11,321	24,226
1911	1,686,212	420,562	1,219,845	11,072	34,733
1951	4,813,000	1,205,000	3,484,000	49,000	75,000
Orange Free State					
1880	133,518	61,022	----	----	----
1890	207,503	77,716	----	----	----
1904	387,315	142,679	225,101	253	19,282
1911	528,174	175,189	325,824	108	27,053
1951	1,030,000	228,000	774,000	13,000	15,000

Source: South Africa, *Census of the Union of South Africa 1911*, Part 1 Population and Dwellings (1912) and South Africa, *Union Statistics for Fifty Years* (1960).

Table 2: Infant Deaths per 1000 Live Births, White and Coloured South Africans, 1937-1958

	White	Coloured
1937-1939	52	164
1940-1944	48	163
1945-1949	37	136
1950-1954	34	130
1955-1958	30	133
1980s	13	57
1998	14	31

Source: South Africa, *Union Statistics for Fifty Years*, 1960, B33; Cameron 2003 (for 1980s), Burgard and Treiman 2006 (for 1998, from DHS)

Table 3: Life Expectancy at Select Ages, Coloured and White South Africans, 1920-1952

	males white	coloured	females white	coloured
expectation of life at birth				
1935-1937	58.9	40.1	63.1	40.1
1945-1947	63.8	41.7	68.3	44.0
1950-1952	64.6	44.8	79.1	47.8
expectation of life at age 5				
1935-1937	59.8	50.3	63.3	50.0
1945-1947	62.3	48.8	66.4	50.9
1950-1952	62.8	52.2	67.8	55.1
expectation of life at age 10				
1935-1937	55.4	46.5	58.9	46.3
1945-1947	57.7	44.9	61.7	47.0
1950-1952	58.1	48.1	63.1	51.0

Source: South Africa, *Union Statistics for Fifty Years*, 1960, B48-49

Table 4: Basic Data Description, Military Personnel Records

Description	WWI	WWII
Total observations	9497	5576
Observations foreign born	2281	339
All South African born	7216	5236
South Africans below 21 years	2149	1593
South Africans above 20 years	5069	3643
South Africans above 50 years	13	121
South Africans 21 to 50 years	5056	3522
South Africans 21-50 and ≥ 63 '	268	3473
South Africans 21-50 missing height	21	57
All South African adult coloreds	1790	1190
All South African adult whites	2988	2283
All South African sub-adults	2049	1593
All Sub-adults missing height	30	15
Sub-adults coloreds only	700	257
Sub-adults whites only	1319	1335

South African National Defence Force Documentation Centre, South African Expeditionary Force Personnel Records, 1914-1918 and 1939-1945.

Table 5: World War One and World War Two Full Sample Descriptive Statistics

	White Adults		Colored Adults		White Sub-Adults		Colored Sub-Adults	
	Mean WW1	Mean WW2	Mean WW1	Mean WW2	Mean WW1	Mean WW2	Mean WW1	Mean WW2
Dependent								
Height (Inches)	68.54	68.79	66.11	66.15	67.58	67.8	64.81	65.9
Independent								
B 1865 to 1880	0.164	-	0.126	-	-	-	-	-
B 1881 to 1890±	0.391	-	0.368	-	-	-	-	-
B 1891 to 1900	0.445	-	0.506	-	-	-	-	-
B 1890 to 1909	-	0.213	-	0.322	-	-	-	-
B 1910 to 1917	-	0.249	-	0.295	-	-	-	-
B 1918 to 1929	-	0.440	-	0.281	-	-	-	-
18years	-		-	-	0.338	0.235	0.130	0.272
19years±	-		-	-	0.379	0.191	0.379	0.346
20years	-		-	-	0.282	0.151	0.491	0.335
DutchReformed		0.322		0.091		0.331	0.101	
Born Cape	0.631	0.416	0.946	0.853	0.576	0.440	0.966	0.853
Born Natal	0.091	0.154	0.009	0.034	0.138	0.174	0.009	0.024
Born Transvaal	0.185	0.351	0.027	0.089	0.213	0.322	0.023	0.082
Born O.F. State±	0.093	0.079	0.018	0.023	0.073	0.063	0.003	0.033
Urban	0.551	0.640	0.646	0.508	0.669	0.623	0.723	0.525
White Collar	0.287	0.326	0.027	0.008	0.361	0.501	0.034	0.017
Skilled	0.281	0.240	0.313	0.302	0.297	0.130	0.271	0.177
Unskilled	0.168	0.332	0.636	0.665	0.205	0.301	0.693	0.779
Farmers±	0.223	0.102	0.025	0.025	0.138	0.067	0.017	0.028
Literate‡	0.974	0.99	0.515	0.84	0.990	0.98	0.533	1

Notes: ±Variables omitted during estimation to avoid dummy variable trap

‡Variable not used in all estimations

*All covariates except the dependent variable (inches) are dummy variables.

Table 6: Truncated Regression Analysis of White and Coloured Stature, South Africans in WWI

	I	II	III	IV	V	VI
	All South Africans	All whites	All Coloureds	All adults	All white adults	All coloured adults
1865-1880	-0.031 (-0.31)	-0.007 (-0.06)	-0.176 (-1.07)	-0.063 (-0.52)	0.022 (0.16)	-0.390* (-1.8)
1890-1897	-0.176 (-2.41)	-0.120 (-1.22)	-0.282*** (-2.61)	-0.283*** (-3.3)	-0.098 (-0.92)	-0.629*** (-4.74)
18 years	-0.406 (-1.45)		-0.413 (-1.62)	--	--	--
20 years	0.108 (0.57)		0.142 (0.83)	--	---	--
Above 20 years	1.168*** (7.49)		1.161*** (7.92)	--	--	--
Dutch Reformed	0.220*** (3.01)	0.505*** (4.92)	-0.234** (-2.27)	0.294*** (3.28)	0.534*** (4.8)	-0.269* (-1.83)
Natal	0.110 (0.76)	0.217 (1.35)	0.108 (0.24)	0.133 (0.81)	0.217 (1.23)	0.150 (0.25)
Transvaal	0.396*** (3.73)	0.479*** (3.91)	-0.596** (-2.22)	0.467*** (3.83)	0.517* (3.92)	-0.926** (-2.21)
Orange free	0.563*** (4.04)	0.554*** (3.48)	0.335 (0.93)	0.620*** (3.93)	0.603*** (3.54)	0.469 (1.01)
Urban	-0.296*** (-4.47)	-0.330*** (-3.5)	-0.197** (-2.18)	-0.391*** (-4.81)	-0.363*** (-3.56)	-0.348*** (-2.78)
White Collar	0.430*** (3.99)	0.395*** (2.87)	0.415 (1.53)	0.446*** (3.5)	0.404*** (2.69)	0.519 (1.41)
Skilled	0.137* (1.75)	-0.001 (0.00)	0.221** (2.33)	0.148 (1.48)	0.020 (0.14)	0.261* (2.01)
Agriculture	0.640*** (5.72)	0.470*** (3.32)	0.663** (2.32)	0.609*** (4.67)	0.486*** (3.18)	0.464 (1.26)
White	2.001 (23.59)***	--	---	2.525*** (24.19)	---	---
Constant	65.085*** (384.18)	68.199*** (487.34)	65.205*** (356.38)	65.731*** (566.17)	68.100*** (445.87)	66.272*** (443.83)
Sigma	2.282*** (103.32)	2.429*** (76.79)	2.063*** (69.14)	2.455*** (76.03)	2.509*** (65.41)	2.244*** (40.39)
N	5338	2948	2390	5055	2928	2127

Notes: *t*-statistics in parentheses are significant at the ***=1, **=5 and *=10 percent. Standard errors in all the models were estimated using White's heteroskedastic consistent standard errors.

The omitted age cohort for adults is 1881 to 1890. Omitted age for sub-adults is 19 years. Omitted province is Cape Province and occupation category is unskilled.

Table 7: Truncated Regression Analysis of White and Coloured Stature, South Africans in WWII

	I	II	III	IV	V	VI
	All South Africans	All whites	All Coloureds	All adults	All white adults	All coloured adults
1891_1909	-0.338*** (-2.64)	-0.277** (-2.13)	-0.415 (-1.47)	-0.281*** (-2.5)	-0.286** (-2.15)	-0.273 (-1.37)
1918_1929	-0.021 (-0.15)	-0.0700 (-0.41)	0.120 (0.43)	-0.095 (-0.6)	-0.167 (-0.9)	0.131 (0.47)
18 years	0.738*** (3.56)	0.909*** (3.94)	-0.735* (-1.92)	---	---	---
20 years	0.971*** (4.23)	1.180*** (4.53)	-0.580 (-1.5)	---	---	---
Over 20 years	1.006*** (5.00)	1.188*** (5.16)	-0.388 (-1.17)	---	---	---
DutchReformed	0.211* (1.75)	0.146 (1.04)	0.317 (1.24)	0.161 (1.27)	0.125 (0.89)	0.204 (0.68)
Natal	0.707*** (5.12)	0.758*** (5.14)	0.192 (0.49)	0.663*** (3.87)	0.688*** (3.73)	0.258 (0.55)
Transvaal	0.119 (1.15)	0.122 (1.05)	0.145 (0.59)	0.101 (0.81)	0.083 (0.61)	0.286 (0.98)
Orange Free	0.096 (0.28)	-0.084 (-0.22)	0.909* (2.1)	0.439* (1.99)	0.361 (1.51)	0.694 (1.26)
Urban	-0.242** (-2.45)	-0.468*** (-3.63)	0.006 (0.05)	-0.490*** (-4.36)	-0.623*** (-4.54)	-0.250*** (-1.82)
Whitecollar	0.177 (1.27)	0.166 (1.08)	-0.043 (-0.09)	0.407*** (2.87)	0.366*** (2.41)	-0.386 (-0.54)
Skilled	0.095 (0.8)	-0.033 (-0.23)	0.3562* (1.71)	0.1063 (0.82)	-0.024 (-0.15)	0.352 (1.7)
Agriculture	0.780*** (3.93)	0.756 (3.43)	0.389 (0.88)	0.674*** (3.02)	0.642*** (2.64)	0.414 (0.76)
White	2.648*** (20.87)	---	---	2.657*** (18.55)	---	---
Constant	64.865 (231.3)	67.589*** (207.3)	65.956*** (156.19)	66.092 (486.7)	68.911*** (372.55)	66.053*** (379.17)
Sigma	3.171*** (10.84)	2.976*** (11.46)	3.591*** (4.89)	2.448*** (54.52)	2.490*** (50.19)	2.221*** (22.88)
N	4126	2982	1144	2707	1896	813

Notes: t-statistics in parentheses are significant at the ***=1, **=5 and *=10 percent. Standard errors in all the models were estimated using White's heteroskedastic consistent standard errors.

The omitted age cohort for adults is 1910 to 1917. Omitted age for sub-adults is 19 years. Omitted province is Cape Province and occupation category is unskilled.

Table 8: Truncated Regression Analysis of White and Coloured Stature, Cape-born only in WWI

	I	II	III	IV	V	VI
	All Cape	All Cape Whites	All Cape Coloureds	All Cape Adults	Cape Adult whites	Cape Adult coloureds
1865-1880	-0.029 (-0.23)	0.512*** (2.93)	-0.673*** (-3.66)	0.2183 (1.49)	0.516*** (2.8)	-0.322 (-1.41)
1890-1897	-0.300*** (-3.46)	-0.080 (-0.64)	-0.564*** (-4.67)	-0.405*** (-4.37)	-0.253* (-2.1)	-0.630*** (-4.64)
18 years	-0.473*** (-2.81)	-0.572*** (-2.69)	-0.362 (-1.24)	--	--	--
20 years	0.015 (0.11)	0.014 (0.06)	0.078 (0.4)	---	--	--
Above 20 years	0.458*** (3.91)	0.344** (2.09)	0.587*** (3.54)	--	--	--
Dutch Reformed	0.044 (0.59)	0.050 (0.47)	0.023 (0.23)	0.062 (0.69)	0.097 (0.83)	-0.006 (-0.05)
Urban	-0.374*** (-5.11)	-0.608*** (-5.81)	-0.139 (-1.37)	-0.482*** (-5.6)	-0.670*** (-5.99)	-0.169 (-1.33)
White Collar	0.679*** (6.02)	0.6948*** (5.05)	0.557* (1.84)	0.580*** (4.58)	0.515*** (3.43)	0.545 (1.5)
Skilled	0.214*** (2.59)	0.171 (1.28)	0.232** (2.2)	0.179* (1.75)	0.022 (0.16)	0.308** (2.35)
Agriculture	1.025*** (8.01)	1.030*** (6.68)	0.519* (1.65)	0.918*** (6.55)	0.8495*** (5.13)	0.483 (1.31)
White	2.387*** (29.74)	---	---	2.290*** (23.18)	---	---
Constant	65.391*** (420.00)	67.838*** (297.77)	65.374*** (310.67)	65.954*** (542.87)	68.300*** (414.14)	66.106*** (424.18)
Sigma	2.435*** (102.46)	2.474*** (72.97)	2.376*** (71.93)	2.430*** (71.23)	2.493*** (59.58)	2.242*** (40.22)
N	5249	2662	2587	4694	2599	2095

Notes: *t*-statistics in parentheses are significant at the ***=1, **=5 and *=10 percent. Standard errors in all the models were estimated using White's heteroskedastic consistent standard errors.

The omitted age cohort for adults is 1881 to 1890. Omitted age for sub-adults is 19 years. Omitted province is Cape Province and occupation category is unskilled.

Table 9: Decomposition of Height Differentials by Provinces and Race

	Orange Free	Transvaal	Natal	Cape	Whites
	Estimate	Estimate	Estimate	Estimate	Estimate
Differential					
Variable=0	67.325	67.260	67.367	68.560	65.962
Variable =1	68.820	68.596	68.207	67.071	68.532
Difference	-1.495	-1.336	-0.839	1.489	-2.570
Decomposition					
Endowments	-1.101	-1.399	-0.577	1.074	-0.478
Coefficients	-0.484	-0.355	0.011	0.096	-2.414
Interaction	0.091	0.418	-0.272	0.317	0.322

Source: see text. All differentials and decompositions are statistically significant at the 1% level.