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Education Across Generations in South Africa

By DUNCAN THOMAS*

Racially segregated education was a central pillar propping up the apartheid system in South Africa. The 1953 Bantu Education Act centralized control of black education and linked tax receipts from blacks to public expenditure on their education. In 1975, expenditure on the average white was more than 15 times larger than that on the average black student.

In 1976, the Soweto Riots erupted as students rebelled against apartheid education, and school boycotts ensued through the 1980's. Although resources were shifted toward black schooling, whites continued to enjoy a far better-funded system: in 1989, for example, expenditure on the average white student was R 4 for each R 1 spent on a black. The other two main racial groups in South Africa are Asians, mostly of Indian descent, and mixed-race coloreds. Their education systems also received superior funding: in 1989, the average Asian student had R 3, and the average colored had R 2 spent for every R 1 spent on the average black.

As shown in the first row of Table 1, education levels by race parallel these expenditure patterns. Among men aged 20–70 in 1991,¹ whites are far better educated than Asians, followed by coloreds and then blacks

who have, on average, completed less than half the schooling of whites. The gaps are wider among those men who completed *matric* (required to enter University): they account for over half of white men but only one in 12 black men.

I. Intertemporal Mobility in Education

While these differences are dramatic, they conceal convergence across cohorts, as depicted in Figure 1. The average black man born in the early 1920's completed about 1.4 years of schooling; his grandson, born in the early 1970's, would have completed more than four times that by 1991. Whites in the same cohorts completed 8.8 and 9.8 years of schooling, respectively. By comparison, the schooling levels, and black–white gap, of South Africans born in the early 1970's are roughly equivalent to those of black and white Americans born in the 1930's.

Mean growth rates in educational attainment in Figure 1 are summarized in the second row of Table 1 which is the coefficient estimate from a least-squares regression of education on birth year. The average education of black and Asian men has increased by almost a year in each decade, whereas that of coloreds has risen by only two-thirds as much and that of whites increased one-quarter year each decade. Thus, among those born in the late 1960's, blacks achieved almost the same level of education as coloreds, while Asians are almost as well-educated as whites.

As is apparent in Figure 1, these growth rates have not changed systematically over time, except in the case of blacks. Among blacks, educational attainment of those born in the 1950's and 1960's increased significantly more rapidly than among those born earlier. This is certainly good news and suggests that increased public (and possibly private) investments in education have offset the impact of school disruptions during the 1970's and 1980's.

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¹ A 10-percent random sample was drawn from the public-release version of the 1991 South African Census (which excludes people living in the so-called independent states). Weights are provided that are supposed to adjust for undercounting (thought to be particularly important for blacks). The results are similar whether data are weighted or not; since the basis for the weights is unclear, reported analyses use unweighted data. In the Census, one year of schooling is assigned to anyone who completed Sub-A, Sub-B, or Standard 1. I follow that convention throughout, and so ten years of schooling would be equivalent to completion of high school.

TABLE 1—LEVELS AND GROWTH IN EDUCATIONAL ATTAINMENT OF ADULTS

Variable	Whites	Asians	Coloreds	Blacks
A. Males:				
Mean years of education	9.51	7.82	5.46	3.90
Growth per year (mean)	0.024 (0.001)	0.094 (0.004)	0.066 (0.003)	0.091 (0.001)
Quantile regressions:				
25 percentile	0.048 (0.003)	0.133 (0.005)	0.091 (0.003)	0.033 (0.001)
50 percentile	0.0 (0.003)	0.111 (0.003)	0.069 (0.006)	0.111 (0.002)
75 percentile	0.0 (0.008)	0.051 (0.003)	0.067 (0.003)	0.136 (0.003)
Sample size	14,445	2,402	7,458	29,610
B. Females:				
Mean years of education	9.14	6.44	5.34	3.55
Growth per year (mean)	0.035 (0.001)	0.149 (0.004)	0.073 (0.002)	0.095 (0.001)
Quantile regressions:				
25 percentile	0.053 (0.002)	0.182 (0.004)	0.093 (0.002)	0.0 (0.001)
50 percentile	0.035 (0.001)	0.172 (0.003)	0.074 (0.004)	0.106 (0.001)
75 percentile	0.0 (0.005)	0.121 (0.002)	0.079 (0.002)	0.143 (0.001)
Sample size	15,442	2,570	8,416	31,061

Note: Infinitesimal jackknife and bootstrap standard errors are reported in parentheses.

However, the distribution of this growth has not been uniform. The quantile regressions reported in panel A of Table 1 reflect the growth in educational attainment associated with each year of birth for the bottom quartile, median, and top quartile of the education distribution for each race.² The regressions indicate that, among whites, all the growth in educational attainment has accrued to those at the bottom of the education distribution. Growth for Asians and coloreds is also concentrated among the less educated. But for blacks, the least educated have been largely excluded from the rise in schooling over the last 50 years. Rather, blacks at the top of the

² Standard errors are based on bootstrapped estimates of the variance-covariance matrix with 100 replications. Experiments with replications ranging from 25 through 400 indicate that stability is achieved when the number exceeds 50.

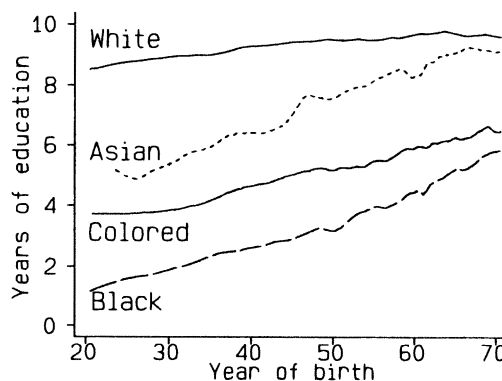


FIGURE 1. MEAN YEARS OF EDUCATION BY YEAR OF BIRTH: MALES

education distribution have benefited most. Black men in the top quartile of the education distribution have completed seven more years of schooling over these five decades, while education of those at the bottom quartile has risen by only 1.5 years.

Educational attainment of women is presented in Figure 2 and panel B of Table 1. In sharp contrast with much of the rest of Africa, the gap in schooling between men and women is small, except among Asians. Asian women born in the 1920's are less well-educated than coloreds and spent far less time at school than Asian men. But because of very rapid growth in their education (about 1.5 years each decade), Asian women born in the late 1960's are almost as well-educated as their brothers, substantially better educated than colored women and almost as well-educated as white women.

Schooling attainment has grown slightly faster for women relative to men in the other three racial groups, and as with men, growth rates have risen most among the least well-educated whites, Asians, and coloreds. But there has been no growth for black women in the bottom quartile, while those at the top of the education distribution enjoyed rapid growth.

In sum, over the last half-century, there has been substantial growth in educational attainment in South Africa as well as convergence across races and, for whites, Asians and coloreds, within race. But, among blacks, the dispersion of education has increased, with a

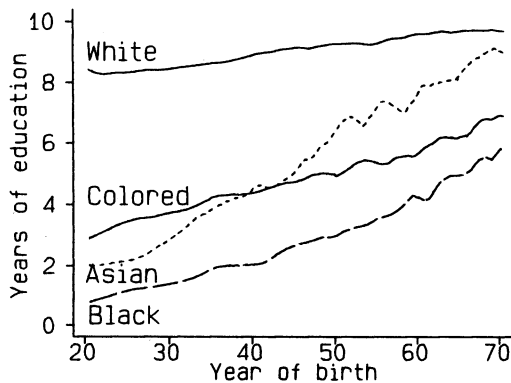


FIGURE 2. MEAN YEARS OF EDUCATION
BY YEAR OF BIRTH: FEMALES

black middle-class emerging, while the least educated have been largely left out in the cold. There is a glimmer of hope in that dismal picture, as increases in education have been spread among *all* blacks born in the 1960's.

II. Intergenerational Mobility in Education

Educational attainment is influenced by both public and private investments, with parental resources being key determinants of child education. To assess the extent of intergenerational mobility in education in South Africa, the influence of parental education on that of their children is examined next.

In a rigid society with no mobility, parents' education fully determines one's own schooling. Among adults aged 20–70 in the 1991/1993 South African Social Stratification Survey,³ one-third of the variation in education of Asians is explained by parental education alone. Controlling for age and gender, maternal and paternal education significantly influences children's education. The effect of paternal schooling is smaller for whites but essentially the same for the other three groups: an additional year of father's education translates into an additional quarter-year of child schooling. An additional year of maternal ed-

ucation has a bigger impact on black and Asian children (0.3–0.4 year) than on whites or coloreds (0.2 year).

Thus, parental education has the biggest impact on children's education among blacks and Asians, the two groups for whom education has risen the most over the last 50 years. Put another way, intergenerational mobility is lowest among them. Nevertheless, increases in educational attainment across cohorts are large in comparison with the impact of parental education: the average education of Asians, blacks, and even coloreds has risen each three or four years by the same amount that would be associated with a parent having an additional year of schooling.

I have also investigated whether mobility has changed across cohorts. Among those born before 1950, intergenerational mobility has been constant, but for more recent cohorts, mobility has increased over time for all, except whites. This suggests a loosening of the rigidity of society in South Africa even before apartheid began to be dismantled.

III. Education and Parents' Preferences

The intergenerational mobility regressions have been reestimated for males and females separately. The impact of parental education is the same for sons and daughters in all but one case (black mothers have a significantly bigger impact on their daughters than on their sons). This result, along with the near-equality of education levels of recent cohorts of men and women in South Africa, suggests that investments in human capital are not allocated differentially to sons relative to daughters. It also seems that these investments are not determined solely by labor-market returns, since women of all races are less likely to participate in the labor market than men and typically earn lower wages when they do work.

In many countries, maternal education has a bigger impact on the human capital of children than does that of the father. In South Africa, the parental-education effects are not significantly different. All of these results are consistent with an interpretation of the South African family as a picture of equality, with all members pooling their income and sharing common goals (and preferences). The results

³ The survey interviewed one (randomly chosen) member from each of nearly 9,000 households in South Africa (see Donald Treiman, 1995).

are also consistent with a diametrically opposed model, in which one member dictates all decisions.

As a first step toward delving inside the family, I test whether these interpretations are consistent with the data. Both models imply that the impact of parental income on child education should be independent of who controls (or earns) that income. Thus, maternal and paternal income should have the same effect on child education. But income is the outcome of a time-allocation choice that involves negotiation among family members and is likely to be related to investments in children and child-rearing. Estimated income effects will be biased because of unobserved heterogeneity.

However, if these choices are fixed within households, then this unobserved heterogeneity will be swept out by including a household fixed effect. Of course, this also sweeps out the main effect of income on child education. However, it is possible to consistently estimate the *differential* impact of maternal and paternal income on the education of sons, relative to daughters, under the assumption that the association between unobserved heterogeneity and parental income is independent of the child's gender. (Estimates are consistent if income is measured with error as long as that error does not vary with child gender.)

If a mother places equal value on investments in sons and daughters, the impact of her income on children's education will be the same irrespective of their gender. The first row of Table 2 reports maternal income effects on sons, relative to daughters, for children aged 7–15 in the 1991 Census.⁴ A negative coefficient indicates that maternal income has a bigger effect on daughters, relative to sons. Thus, Asian and white daughters benefit sig-

TABLE 2—EFFECT OF PARENTAL INCOME ON EDUCATION OF CHILDREN: DIFFERENTIAL IMPACT ON SONS, RELATIVE TO DAUGHTERS

Independent variable	Regression coefficients			
	Whites	Asians	Coloreds	Blacks
Mother's income	−0.030 (0.013)	−0.144 (0.038)	0.013 (0.028)	−0.016 (0.026)
Father's income				
Below 75 percentile	−0.020 (0.017)	−0.069 (0.048)	−0.238 (0.086)	0.060 (0.043)
Above 75 percentile	−0.050 (0.035)	0.194 (0.091)	0.056 (0.042)	−0.051 (0.034)
<i>Difference-in-difference F tests:</i>				
Lower-income	0.23 (0.64)	1.47 (0.23)	6.83 (0.01)	2.53 (0.11)
Higher-income	0.30 (0.59)	8.17 (0.00)	0.77 (0.39)	0.58 (0.45)
All income	0.24 (0.79)	4.17 (0.02)	3.74 (0.02)	1.72 (0.18)
Sample size	4,538	1,134	3,448	18,110

Notes: Infinitesimal jackknife standard errors are reported in parentheses below the coefficient estimates; *p* values are reported in parentheses below the *F* statistics. Regressions include household fixed effects.

nificantly more than their brothers from higher maternal income.

If mothers and fathers pool income, then paternal income should also have a bigger impact on these daughters. This may be true among whites, but it is not among Asians. In fact, in Asian households where the father's income is in the top quartile, his income effects are bigger on sons, relative to their sisters. Moreover, among coloreds, paternal income tends to have a bigger impact on daughters (for those whose father's income is in the bottom three quartiles).

To test whether households pool income, it is necessary to test whether the impact of maternal income on sons, relative to daughters, differs significantly from the impact of paternal income on sons, relative to daughters. These "difference-in-difference" tests are reported in the bottom panel of the table. They are significant for both Asians and coloreds, and so I conclude that income-pooling does not characterize those households. Whether white and black households are run by a dictator or whether all members share the same preferences remains to be investigated.

⁴ In addition to a household fixed effect, each regression includes maternal and paternal education and income, all interacted with a child gender dummy. Dummies for child's age (in years), gender, and interactions among them are also included. Income is not distributed symmetrically; I have taken square roots (a reasonably close approximation to a logarithmic transformation). A spline captures nonlinearities in paternal income effects, with a knot at the third quartile of race-specific income.

IV. Conclusions

Educational attainment of blacks, Asians, and especially Asian women, has risen substantially over the last half-century in South Africa. The least-educated blacks have benefited little from this growth (except among most recent cohorts), although there is some evidence of increasing intergenerational mobility over time, particularly recently. For Asians and coloreds, household investments

in children's human capital appear to be the outcome of a complex process involving negotiation between parents with different preferences.

REFERENCE

- Treiman, Donald J.** "On the Backs of the Blacks: Apartheid and Afrikaner Upward Mobility." Unpublished manuscript, Department of Sociology, UCLA, 1995.