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**A Brief Note on the Relationship between Socioeconomic Status and Test Performance among Ugandan Primary School Children**

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# A BRIEF NOTE ON THE RELATIONSHIP BETWEEN SOCIOECONOMIC STATUS AND TEST PERFORMANCE AMONG UGANDAN PRIMARY SCHOOL CHILDREN<sup>1</sup>

STEPHEN P. HEYNEMAN

PREVIOUS INVESTIGATIONS into the patterns associated with educational attainment in Africa closely parallel findings from the United States: children of better educated parents and "dominant" ethnic groups are over-represented in comparison to their proportion in the population.<sup>2</sup> We do not know as yet exactly why this should occur, but there appear to be three possibilities: one has been researched, the second has not yet been investigated, while this study has begun to examine the third.

First, differential representation might occur because of differential spatial diffusion of schools.<sup>3</sup> Second, some individuals or groups might be better represented because schooling is expensive in both direct and opportunity costs, and the paying of school fees differs according to wealth and willingness. But third, over- or under-representation could occur because of differing abilities to perform academically on the national selection examinations which is used as the criterion for the trickle of movement between the primary, secondary, and tertiary sectors.

Ample evidence exists from industrial societies which would lead one to suspect that children of lower socioeconomic backgrounds might perform less well on tests of academic achievement.<sup>4</sup> In sum, of all the variables in-

<sup>1</sup>I am indebted to individuals at the National Institute of Education at Makerere University and the Comparative Education Center at the University of Chicago for support and substantive criticism. In addition, I am indebted to the Social Research Group at George Washington University for its kind assistance.

<sup>2</sup>Philip Foster, *Education and Social Change in Ghana* (Chicago: University of Chicago Press, 1965); Philip Foster and Remi Clignet, *The Fortunate Few: A Study of Secondary Schools and Students in Ghana and the Ivory Coast* (Evanston: Northwestern University Press, 1966); C. Arnold Anderson, Mary Jean Bowman, and Jerry B. Olson, *Students, Teachers, and Opportunity Perceptions in Kenya 1961-1968* (Washington, D.C.: United States Department of Health, Education, and Welfare, 1969); and Janice Currie, "Stratification in Uganda: Schooling and Elite Recruitment," *Graylands Educational Journal* 9 (1974), pp. 26-42.

<sup>3</sup>W.T.S. Gould, *Planning the Location of Schools: Case Studies, Ankole District, Uganda* (Paris: UNESCO, International Institute for Educational Planning, 1973); Marjorie Jane Mbilinyi, "The Decision To Educate in Rural Tanzania," (Ph.D. diss., University of Dar Es Salaam, 1972); and C. Arnold Anderson, "Patterns and Variability in the Distribution and Diffusion of Schooling," in C. Arnold Anderson and Mary Jean Bowman, eds., *Education and Economic Development* (Chicago: Aldine Publishing Company, 1966).

<sup>4</sup>Frederick Mosteller and Daniel Moynihan, "A Path Breaking Report: Further Studies of the Coleman Report," in Frederick Mosteller and Daniel Moynihan, eds., in *On Equality of Educational Opportunity, Papers Deriving from the Harvard University Faculty Seminar on the Coleman Report* (New York: Vintage Books, 1972), pp. 3-69; James S. Coleman, *et. al.*, *The Equality of Educational Opportunity* (Washington, D.C.: United States Department of Health, Education, and Welfare, 1966); Samuel Bowles and Henry M. Levin, "The Determinants of Scholastic Achievement—An Appraisal of Some Recent Evidence," *Journal of Human Resources* 3 (Winter, 1968), pp. 3-33; Thorsten Husén, "Talent, Opportunity, and Career: A Twenty-six Year Follow-Up," *School Review* 76 (June, 1968), pp. 190-209; Dael Wolfe, "Economics and Educational Values," in S.E. Harris, ed., *Higher Education*

cluded on studies of scholastic achievement, the attempt to quantify the effects of social privilege is perhaps more consistently correlated with test performance than any other education measure—either in or out of school.

The evidence from less industrialized societies appears more equivocal. Bacchus finds that among a self-selected group of British Guianan children sitting for an examination to allocate free secondary school places, children of white collar workers receive almost double their "share," while children of farmers or manual laborers receive less than half.<sup>5</sup> Farrell and Schiefelbein report a correlation of 0.35 between social backgrounds of children in Chile and their scores on a math and a verbal test consisting of synonyms, antonyms, sentence completion and reading comprehension. However, the impact of the Chilean relationship diminishes in the context of a regression.<sup>6</sup> Manley in his study on Jamaican children, finds that although pupils from the lower occupational backgrounds perform poorly, they perform worse on I.Q. tests and tests of verbal ability than they do in mathematics.<sup>7</sup>

The evidence from Africa is the most deviant from what one would expect given the findings from industrialized societies.<sup>8</sup> Although Silvey, in a small Ugandan study, reports a "marked tendency for sons of high socio-economic parents to perform well on a test of mental alertness," he later asserts that parental education was not related to scholastic achievement performance in "any meaningful way." Currie reports an almost random correlation between paternal socioeconomic status and Ugandan secondary school performance in the years 1954, 1959, and 1964. Murphree, reporting from Rhodesia, finds higher performance from children of illiterate homes than from the children of the more privileged. Additional low, or random correlations have been reported from Kenya both at the secondary and at the primary levels. In a review of the recent literature, Alexander and Simmons go so far as to suggest that the influence of socioeconomic status on academic achievement may be smaller in the lesser developed societies.<sup>9</sup>

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in the United States: *The Economic Problem* (Cambridge: Harvard University Press, 1960), pp. 178-180; Christopher Jencks, et. al., *Inequality: A Reassessment of the Effect of Family and Schooling in America* (New York: Basic Books, 1972); G.F. Peaker, *The Plowden Children, Four Years Later* (London: Foundation for Educational Research in England and Wales, 1971); and Peter H. Rossi, "Social Factors in Academic Achievement: A Brief Review," in A.H. Halsey, Jean Floud, and C. Arnold Anderson, eds., *Education, Economy, and Society* (New York: The Free Press of Glencoe, 1961).

<sup>5</sup>M.K. Bacchus, "The Social Factors Affecting Secondary School Selection in British Guiana," *Social and Economic Studies* (March 15, 1966), pp. 40-53.

<sup>6</sup>Joseph B. Farrell and Ernesto Schiefelbein, "Expanding the Scope of Educational Planning: The Experience of Chile," (paper presented at the Meeting of the International Society of Educational Planners and the American Association for the Advancement of Science, Mexico City, June, 1973).

<sup>7</sup>M.K. Manley, "Mental Ability in Jamaica: An Explanation of the Performance of Children in the Jamaican Common Entrance Examination," *Social and Economic Studies* 12 (March, 1963), pp. 51-72.

<sup>8</sup>These "deviant" findings might also be extended to New Guinea. See Alan Pope and John Jones, "Home Background as a Determinant of Success in a Papua New Guinea High School," *Educational Research Unit Report Number 11*, (University of Papua and New Guinea, June, 1974).

<sup>9</sup>Jonathan Silvey, "Testing Ability Tests: Issues in the Measuring of Abilities Among African School Boys," East African Institute for Social Research, 1963 (mimeographed);

## SOCIOECONOMIC STATUS MEASURES AND ACADEMIC ACHIEVEMENT

To test this question further, I took a sample which consisted of a random selection of sixty-seven primary schools from five diverse districts (North and South Karamoja, West Buganda, Bugisu, and Toro), and all three urban areas in Uganda (Kampala/Entebbe, Mbale/Tororo, and Jinja). These schools represent 10.7 percent of all the schools, and 12.6 percent of all the seventh grade pupils from the sample districts.<sup>10</sup>

I elicited information from each child on his parents' education, occupation, and the number of possessions found in his home from a pre-tested list of "modern" consumer items.<sup>11</sup> These variables were also placed in a summary socioeconomic scale. Occupation was measured by asking each child individually the following question: "How does your father earn money?" But since many fathers earned money performing a variety of tasks (fishing, raising goats, and repairing bicycles, for example), each of these tasks was noted. Later, each was coded into five levels of remuneration,<sup>12</sup> and the child's father was assigned to the highest level of his sometimes multiple occupational endeavors.<sup>13</sup>

These data indicate that there is no relationship between any of these measures of a child's socioeconomic background and his total academic achievement score on the National Primary Leaving Examination (Table 1). The correlation between academic achievement and paternal education at-

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Jonathan Silvey, "Long Range Prediction of Educability and Its Determinants in East Africa," in L.J. Cronbach and P.J.D. Drenth, eds., *Mental Tests and Cultural Adaptation* (Paris: Mouton Publishers, 1972); Janice Currie, "Stratification in Uganda: Schooling and Elite Recruitment," *op.cit.*, Betty Jo Murphree, "Factors Influencing the Aspirations and Achievement of African Secondary School Pupils in Rhodesia," in *ASSA Sociology Southern African 1973, Papers from the First Congress of the Association for Sociologists in Southern Africa* (Durban: University of Natal Multi-Copy Centre, 1973); Jerry B. Olson, "Educational Change in Kenya: 1961-1968" (Ph.D. diss., University of Chicago, 1974); Dingiuri N. Mwaniki, "Education and Socio-Economic Development in Kenya" (Ph.D. diss., Stanford University, 1973); Mbo Kubeta Mwaniki, "Relationship Between Self-Concept and Academic Achievement in Kenyan Pupils" (Ph.D. diss., Stanford University, 1973); and Leigh Alexander and John Simmons, "The Determinants of School Achievement in Developing Countries: The Educational Production Function as an Analytical Tool," International Bank for Reconstruction and Development, Bank Staff Working Paper, 1974.

<sup>10</sup>Stephen P. Heyneman, "Academic Achievement in Uganda: A 'Coleman Report' From a Non-Industrial Society" (Ph.D. diss., Comparative Education Center, University of Chicago, June, 1975).

<sup>11</sup>The items consisted of the following: bed, newspaper, bicycle, radio, clock, motorcar or lorry, camera, and television.

<sup>12</sup>Original work was done on occupational categories in Uganda by T. Wallace and Sheldon G. Weeks, "How to Operationalize Concepts of Social Stratification: Some Crucial Questions for Discussion," East African Universities Social Science Conference, Paper 87, December, 1972 (mimeographed).

<sup>13</sup>The sample's representativeness assured that each SES measure contained the full range of between five and eight categories. With the measure of modern possessions, there were some children who came from homes with none of those listed, while there were other cases in which the family possessed all of them—including a car and a television set. The mean was very close to owning half. Of all the SES measures, the least variance was found with mother's educational attainment. Yet with even this measure, 57 percent of the pupils reported having mothers who had some schooling, from a few years all the way up to university. Thus, each measure of SES contained more variance, for example, than would the variable sex — which is a very significant predictor of academic performance. Insufficient variance is not an explanation for the lack of relationships reported below.

TABLE 1. CORRELATION COEFFICIENTS BETWEEN SOCIOECONOMIC STATUS AND ACADEMIC ACHIEVEMENT

N=2293

Mother's Education	.02
Father's Education	.07
Father's Occupation	.06
Possessions in the Home	.03
Summary Socioeconomic Status <sup>a</sup>	.05

<sup>a</sup>Summary socioeconomic status: computed by summing each child's mother's and father's educational attainment, the reported number of possessions in the home, and the reported paternal occupational status category.

ainment was only .07; between achievement and maternal education attainment .02; with the number of modern possessions reported in each pupil's home only .03; with paternal occupation only .06; and with the summary measure of the four socioeconomic status variables only .05. The fact that a child comes from a "privileged"<sup>14</sup> background in which his parents have received more formal education, or in which his father has a better paying, more secure income, or in which his home contains a greater number of modern possessions, does not necessarily mean that a child will score better on a test of academic achievement.<sup>15</sup>

#### DIFFERING ACHIEVEMENT MEASURES: DIFFERING RELATIONSHIPS WITH SOCIOECONOMIC STATUS

To explore the question of relativity in measures of performance, we obtained a score for each child on a non-verbal group test of intellectual and perceptual aptitude. We chose the Raven's Progressive Matrices (RPM) because of the careful work already done on its reliability<sup>16</sup> and because of its wide utilization in non-industrial societies.<sup>17</sup>

<sup>14</sup>"Advantaged" or "privileged" here are used as terms relative to Ugandan society. We do not mean to imply that children of "privileged" backgrounds are the children only of the most rich. We use the term to indicate a continuum; that they are children of parents who, through above average attainment, have achieved "privileged" status.

<sup>15</sup>Because less than 10 percent of the age cohort reaches grade seven in the Karamoja Districts and more than 90 percent in the capital of Kampala, one might wonder if this wouldn't influence the findings. But no relationships emerge either within Karamoja or within Kampala.

<sup>16</sup>Jonathan Silvey, "Preliminary Thoughts on Aptitude Testing and Educational Selection in East Africa," East African Institute for Social Research, 1962 (mimeographed); Jonathan Silvey, "Testing Ability Tests: Issues in the Measuring of Abilities Among African School Boys," *op.cit.*; Jonathan Silvey, "Aptitude Testing and Educational Selection in Africa," *Rhodes-Livingston Journal* 34 (1963), pp. 9-22; W.D. Wall, "Review of Tests A, Ab, and B," in O.K. Buros, ed., *Fourth Mental Measurements Yearbook* (Highland Park, New Jersey: Gryphon Press, 1953); Morton Bortner, "Review of the Raven's Progressive Matrices," in O.K. Buros, ed., *Fourth Mental Measurements Yearbook* (Highland Park, New Jersey: Gryphon Press, 1965); David Wechsler, "Review of the Raven's Progressive Matrices," in O.K. Buros, ed., *Sixth Mental Measurements Yearbook* (Highland Park, New Jersey: Gryphon Press, 1965); and T.J. Keating, "Review of the Raven's Progressive Matrices," in O.K. Buros, ed., *Sixth Mental Measurements Yearbook* (Highland Park, New Jersey: Gryphon Press, 1965).

<sup>17</sup>Edgar A.F. Bowden, "Perceptual Abilities of African and European Children Educated Together," *Journal of Social Psychology* 72 (1969), pp. 204-215; E.L. Klingelhofer, "Performance of

TABLE 2. CORRELATIONS BETWEEN SOCIOECONOMIC MEASURES  
AND FOUR MEASURES OF PUPIL PERFORMANCE

N=2293

	Raven's Progressive Matrices	English Language	Mathematics	General Paper <sup>b</sup>
Mother's Education	.08 <sup>a</sup>	.12 <sup>a</sup>	.02	-.05
Father's Education	.10 <sup>a</sup>	.17 <sup>a</sup>	.04	.00
Father's Occupation	.11 <sup>a</sup>	.17 <sup>a</sup>	.04	-.01
Possessions in the Home	.12 <sup>a</sup>	.11 <sup>a</sup>	.03	-.05
Summary Socioeconomic Status	.13 <sup>a</sup>	.16 <sup>a</sup>	.04	-.03

<sup>a</sup>Significant at the  $p < .001$  level.<sup>b</sup>History, geography, and general science.

Uganda's Primary School Leaving Examination consists of three separate sections dealing with mathematics, general knowledge (history, geography, and general science), and English. Each section, respectively, carries equal weight (100 points) in the total score (300 points), and requires very different intellectual and verbal skills. When the total score is broken down into its three independent components and each correlated separately with socioeconomic status, a pattern begins to emerge. Although the coefficient of mother's education with Mathematics achievement was only .02 and with the General Paper it was actually -.05, it increased to .12 when correlated with the section on English Language. Similarly, father's educational attainment was not correlated with Mathematics achievement (.04) nor with the General Paper (.00), but also increased to .17 when related to English Language. Father's occupation, the number of modern possessions found in the home, and consequently, the summary socioeconomic status scale demon-

Tanzanian Secondary School Pupils on the Raven's Standard Matrices Test," *Journal of Social Psychology* 72 (August, 1967), pp. 204-215; S.H. Irvine, "Some Practical and Theoretical Problems of General Ability Testing at the African Standard Seven Level in Southern Rhodesia," East African Institute for Social Research, 1963 (mimeographed); S.H. Irvine, "Towards a Rationale for Testing Attainments and Africa," *British Journal of Educational Psychology* 36 (1966), pp. 24-29; S.H. Irvine, "Factor Analysis of African Abilities: Constructs Across Cultures," *Psychological Bulletin* 71 (January, 1969), pp. 20-32; S.H. Irvine, "Figural Tests of Reasoning in Africa: Studies in the Use of the Raven's Progressive Matrices Across Cultures," *International Journal of Psychology* 4 (1969), pp. 217-228; Mallory Woher, "The Meaning and Stability of Raven's Progressive Matrices Test Among Africans," *International Journal of Psychology* 4 (1969), pp. 229-235; P.E. Vernon, "Abilities and Educational Attainment in an East African Environment," *Journal of Special Education* 1 (1967), pp. 335-345; P.E. Vernon, "Administration of Group Intelligence Tests to East African Pupils," *British Journal of Educational Psychology* 31 (1967), pp. 282-291; P.E. Vernon, "Abilities and Educational Attainments in an East African Environment," in Douglas Richard Price-Williams, ed., *Cross-Cultural Studies* (Baltimore: Penguin Books, 1970); Uma Sinha, "The Use of the Raven's Progressive Matrices in India," *Indian Educational Research* 3 (1968), pp. 75-88; A. Ombredane, "Principes pour une etude Psychologique des noires du Congo Belge," *L'Annee Psychologie* 50 (1951), pp. 521-547; L. Berlioz, "Etudes des 'progressive matrices' faites sur les Africains de Douala," *Bulletin Centre de Recherches Psychotechnique* 4 (1955), pp. 33-44; S. Biesheuvel, "Psychological Tests and Their Application to Non-European Peoples," in Douglas Richard Price-Williams, ed., *Cross-Cultural Studies* (Baltimore: Penguin Books, 1970); and Michael O.A. Durojaiye, "Is the Concept of African Intelligence Meaningful?" in *East Africa* 7 (1971), pp. 4-13.

strate a similar pattern. Each of these in addition to relationships with the RPM are illustrated in Table 2.

Although the relationship between socioeconomic status and the total achievement score is non-existent (Table 1), when achievement is broken down into its separate components there emerges a small but consistently positive and statistically significant relationship with performances on the English Language section and on the Raven's Progressive Matrices. No relationship ever emerges with either Mathematics or achievement in General Knowledge.

In future investigations for the causes of social over-representation in secondary schools the answer will probably not lie in differential scholastic achievement. Because Primary Leaving Examination scores are correlated with socioeconomic status only on the English Language section, if differential achievement is a cause of differential representation, it is due to this section of the examination.

However, the correlations between socioeconomic status and even the English Language section are weak; they are no stronger than the correlations with performance in perceptual ability—a task widely reputed to be less related to cultural environment than academic achievement.<sup>18</sup> Therefore, investigators would be more likely to find stronger reason for differential representation in the relative inability of the lesser privileged to enter a school, or to pay school fees, than in their capacity to perform well on the standarized test used for selection.

<sup>18</sup>George Westby, "Progressive Matrices Sets A,B,C,D, and E, 1938: A Review," in O.K. Buros, ed., *Fourth Mental Measurements Yearbook* (Highland Park, New Jersey: Gryphon Press, 1953); and Henry R. Burke, "Raven's Progressive Matrices: A Review and Critical Evaluation," *Journal of Genetic Psychology* 93 (1958), pp. 218-228.