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THE WORLD BANK

December 1975

Schooling for Development?
Students and Workers in Tunisia

John Simmons with Sumru Erkut*

*Boston University

Population and Human Resources Division
Development Economics Department
Project RPO 291

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Discontent is the first step in the
progress of a man or nation.

Oscar Wilde

Preface

That formal schooling is essential for individual improvement and national development is a fundamental belief shared by most educated and many uneducated people in the world. What exactly schooling does, and why, are not always substantiated by scientific analysis. This book investigates two notions related to these issues: First, why do some students learn more than others? Second, to what extent does this additional learning contribute to the earnings of workers?

A writer who had a great dislike for Winston Churchill decided to substantiate his feeling by doing an "honest" biography of the man. After completing his research, he wrote two volumes of praise instead. When we started this research six years ago, we had no convictions about the subject except for its importance in economic planning. It is only after completing the work that we have become convinced that the popular assumptions about schooling and development need to be thoroughly questioned. Our understanding of the role of schooling in development is still inadequate, but there is a growing volume of published support for my doubts, which are symbolized by the question mark in the title of this book. The fact that Churchill had so little success in school and learned so much outside its walls should not be lost on the reader.

Sumru Erkut joined the study after the data had been collected and thus can share no responsibility for the deficiencies in the design. She brought insight to the analysis of the data, the skills of a social psychologist and the sensitivity of someone born and raised in a Mediterranean society. She wrote chapter 5. It is our great regret that we did not start the project together.

The acknowledgments are extensive because of the large number of individuals both in Tunisia and the United States who have assisted, but they cannot be all mentioned for lack of space. Chedly Ayari, Abdelkader Zghal, and other members of the Center d'Etudes et Recherche Economique et Sociale provided moral and expert support. Ahmed ben Salah and other officials in the Ministries of Plan, Education, and Foreign Affairs initially welcomed the project and aided its progress. The Peace Corps kindly permitted one of its volunteers to participate for a limited time. And without the interest and assistance of countless students, workers, teachers, and local officials, there would be no study. The assistants who organized and carried out the interviewing and initial data processing were Ann Hammons, Elizabeth Mayer, Susanne Micaud, Hamouda Hanafi, Mohammed Riza, Mohamad Ayad, Carole Steere, and Rita Cascio. Lewis Koppel programmed the computations. From the beginning the advice of many friends and colleagues was essential, particularly that of David Kinsey, Samuel Bowles, Herbert Gintis, Mark Blaug, Mary Jean Bowman, Zvi Griliches, H.B. Young, and Gino Tesi.

The research was sponsored by the Harvard University Research Project in North Africa. The North Africa Project was established in 1963 by A.J. Meyer and John C. Snyder to coordinate research in social and medical sciences. To them I owe a special debt of gratitude for inviting our participation. Sources of funding included the United States Agency for International Development and the Ford Foundation.

Timely financial support was also provided by the Center for Middle Eastern Studies, the Center for Studies in Education and Development, and the Development Research Group, all of Harvard University. The World Bank also contributed. Alison Hanham and Judith Higgins pruned the prose. Sharon Cronon, Judith Parker, and Jenny Tarlin typed the unending drafts of manuscript. We are grateful to them.

John Simmons
January 1975

Chapter 1

The Issues

Crisis is the term increasingly used in discussing the level reached by the education problems of the developing countries. The educational crisis has many dimensions. Even with immense and sustained efforts, illiteracy is increasing in some countries. Primary school graduates, in some countries still only a tiny minority of their age group, can find jobs no more easily than if they had no schooling. The once-hoped-for jobs are filled by those with some vocational or secondary training. Yet many individuals with vocational training, for which the manpower needs are supposedly greatest, often cannot find the jobs for which they were trained. And the white-collar jobs which were so numerous in the early years after independence as colonials were replaced, now provide openings only through natural attrition. Everywhere parents are learning that education for their children will not bring the economic security for which they had hoped, except to a tiny group.

Additional dimensions of the educational crisis suggest the magnitude of the problem. Governments have responded to the tremendous demand for school places by limiting their investments in the other sectors of the economy which might have created higher levels of economic growth or improved income distribution more effectively than could investment in education. Government attempts to limit the investment in school places are usually abandoned under pressure from parents. Yet politicians have found that the public support they once reaped by supplying schools and teachers throughout the land has often given place to dissatisfaction and even political instability.

Students perceive that a secondary school diploma or university degree is the essential requirement for achieving social mobility and secure employment. They resent having their hopes raised by the promises of education, only to learn that promises have little meaning for obtaining employment. Their parents, who have often made heroic sacrifices to assist their children's education—even in countries where education is supposedly "free"—share their bitterness and frustration. Furthermore, those fortunate few who do get posts then find that, even with increasing amounts of secondary and vocational training, they still cannot get secure employment as those before them were able to do. It is not paradoxical that, as we have found in our survey, when they finally enter the labor force they assign education a low priority for getting a job or advancing in it.

Economic planners are learning that providing facilities and teachers to meet exaggerated forecasts of skilled manpower required for development has wasted resources that could have been made available for other and more productive investments. A significant dimension of the crisis is that achievement scores do not tend to increase when per-student expenditure rises, (Alexander and

Simmons, 1974). How educational quality is improved is now open to serious question. Some educators do not seem concerned about the waste, irrelevance, and disfunction of some educational investment--perhaps because they have convinced themselves that their efforts will have long-range benefits. Also, of course, their jobs would be threatened if educational investments were reduced. Educators often support their belief in the private and social benefits of education by pointing to economic studies showing the high rate of return to investment in education compared to other investments favored by planners, especially infrastructure. The present study, however, will add to the growing evidence that most previous research has grossly overestimated some of the private and social benefits of formal education.

That these educational problems exist there is little doubt, although their nature may vary in each country. Economists are among the strongest critics of educational policies. Yet, something more complex than a disequilibrium in supply and demand--which is the traditional critique made by economists--has caused the problem to reach crisis proportions in many nations (Simmons and Associates, 1973). We will argue in the following chapters that while the disequilibrium effect is important, the crisis is largely due to the growing contradictions of formal education and social needs.

A primary concern of economists is the technology of education: the study of how labor and capital are combined in the form of teachers, buildings, and other inputs to produce changes in the cognitive and non-cognitive characteristics of students. Technology includes the efficiency issue: such questions, for examples as whether it would be possible to lower costs per student and not reduce their test scores; or whether capital could substitute for labor at less total cost for the same output. In other words, could more equipment or better buildings reduce the number of teachers required or the level required for their training? Or is a labor-intensive educational policy a more feasible alternative?

A second concern is the determinants of school outcomes, an integral part of the technology issue. It is essential to understand the many influences that contribute to school achievement, and the relative importance of their contribution. Furthermore, since we are studying the contribution of schooling to development, we are also interested in those determinants of workers' earnings, job promotion, and satisfaction. We group these determinants into four factors--family background, personality traits, school experience, and work experience--as is shown in diagram 1.1.

The contribution of education to development can be viewed as essentially a problem in economic analysis while drawing on the other social sciences. The planner is required to decide between alternative investments, and this decision requires an understanding of the technology of education. It will be argued that while the research understanding of the technology is far from satisfactory, the results of this study add additional data which indicate that we have placed too much faith in the ability of schooling to produce academic achievement and change in outlook desired by most planners and educators.

Finally, economists have traditionally been interested in questions of equity; until recently they have believed that if governments paid the major costs of education, this would assist in providing equal opportunities to the children of both high- and low-income families. A more careful examination, however, has indicated that, through the tax system, low- and middle-income groups tend to subsidize heavily students of upper-income parents by full or partial scholarships at the most expensive level, the university.

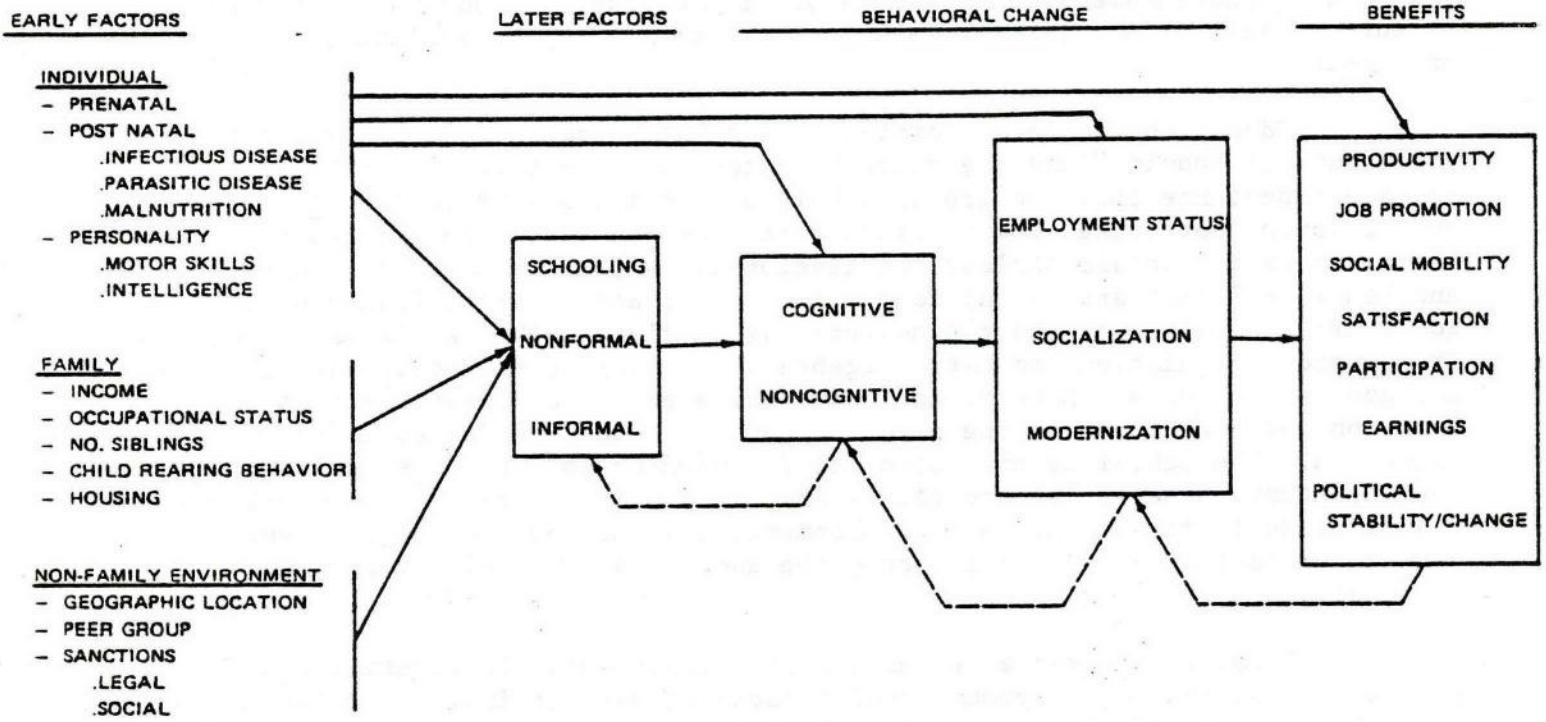
Education should, according to its Latin root, educere, lead the young out; it should "lead the young from the uniqueness of the rich but private experience into the greater whole of mankind's experience." ^{1/} It should lower, not raise, the barriers that separate men. The process of formal education should include the development of skills both attitudinal and behavioral that are useful to the individual and society, although the goals of the individual and the society may conflict. The skills may range from music appreciation and matrix algebra to interpersonal sensitivity and automobile mechanics. Much of an individual's education takes place in the home, on the street, or at the place of work and could be called informal education. The school is not essential in learning any of these skills. In this study, however, we are mainly concerned with the relationship between the individual, the school, and development, and thus we use the narrower concept of education to describe only the socialization that takes place in school.

Finally, we need a definition of development. In general, the process of national development usually includes ways of increasing the gross national product, improving the distribution of income, and promoting social welfare. Our purpose is to translate these measures of national development into their counterparts at the level of the individual and the school. The main indicators we use are academic achievement, earnings, and modernity of individuals. Individual modernity is defined to include those traits that characterize individuals in industrial societies (Inkeles, 1969). Theories of education that we will test suggest that these are partial outcomes of schooling. Increased earnings is the economic objective that is most desired by individuals, particularly lower- and middle-income. Individual cognitive achievement and attitudinal modernity are considered important by many planners for both social and economic development.

The purpose of this study is to clarify two dimensions of the educational crisis: how important is schooling in helping some children learn more than others, and does schooling help some workers earn more than others? Until these questions are better understood by parents, politicians, and planners than they are now, poor nations as well as rich not only risk wasting significant proportions of their resources, but also institutionalizing social injustice.

Diagram 1

THE LEARNING SYSTEM: CAUSES, CONSEQUENCES, AND INTERACTION



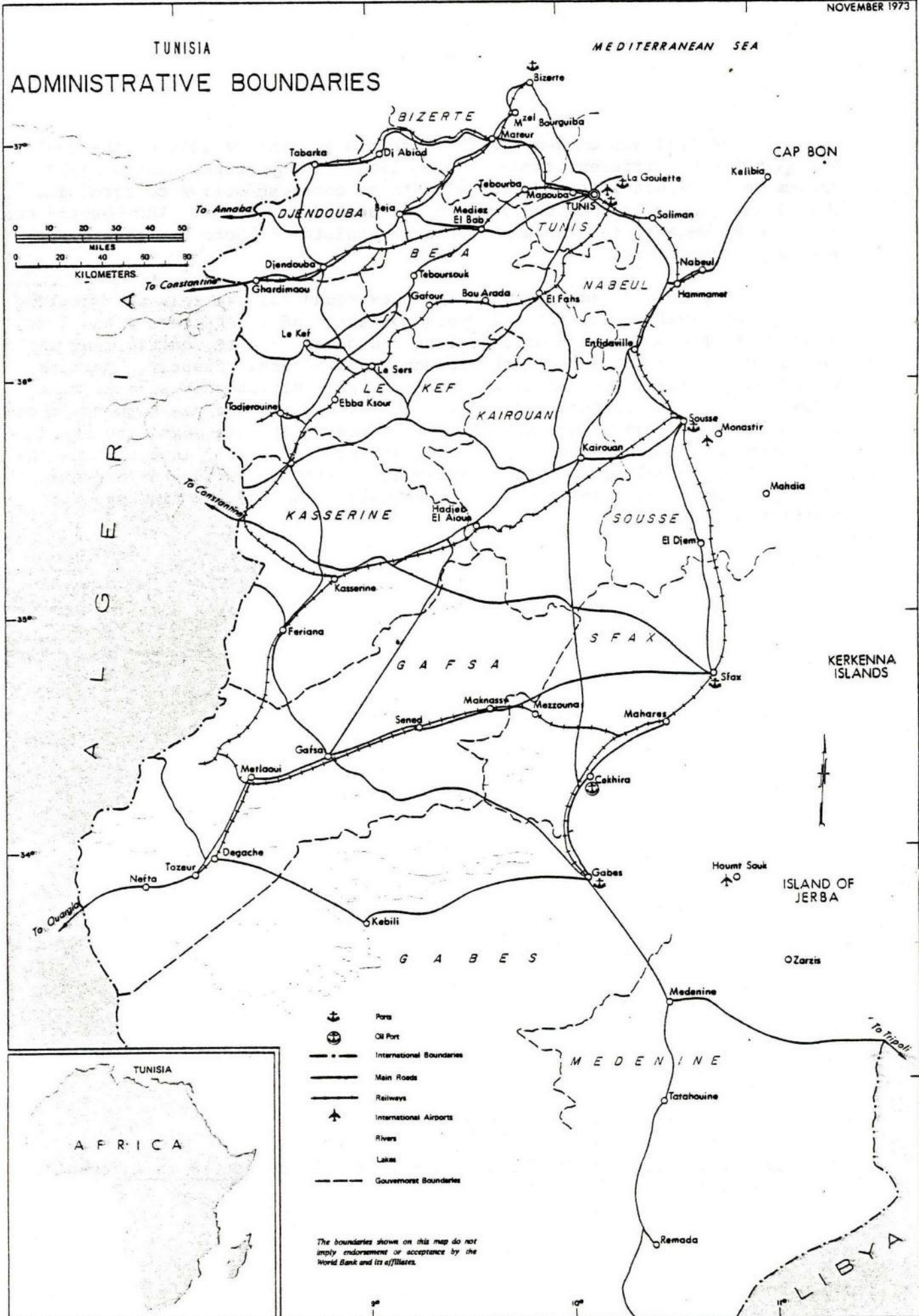
N.B.: Other arrows are omitted to maintain the clarity of the diagram.
 For example, Family and Non-family Environment should have dotted lines to Later Factors and Behavioral Change.

Tunisia was chosen for the research in part because of the quality and quantity of different types of schooling. The post-colonial school system was a result of tremendous efforts to carry schooling to rural and low-income groups at both the primary and secondary levels. The country was also chosen because the research would be assisted by both the government and local researchers.

Chapters 2 and 3 provide the background for the role of schooling in Tunisian development, and the design of the study. Chapters 4 and 5 try to discover the importance of schooling and other factors contributing to cognitive achievement among both students and workers. Chapter 6 examines the often asserted, but virtually untested, proposition that schools make students more modern. Chapter 7 explores a question that has been neglected in the literature on schooling; do individuals retain the cognitive skills that they have learned after they leave school? Chapter 8 investigates the influence of schooling and other variables on earnings. Chapter 9 draws the major conclusions and suggests some implications of the findings for research and policy.

Footnotes

- 1/ John Holt, cited in The School Boys of Barbiana, Letter to a Teacher, p. 165.



Chapter 2

Schooling and Tunisian Development

Long before he became President of Tunisia, Habib Bourguiba emphasized the importance of formal education in building an independent nation. When he took office in 1956, a top priority of development policy was the expansion of the education system. By 1975, after twenty years of effort, he could point to the fact that school enrollments had tripled, and that almost 50 percent of the population between 6 and 21 was in some kind of school. While this expansion required 32 percent of the nation's budget annually, it brought an impressive change in educational opportunity. No single post-independence activity was more appreciated by young and old alike.

Beyond the goal of making good his political promises, Bourguiba repeatedly stated that education would have the objectives of modernizing the way his people thought which he referred to, literally, as "changing their mental structures" and of training them to use the science and technology that was available in the world to develop the country. A major goal of this study is to consider to what extent the efforts of the Tunisian educators are achieving, at the individual level, the twin goals of attitudinal change and learning skills.

But mass education has other goals as well: social, political, and economic. Mass education, it is argued, could permit increased social mobility, opening occupations and responsibilities that had previously been the preserve of the tiny middle- and upper-income groups who could afford private education both in Tunisia and abroad for their children. Increased social mobility might narrow the extremes in income distribution, and promote social equity, thus reducing one cause for political agitation.

Public education was a political necessity at independence as a reaction to the colonial regime, although opportunities for education had not been quite as poor as the reformers like to make out (Montamat, 1969). For the vast number of the population, only two things could give them and their children improved security from the daily fear of inadequate food, clothing, and shelter: education and property. Although property, mainly agricultural land, was concentrated in the hands of the Tunisian and French landlords, redistribution of land was not an important issue (Simmons, 1970; Simmons, 1972). Education, the poor had long assumed, would also bring economic security and social prestige. Independence meant that they were free from their colonial restrictions and able to run their own affairs. Education would give them freedom and skills to seek their own individual goals of security.

When Tunisia became independent in 1956, the educational system reflected, on the one hand, the influence of Islam, which had led to the establishment of a number of schools with a religious orientation centered

upon the az-Zaitouna University (the Zaitounaian Schools) and, on the other hand, the influence of France, which had led to the establishment of a system of schools on the French model, teaching a French curriculum. Among the latter are the Sadiki Schools, founded in 1875, in which courses in the Arabic language and culture were fitted into a basically French educational pattern. Two important achievements can be credited to this system: it preserved the continuity of Arabic culture, and it educated the men and women who are now the country's leaders. The system did not, however, extend literacy to the masses, nor did it produce the skilled manpower upon which rapid economic growth depends. In 1949 only 12 percent of the Moslem children between 5 and 14 years old were in elementary schools, compared with 94 percent among the French population. Of a total Moslem population of 3.2 million, only 6,700 were in secondary schools, and fewer than 1,000 in technical school. In the decade before independence, however, there was appreciable educational expansion (Montamat, 1969).

Education at independence was felt to be essential for national economic development. First, and the essential economic aspect of the role of education, the knowledge gained from education should, according to traditional human capital theory, make individuals more efficient and productive. Their output per hour should increase, and they should use fewer resources in creating this output. Bourguiba also thought that developing modern attitudes and behavior would assist in increasing productivity. Bourguiba and his lieutenants felt that schooling had helped free them from traditional and obsolete attitudes in their drive for independence. Second, French clerks, technicians, and managers, who began to leave even before independence, had to be replaced. We should note that the French colonial objectives differed significantly from those of the British-held colonies, making the transition to independence more difficult. While there was significant variation in the application of the British policy of indirect rule, the effects on the development of domestic manpower can be differentiated from the French. Middle level manpower skills tended to be imported to the French colonies, while with the British there was more training of locals. Local elite were used to rule in British colonies whereas they were not in French. Thus independence caused a shortage of trained and experienced manpower when the French left Tunisia. The major direct benefit from replacing French with Tunisian personnel was to reduce the cost in foreign exchange in which foreigners were paid in an economy which needed to use the foreign exchange to purchase more profitable types of imports.

It was quickly seen that many years of formal education were no substitute for good work experience. Having a diploma of some sort may have been "necessary" to get a job in the Foreign Ministry, or the ex-colonial vineyards, but it did not by itself guarantee adequate performance. Yet little or no time was available to the new managers, technicians, or officials to apprentice properly for their new roles. Not only was there the demand created by the replacement of the colons, moreover; there was also the additional manpower required to plan, initiate, and manage a vast new program for national development. This was a program far beyond the scope of colonial programs. Skills were needed at all levels, and urgently.

In the years of educational expansion, the growing evidence for less than expected returns on educational investments was not lost on Tunisian leaders. While the idea was already implicit in his early speeches, President Bourguiba noted in June 1966 that education conforms to economic principles and "must consequently be integrated in general development plans." Over the next five years he returned to the theme of educational inefficiency and insisted on the "profitability of education." He measured the inefficiency in the school system by the large proportion of children who dropped out of primary and secondary school before finishing, the low level of training of many of the instructors, the theoretical and abstract curriculum, and the emphasis on quantity rather than quality of students. In January 1967, Bourguiba set to work a commission to study education, urging it to consider the criterion of profitability as a major guideline for its study of the system's inefficiencies. Implied in his concern for internal efficiency--the processes that are within the school--was also a concern for external efficiency or social profitability--how the efforts of the school contribute to development goals.

Underlying the emphasis on efficiency is an important assumption: that if we could only do more efficiently what we are already doing, we would both increase the real incomes and psychological well-being of individuals and contribute to the growth of the economy. One might ask, however, to what extent does either reducing the drop-out rate, or increasing the proportion of children who pass national examinations, accomplish these goals? Does the educational system give the individuals the kind of skills needed to improve their welfare and contribute to national development?

At the time that Bourguiba was insisting on the profitability of education, a group of educators and social scientists in the United Kingdom published a national survey of primary and secondary education, popularly referred to as the Plowden Report (Central Advisory Council, 1967). They found that improving the quality of schooling through investments in better facilities, curricula, or teachers had little impact on raising achievement. James Coleman and his colleagues had published a report a year earlier which reached similar conclusions (Coleman et al, 1966). They found that home environment and student personality had a greater influence on cognitive achievement than improved school facilities and teacher training. Finally, a comprehensive review of more than 600 studies in the United States by Christopher Jencks and his colleagues in 1972 confirmed the small impact of schooling on equalizing cognitive achievement, earnings, and social mobility. Alexander and Simmons (1974) found similar results about the determinants of cognitive achievement for developing countries.

Many will argue that these findings would not be true for a developing country, where the conditions are the reverse of those in the U.S. and the U.K. with their high rate of formal education. But, as the results in this study will suggest, they may apply to developing countries as well; the evidence from Tunisia suggests that a student's success in examinations is only moderately related to his amount of schooling, but is largely related

to his personality and non-school experience, and that the contributions both of the amount of schooling and level of cognitive achievement appear to have little relationship to the earnings of young workers.

The real educational crisis is not the lack of resources, but the very nature of formal schooling and its impact on the individual and society. But first we need to review the nature of the Tunisian educational system. After twenty years of a national education policy, it is possible to assess the achievement.

Tunisian Educational System

The Tunisian government has regarded formal education not only as a pre-condition of economic development, but also as a means of changing the way individuals think about themselves and their society. In pursuit of these objectives, the government has sought to establish universal primary education and, through 1971, to expand the number of places at secondary and higher levels as rapidly as resources would permit. After 1971 enrollment began to be restricted at the primary and secondary level. Since independence there has been considerable progress toward these objectives, at least in quantitative terms. Primary school enrollment increased almost threefold--from about 320,000 in 1958 to 934,000 in 1971. Secondary school enrollments rose more than fivefold, from 33,000 in 1958 to 184,000 in 1971. Enrollments at the post-secondary level have also increased fivefold, from 2,000 in 1958 to 11,000 in 1971.

In terms of children in school between 1956 and 1971, primary school enrollment increased from 29 to 73 percent of the 6-14 age group, secondary enrollment from 11 to 42 percent of the 15-19 age group, and university from 0.1 to 3 percent of the 20-24 age group. This expansion imposed a heavy financial burden on a country still at an early stage of development. In 1974 Tunisia allocated to education almost 9 percent of its GNP and over 32 percent of public expenditures.

By the mid 1960s it was evident that the successful expansion of the education system had created a new set of problems associated with its equity, efficiency, and cost. The enormous effort and resources allocated to education have resulted in an explosion in the output of school leavers at all levels, an oversupply of academically educated manpower, and an undersupply of needed skills. Qualitative results have been disappointing; a low rate of students completing a level that they start, reading comprehension low, unit costs high, and the benefits have been unequally distributed among regions, social classes, and income groups. In brief, while the education system absorbs the largest proportion of government funds, the money appears to be increasingly misallocated. Public policies remain focused more on increasing the supply of school places than on reducing the gap between the private and social profitability of education.

The Educational Reform Act of 1958. After independence the Tunisian government addressed itself to the remolding and expansion of the educational structure. The Educational Reform Act of 1958 introduced important changes into the public primary, secondary, and higher schools as are shown in diagram 2.1 on the following page. The act provided that the religious schools should gradually be merged into the state school system. It did not cover the French schools, which were then conducted by the French Cultural and University Mission primarily for the benefit of French children, but increasingly admitting Tunisians. Nor did it cover the vocational training schools operated by the Ministries of Social Affairs, Agriculture, and others. The reform was embodied in the 1959 Ten-Year Plan for Educational Development.

The school system as reorganized on the basis of the 1958 act introduced language and other reforms into what remained basically a French structure: six years of elementary school leading, through a competitive examination, to either three years of intermediate or six years of secondary school. Arabic was introduced as the medium of instruction for the first two years of primary school, then concurrently with French; the latter remains predominant at the secondary level. The French language is considered an "indispensable but associated" vehicle of culture.

The classical academic type of elementary school is found almost everywhere, even in the most remote areas. The function of the primary schools is mainly instruction in the 3 Rs, French, and some civics. A final certificate is in practice given only to those pupils who succeed in passing the secondary school entrance examination. The remainder are considered--and, more regrettably, may be inclined to think of themselves as--dropouts. Although they have completed the course of instruction as shown in diagram 2.2 on the following page, they are outside the Pyramid. Approximately 30 percent of the entering pupils do not complete primary school, and a further 23 percent fail to qualify for secondary; thus, 53 percent of those entering primary school complete their formal education after six grades, taking an average of eight years to pass through six grades. Forty-seven percent go on to the secondary level. The probability, however, that this group can read and understand a national newspaper is low (Simmons, 1973).

Of those who normally qualify for admission to the secondary level, about one-third go to intermediate technical schools, and two-thirds attend academic schools. At the technical school a three- to four-year course combines vocational education with further general education. The intermediate technical schools were called college moyen from 1959-1970, and education professionnelle from 1971. They are intended to provide the basic skills needed in the lower ranks of industry, government, and business. About 75 percent of the entrants complete the technical course, and about half of those who complete do not go into the work force, but go on to some form of further training (Morrison, 1969).

TUNISIAN EDUCATIONAL STRUCTURE

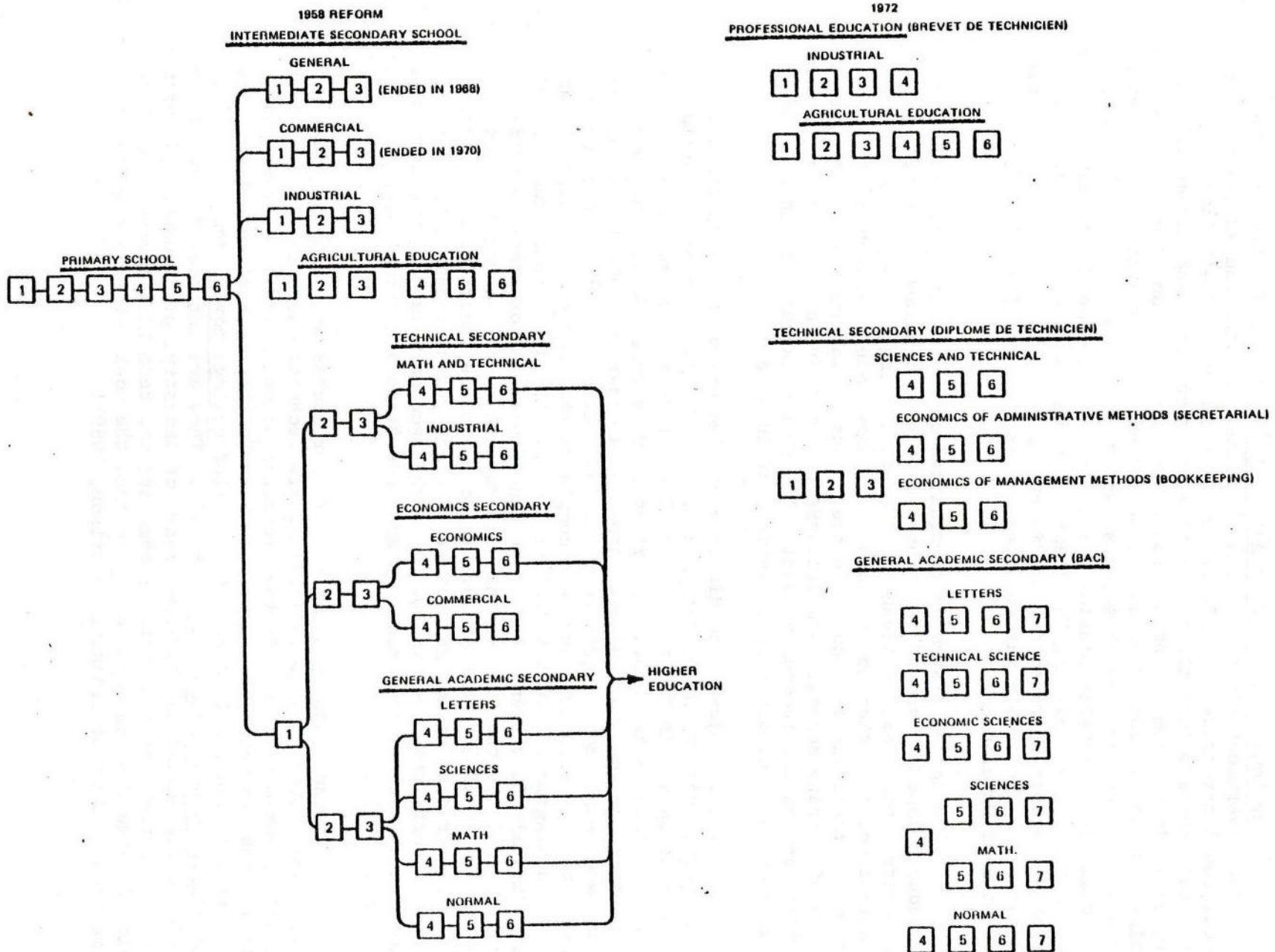


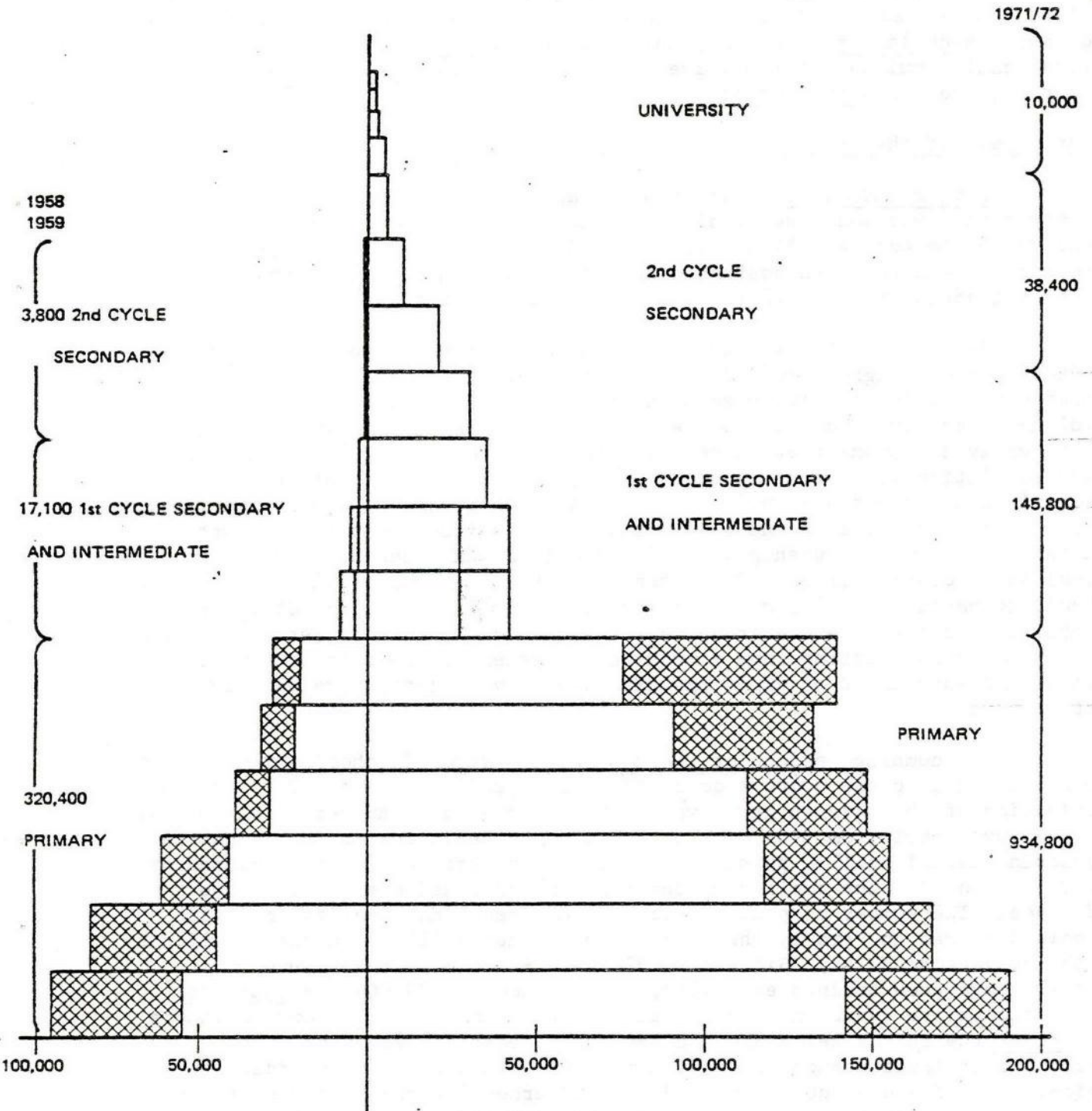
Diagram 2.1



- 2.7 -

Diagram 2.2

TUNISIA

EDUCATIONAL PYRAMID: 1958 and 1972



 PRIMARY SCHOOL PUPILS REPEATING GRADE
 TERMINAL INTERMEDIATE SCHOOLS

Academic secondary is seven years, a seventh year having been added in 1969. Less than 40 percent of those who begin complete seven years and take a baccalaureat (bac) degree. All baccalaureat holders are automatically admitted at the university, although some post-secondary schools do not require the baccalaureat.

An Appraisal of the System

Primary Education. In 1958 it was predicted that universal primary enrollment would be attained for the first grade in 1966/1967, and would reach the entire 6-14 age group by 1972/1973. This target has not been reached and has been postponed indefinitely. In 1966 the enrollment of first graders was only 77 percent of the projected figure.

Resources intended for primary school expansion were transferred to secondary and higher education. A slight decline in the proportion of children aged 6-14 in primary schools since 1969/70 indicates that primary enrollment may have reached a plateau, partly because of a reduced emphasis on the early achievement of universal primary education in some rural areas where population is widely dispersed, and partly because primary education for girls has not yet won full acceptance in some areas. The enrollment rate ranges from 57 percent of the 6-14 age group in Kasserine and 59 percent in Jendouba, both rural townships, to 81 percent in Tunis and 82 percent in Nabeul both coastal cities. In Kasserine only 34 percent of girls are in school, compared with 75 percent in Tunis. In 1971/1972, about 85 percent of the boys in the 6-14 age group were in school, but only 58 percent of the girls. Although starting from a much lower percentage over the ten-year period, the enrollment of girls has expanded only slightly more rapidly than that of boys.

The combined effect of the two-shift system of school attendance, the reduction in class hours from 30 to 25 for grades three to six, and the elimination of the seventh grade was to reduce the total number of class hours for primary school from 210 hours to 130 a month beginning in 1958. Courses developing manual skills, physical education, and art were either omitted or severely reduced. The quality of teaching varied considerably over time and space. The number of primary teachers of French nationality in public schools declined to zero by the late 1960s. (They still constitute a majority in the private schools.) Since the 1958 Reform Act more than 1,000 teachers have been trained each year, so that now the 20,000 instituteurs and moniteurs are Tunisian. Instituteurs have usually the bac and moniteurs the brevet the latter being given after three years of secondary. The percentage of instituteurs and moniteurs varies considerably according to region. In Kef and Jendouba only 29 and 30 percent of the teachers are the better-qualified instituteurs, while in the Sfax and Tunis regions the percentages reach 60 and 63. The national average is 52 percent.

The salaries of primary teachers in 1974 average about 30 dinars per month (62 dollars), about three times the earnings of a fully employed

agricultural laborer. Primary teachers' salaries are about 40 percent of secondary salaries. The capital cost of creating a new job in primary education is about 60 dinars (124 dollars), and could be even less if school construction methods were simplified and more intensive use were made of existing buildings.

One of the most serious problems of primary education is the high repeater rate. The effect of dropouts and repeaters on primary, and even secondary, education is revealed by an analysis of the school careers of one thousand children. Almost 18 percent left school before completing the fourth grade, so that the investment in their schooling must be considered completely wasted. Not more than 54.4 percent reached the last year of primary school without any delay. Those entering secondary school had on the average spent eight years completing the six-year primary curriculum. Including time spent on dropouts and push-outs, a total of 12.8 teaching years was required for each pupil completing primary school. Because only 25 percent of the primary completers entered secondary school, we can estimate that 55.1 teaching years were required for each pupil permitted to enter secondary education.

For some of the above reasons it is not surprising to learn that most students who finish primary school cannot read adequately in either Arabic or French. Furthermore, those were dropped or pushed out before reaching the sixth grade learned even less. A recent study (see p. 2.20) suggested that only 38 percent of the sixth-grade students could read and understand passages from an Arabic newspaper, and only 27 percent from a French. The primary schools do not seem to be doing the job they were expected to be doing.

Secondary Education. Secondary education in Tunisia is a complex operation involving three ministries--Education, Agriculture, and Social Affairs. The educational plans of 1961 and 1965 were the basis for the expansion of secondary education over the period 1961-1972. As the decade progressed there was an important reduction in targets. Total Ministry of Education secondary enrollments in 1971/1972 were 57 percent of the 1961 projection (IBRD, 1973, table 22.3). This was mainly the result of budgetary constraints during the middle 1960s.

Vocational education has expanded rapidly, although the rate of economic growth has produced insufficient jobs. In addition to the 38,000 "technical" students under the Ministry of Education, there were 30,900 students not under the Ministry, i.e., a total of 68,900 receiving technical education in 1971/1972. About one-half of these, or about 34,000, enter the job market each year to compete for barely 10,000 openings. While 40,000 new jobs were created each year in the early 1970s, 75 percent of the new jobs created are for experienced workers, not apprentices just leaving school. Hence unemployment and underemployment among technical school graduates has been rising rapidly.

The paradox of a growing social demand for secondary school places both academic and technical, and a declining economic demand for the services of these graduates, is unlikely to disappear. The jobs held by expatriates until the early 1960s have now been filled by Tunisians, nor can sufficient jobs be generated to reduce unemployment. During the Fourth Plan period (1973-1976) the number of unemployed is expected to increase. While there are no comprehensive estimates of the number of unemployed school leavers, partial studies indicate that their number have increased (IBRD, 1973, table 22.19).

Another issue at the secondary level has been the dependence on foreign teachers, who accounted for 34 percent of the total in 1971/1972, the same proportion as in 1965/1966, the earliest year for which data are available. During the same period the number of secondary and professional teachers virtually doubled, reaching 6,932.

Admission to secondary school is based on an examination in Arabic, French, and arithmetic in primary school. The examination is heavily biased in favor of students who are strong in French. Yet, the 1972 National Commission on Education and Research reports that only a small proportion of students, "thanks to favorable family and social conditions, achieve a sufficient knowledge of one language or the other." Evidence on the level of reading comprehension supports this observation (Simmons, 1973).

The number of students admitted to secondary schools fell from 51,955 in June 1969 to 32,663 in June 1971 (IBRD, 1973, Table 22.4). This represented a decline from 41 percent to 25 percent of the students who completed sixth grade. The government officials wished to reduce the number of secondary school students. While this was a courageous shift in policy because it adversely affected middle- and lower-income students, the shift is probably having an inequitable effect. Since an even higher level in French is now required for admission to secondary school, students from the poorer homes and rural areas find themselves at an even greater disadvantage. There has been only a modest increase in the proportion of women students, from 24 percent of the total secondary enrollment in 1961 to 28 percent in 1972.

In addition to increasing the number of secondary school graduates competing for jobs, the increase in the number of students has led to extreme pressure on school accommodations. Dormitories, planned for single beds, now have double deckers. Laundry rooms, gymnasiums, infirmaries, and even warehouses are used to house students. Schools planned for 800 now have 1,400. Because of these pressures, the curriculum has had to be simplified and the number of class hours reduced.

These circumstances, according to the national commission (Synthese, 1971), have caused feelings of instability and insecurity among teachers, parents, and students. For example, it took the average student eight years to reach the twelfth grade of secondary when it was the last grade. But the vast

majority did not reach the last grade, since they either dropped out or were pushed out. Out of a total of 202,565 students entering the first academic secondary year between 1961-1970, 81 percent have dropped out or are expected to. Over the same period, 92,808 entered technical secondary, of whom 63 percent have dropped out or are expected to (IBRD, 1973, Table 22.6).

Vocational Training. As we have mentioned above, an important part of vocational training is done outside the Ministry of Education.

To fill the jobs of non-Tunisian workers who departed after independence, industrial vocational training centers were organized. In 1966 the Office of Vocational Training and Employment (OFPE) was created in the Ministry of Social Affairs to coordinate and manage training. Three types of training are given: pre-apprenticeship, adult, and retraining/upgrading.

Pre-apprenticeship training is usually for one year and accepts primary school leavers and dropouts. The courses are supposed to provide a basic knowledge of Arabic, French, workshop calculations, technical science, and drawing, and also to develop a range of practical skills (fifteen hours per week). In 1966 there were 60 centers and about 3,000 students, and by 1972 the enrollments were unchanged (IBRD, 1973, Table 22.7).

Adult training aims at achieving a high level of skill in a narrow field in a six-month course. About 7,200 students were being trained in the early 1970s.

Retraining/upgrading courses vary in length from six months to two years, and are mainly for the training of teachers for the vocational centers. The training is for two years, and is carried out at five centers of which the most important is the National Institute of Productivity and Vocational Training at Rades. The number of workers trained in both the adult courses and the retraining/upgrading courses was about the same in 1972 as in 1966 and has averaged about 10,500 a year.

The agricultural sector was severely affected by the withdrawal of expatriate technicians in the 1950s and early 1960s. Before independence, only one Tunisian had graduated from the Faculte d'Agronomie. Agricultural training has usually been the responsibility of the Ministry of Agriculture except for a short period in the late 1960s, when it was transferred to the Ministry of Education. The courses range from the training of specialized workers to preparation for university degrees.

As in most other countries, specialized agricultural instruction is not given at the primary level. Formal agricultural education and training begin at the intermediate level and are the responsibility of the Ministry of Agriculture.

Students who complete a baccalaureate may go on to the Ecole Nationale Superieure de l'Agriculture de Tunis, a division of the university. The courses of four and six years lead to diplomas in agricultural and agronomic engineering, respectively.

Higher Education. Higher education is open to all holders of the secondary school baccalaureat and only 6 percent of these failed to enroll. The degree requirement is often waived; 37 percent of first year higher education students in 1970/1971 did not have the baccalaureat. For some institutions, it is not required; for example, the Faculty of Technology and the Normal School of Assistant Professors do not require the baccalaureat. In 1961/1962, the University of Tunis and other schools of higher education had 2,234 students. By 1971/1972, enrollment had reached 10,849. The supply of higher education places in Tunisia increased sufficiently to reduce the percentage of students studying abroad from 45 percent in 1960 to 30 percent in 1971.

Adult Education and Literacy. To reduce the proportion of illiterates has been one of the government's principal objectives, but a nationally organized and financed program was not undertaken until 1965, at the same time as UNESCO began its campaign to promote functional literacy. Thus, the Tunisian program, supplemented by UNESCO, provided information useful for low-income adults as well as teaching the simple cognitive skills. The number of participants reached a peak of 41,000 in 1968/1969 and by 1971 had declined to 26,000.

The program seemed to have little impact on the cognitive achievement or attitudes of the participants. An evaluation of the better program centers showed that four years' attendance for three hours per week after work was necessary to achieve the proficiency of a sixth-grade primary student in Arabic reading comprehension (Simmons, 1970/1972). Adults with less than four years did worse than fourth-grade students, which meant they could not read and understand a national newspaper. Finally, 34 percent showed a decline in reading ability two years after completing the course, while 48 percent showed a gain. Students with previous education were more retentive than those without. The program was costly; since only 50 percent of each grade was permitted to proceed to the next, the cost per graduate of the four-year course was high at 1,600 dinars or 3,312 dollars.

The 1966 census indicated a literacy rate of 55 percent of the population on the basis of the number of people who had completed four years of primary school. This criterion probably exaggerates the rate; most do not attain functional reading comprehension, defined as newspaper comprehension, until the second year of secondary school, which corresponds to eight grades of school, not four.

Private Education. Private education has performed an important function in Tunisia before and after independence. There are two main kinds of private schools: schools staffed by French teachers and subsidized by the French government, mainly attended by children of the elite; and schools attended by students of the middle- and upper-income groups who drop or are pushed out of the public secondary system. The former concentrate on academic subjects, while the latter provide a mixture of academic and commercial courses. Before independence the schools subsidized by France

mainly served the French community, but ten years after independence the students were virtually all Tunisians. Since the reduction in 1970 in the percentage of primary students admitted to public secondary schools, the number of private students has increased at both primary and secondary levels. New non-elite private schools have opened across the country. The number of students receiving private education was 21,000 in 1972--20 percent more than in 1971. The total number of private students was less than 3 percent of the number enrolled in public schools.

Pre-School Education. Most preschool education is in private institutions, some of which are subsidized by the French government. In the middle 1960s, however, the Ministry of Social Affairs began to organize jardins d'enfants, supported by local contributions, in which four- to six-year-olds engage in supervised play and receive nutritious meals. Low-income students either pay half fees or nothing, according to the local contribution.

Costs. Total government expenditures on education have expanded more rapidly than any other sector. Between 1956 and 1974 educational expenditures increased by more than a factor of 5 in 1966 constant prices. This includes capital and current expenditures for all ministries. Sixteen percent of the education budget was capital expenditures.

In 1971, 31 percent of the total expenditures went to primary, 48 percent to secondary, 5 percent to vocational training at the secondary level and outside the ministry, and 16 percent went to higher education (Tibi, 1972). The educational expenditures have risen from 3 percent of the GDP to almost 9 percent between 1956-1971. The 1971 educational budget was 62.3 million dinars, or 128.96 million dollars, which was 33 percent of the central government budget of 191.3 million. If health expenditures of 16.5 million are added to the education, then 41 percent of the budget was invested in human capital.

Two major studies on educational costs (Bsais and Morrison, 1970; Tibi, 1972) reached the conclusion that real costs per secondary and university student were high and rapidly rising, while primary costs appear too low. The costs per student for the three levels of the educational system are given in table 2.1 below. Secondary education is more than seven times as expensive as primary. Agricultural education costs 17 times as much as primary, and higher education 41 times as much as the education of one primary student. A major component of these high costs is the high salaries of foreign teachers, who constitute 34 percent of the staff at the secondary local and more than 50 percent at higher levels. Annual scholarships averaged 75 dinars or 155 dollars 75 per holder for secondary, and 406 dinars or 840 dollars for higher education.

Table 2.1
Educational Unit Costs in 1971
(Current Prices in Dinars)

	Current	Capital	Total	Index
Primary /a	23 /b	1	24	100
Secondary /c	156	25	181	754
Vocational /d (industrial)	202	6	208	867
Vocational/e (agricultural)	416 /g	-	416	1,733
Higher	762 /f	224	986	4,108

/a Synthese du Plan, p. 59ff.

/b Of which 1.40 was spent on food, clothing, and scholarships.

/c For 1970, and includes academic and professional (Tibi 19 , p. 134ff.)

/d For 15,000 students (Tibi 19 , P. 152).

/e Tibi 19 , P. 148.

/f Of which 406 dinars went for food, tuition, and scholarships.

/g 1969 (Tib 19 , p. 150.

The real cost of producing one graduate consists of the total cost of his education plus a share of the cost of the education of those students who did not graduate. This fails, of course, to take account of the benefits that may have accrued to the students who did not graduate, although these benefits are small for most secondary students who do not reach brevet certificate stage (Carnoy, Thias, and Sack, 1972) and are almost insignificant for many primary students (Simmons, 1972). The costs per graduate at each level of the educational structure, when dropouts and repeaters are included, are shown in table 2.2. Private costs are excluded from these calculations. The cost per primary graduate was D 396 in 1972. The cumulative cost of educating one secondary graduate (i.e., primary plus secondary) was D 4,792 and one university graduate D 19,582.

Table 2.2
Cost per Graduate in 1971
(Current Prices in Dinars)

	Cost/ Student (1)	Mean Years Required to Obtain Certi- ficate (2)	Cost/ Grad- uate (3)	Number of Non- Certi- ficate Students per Certi- ficate holder (4)	Mean Years Schooling Non- Certi- ficate Students (5)	Total Cost of Non- Certi- ficate Students (1)x(4)x(5) (6)	Cost Graduate (3)x(6) (7)
<u>Each Level</u>							
Primary	24	8	192	2.1	4	202	394
Secondary	181	9	1,629	5.2	3	2,769	4,398
Vocational (indus.)	208	4	832	2.7	2	1,123	1,955
Vocational (agric.)	416	7	2,912	3.0	3	3,744	6,656
Higher	986	6	5,916	3.0	3	8,874	14,790
<u>Cumulative</u>							
Primary + Secondary	--	--	1,829	--	--	--	4,792
Primary + Voc. (ag.)	--	--	3,104	--	--	--	7,050
Primary + Sec. + Higher	--	--	7,745	--	--	--	19,582

Source: Based on data from le Ministere de l'Education Nationale.

Input-Output Relationships. Tunisia is one of the few developing countries where an attempt has been made to estimate the input-output relationships of the schooling process. A summary of the evidence for all countries is in Alexander and Simmons (1974). This relationship is essential for understanding why some students perform better than others, and thus which school inputs are most effective. Some studies measured noncognitive achievement as an output, recognizing that education significantly affects aspects of students' behavior in a way not measured by the cognitive achievement measure, and that noncognitive achievement may be more important

for the future productivity of the worker than cognitive achievement. One of the Tunisian studies defines noncognitive achievement as a function of parental socioeconomic status, student's personality, and schooling, each of these independent variables having several components; for example, schooling comprises teacher qualifications, student/teacher ratio, and school supplies.

Cognitive achievement, the basic output measure, is usually broken down into specific skills like reading and arithmetic. For Tunisia the common measures include reading comprehension of Arabic and French, the test being the ability to read materials not specially prepared for school purposes, such as comic books, magazines, and newspapers. Factors such as abilities, parental encouragement, and teacher capacity determine when a student reaches this stage. For most countries it is assumed that the critical point is reached before or during the final grade in primary school.

To measure the extent to which the Tunisian primary system is developing cognitive skills and to complement the input-output studies, a reading and arithmetic test was given to a non-random sample of 442 students from 12 schools across the country, ranging from fourth graders through the second year of secondary school, and including 194 sixth graders (Simmons, 1973a). The test was designed to measure ability to read and understand material of newspaper level difficulty in both Arabic and French.

Each student was given five written questions, two measuring comprehension below the newspaper level and three measuring comprehension at the newspaper level. To pass the test, a student should have answered two of the three newspaper-level questions correctly as well as the two simpler questions. Four percent of the sixth grade students could not answer any of the French questions and 5 percent got all 5 correct. Twenty-seven percent passed the test in French. Four percent could not answer any of the Arabic questions and 11 percent got all 5 correct; 38 percent passed the test in Arabic. Three percent of the sixth graders could not answer any of the arithmetic questions, and 23 percent could answer all three. Given the nature of the three questions, and the potential use of the skill out of school, all three items should have been answered correctly. The testing procedures and results are described elsewhere (Simmons, 1973a). Testing students in the second year of secondary, after eight years of schooling, indicated a high pass rate. The finding for primary which show a low level of reading comprehension, are consistent with the result to be reported in Chapters 4, 5, and 7.

Two studies that estimate the cognitive achievement of students as a function of school inputs, family background, and personality have been completed in the past few years. One study uses a national sample (Carnoy and Thias, forthcoming), while the present study concentrates on low income rural and urban groups. Both studies show that some students score higher in tests of cognitive achievement than others mainly because of family background and personality rather than because of the quality or quantity of school inputs. The present study shows that even an additional year at the primary level has little effect on achievement.

Two other studies measure the noncognitive educational achievement, "modern attitudes" (Erkut, 1973a), and political attitudes (Taylor, 1973). The studies conclude that primary schooling has little effect in developing "modern attitudes" as measured on the Inkeles modernity scale, but secondary schooling has a significant effect. The second study also suggests that the more years of secondary school students have, the more critical they are of the "establishment." These results appear consistent with those of recent educational research in other countries (Simmons, 1974; Alexander and Simmons, 1974).

Several studies have sought to determine the importance of schooling for lifetime earnings. Earnings are regarded as a function of schooling, ability, work experience, and parental socioeconomic status. A national survey in Tunisia (Carnoy, Thias, Sack, 1972) found that the predicted lifetime earnings of a worker with no education at all were just as high as those of a worker with full primary and two grades of post-primary schooling. The more schooling workers had after the second secondary year, the higher their earnings. But the older the workers in this group, the less important schooling below a certain level was in determining their earnings. For example, for schooling to be significant for workers above forty, they had to have had one year of university training. Contrary to expectations, workers aged 21-40 with vocational training were found to earn less than workers who had general education. Furthermore, training on the job was highly significant in determining earnings.

Employment

What kind of jobs do graduates and dropouts find when they leave school and vocational training? This information is often referred to as the "external efficiency" or "effectiveness" of the investment in formal education. The data available are surprisingly limited for a country that has invested such an important part of its budget in formal education. Even the census data of 1966 have not been analyzed for the nature and extent of educated unemployment.

Comprehensive manpower planning has never been undertaken even after more than two decades of international assistance. A number of studies, however, have reviewed the employment of vocational school graduates.

Two available studies were carried out in the 1960s. They show high levels of unemployment and underemployment. Underemployment among vocational school graduates means that they were employed in a job for which they were not trained, with agricultural graduates being less employed than industrial graduates. A 1961 study (Ford Foundation, 1964) found from a sample survey of all graduates that 10 percent were unemployed, and 25 percent went on for further studies. Another study of the employment status of school leavers from a large rural training center in 1964 showed that for 52 percent of the graduates there was no correspondence between their training

and the job they held a year after completing the training, 42 percent said that there was some relation, and 6 percent said that they were working in a job for which they were trained (Zamiti, 1974, p. 23). A study similar to the one in 1964 but limited to the industrial sector was carried out four years later. It found that the output of the vocational education center was four times what the sector could employ (Zamiti, 1971, p. 20). The study revealed that the employers tended to reject the graduates of vocational training centers because they wanted starting salaries that were too high, their turnover rate was higher than workers without training, and the training was too advanced for the jobs that the workers had to do. Finally, few job openings existed for inexperienced workers, while most of the new jobs were for workers with experience. The disequilibrium in the supply and demand for semiskilled and skilled manpower is shown by a study of the employment offices in 1966 and 1967. Seeking work were 48,000, but only 15,000 jobs were listed and 11,000 workers were placed. A survey of these seeking work showed that 66 percent had had vocational education (Chouikha Baffoun, 1971). Faced with this problems of ineffective vocational training, however, the officials of the responsible ministry still claimed important economic benefits of vocational training as a precondition for industrialization, and as a humanitarian response to the unemployed (Zamiti, 1971).

The most recent survey was carried out by the Office of Vocational Training in 1970. It was a carefully chosen sample of 1,506 vocational graduates from the Ministry of Agriculture, the Ministry of Social Affairs, and the Ministry of Education. The tracer study interviewed graduates and leavers in the years 1967, 1968, and 1969. During this period a total of 37,000 students had graduated or dropped out of the vocational training facilities in the three ministries. A sample stratified by type of training institution contained 2,100 leavers of which 1,500 were located. The survey had found that at the time of the interview 20 percent had gone on to another school, 61 percent were employed, and 39 percent were unemployed (Marcissun, 1971, Table 8). They were asked how long it had taken them to find a job after leaving school. It was established that 50 percent found jobs in 3 months or less, 18 percent took 4 to 17 months, and 10 percent took 18 months or more. Subsequently some of the boys became unemployed. For the sample the largest single group of unemployed were the 75 percent from the agricultural centers, while 40 percent, which was about average for the Ministry of Social Affairs centers, were from the college moyen. For those who were employed, 70 percent said there was no relation between their training and their current job.

Serious unemployment among university graduates began in 1971 and has continued to worsen although there are no survey data on the issue.

A second sample study (Simmons, 1972) was confined to blue-collar workers in the shoe industry with education limited to high school and less. Since earnings in the shoe industry tend to be based on piece rates and therefore reflect marginal productivity better than time rates, the findings are of particular interest. They show that, while additional years of primary

schooling were significant in predicting earnings, they explained only one percent of variance in earnings. In contrast, the years of work experience were almost three times as significant as schooling. Attitudinal variables were also found to be significant.

These studies suggest that the importance of additional years of schooling in determining earnings is much less than might be expected. Such factors as work experience, parental socioeconomic status, and personality traits tend to be more important than schooling. Finally, the cost-effectiveness of the present system at all levels is low because of wastage and the declining probability that students will get the jobs for which they are trained. Clearly, if the educational planners had a better idea of what the students were being trained for, they could plan more effectively.

Equity

Equity in the educational sector depends on the distribution of benefits and costs--in particular, on the changes over time in the distribution of the education benefits between different social groups. The basic data are limited, and the intergenerational social mobility data required to answer these questions are incomplete. The partial data suggest, however, that in 1970 upper-income groups were reaping substantially greater benefits from education than lower-income groups, and that sons of low- and middle-income urban parents had little prospect of obtaining jobs of higher status than those of their fathers (Allman, 1972).

In 1970 the Ministry of Education classified students at the three levels of education according to their fathers' occupation. We find that there are 8.8 times as many students with fathers of high socioeconomic status (SES) getting some higher education than would be expected from the proportion of high SES students in the population. The lowest-income group has only 27 percent of the places at the university level that would be expected if education were equitably distributed. Since data on the distribution of social and socioeconomic status for the school age group are lacking, it is assumed that the distribution of status for the primary group corresponds to the distribution for the 6-22 age group as a whole. In fact, this is probably an upward biased estimate since 23 percent of the 6-14 age group never get to primary school, and this group is disproportionately drawn from the lowest-income groups of the population. Thus the gap in access to education between rich and poor would be even greater than the figures indicate. The data in table 2.3 show that in 1970 children in the highest-income group were getting a far greater share of higher education than children in the lower-income groups. A child born into the highest SES group had a 32.6 times greater chance of reaching higher education than a child born in the lower SES group.

Table 2.3

Socioeconomic Status of Students' Fathers
(1970)

(Percentage)

Socioeconomic Status	Primary (1)	Secondary (2)	Higher (3)	Ratio (3)/(1)	Chance of Access to Higher
High 1	1.2	5.9	10.5	8.8	32.6
2	26.5	40.0	26.2	1.0	3.1
3	12.7	10.8	17.6	1.4	5.2
Low 4	43.5	17.3	11.9	0.27	1.0
Other	<u>16.1</u>	<u>16.0</u>	<u>33.0</u>		
Total	100.0	100.0	100.0		
Number of Students in Survey (000)	113.9	7.8	0.6		

Source: Ministère de l'Éducation Nationale, Bureau de Planification.

Status: High 1: Highest white collar, professions, heads of firms, and employees in category A of the civil service.

High 2: Employees categories B and C, businessmen, and skilled workers.

High 3: Foremen, semiskilled, or unskilled industrial workers.

Low 4: Agricultural laborer and nonindustrial unskilled workers.

Other: Retired, without occupation, and father dead.

The data from a second study permit a partial answer to the question, Are sons finding better jobs than their fathers because the sons have higher levels of education? The study (Kinsey, 1973; Allman, 1972) was carried out in 1965 and 1969 in three low- and middle-income communities in northern Tunisia, and covered both rural and urban residents. Kinsey and Allman found that, while the level of education of the sons was significantly higher than that of their fathers, the sons under twenty years old held jobs of lower status than their fathers. For sons who were between 20 and 22, the status was about the same. The sons had a range of 1-9 grades of schooling. But their chances of moving up were very limited, because it would have meant moving into grey- and white-collar jobs for which, given employers' hiring practices, they had insufficient schooling. These results show a lack of intergenerational occupational mobility, even when the sons have had more education than their fathers. Unemployment has risen since then, and affects the youngest groups most severely. The results indicate the danger of any generalization about the causal relation between education and upward mobility, and reflect the need for a more intensive study of these questions.

In summary, the data show that in 1970 the proportion of children of upper-income parents receiving some higher education was much higher than the proportion of lower-income children. The rapid expansion of private education since 1970 means that even more middle- and upper-income students will be admitted to higher education than at present. Finally, the partial data on the intergenerational social mobility of low- and middle-income sons suggest that there is little mobility among the youngest school leavers. The other studies suggest that the children of high-income parents tend to get more years of secondary and higher education than low-income children, and tend to find high-paying jobs. Thus, family background and behavior--when combined with school mechanisms that discriminate against the poor, such as foreign language requirements, exams, and teachers' attitudes--are prime reasons for increasing inequality. There are exceptions to this tendency, of course, low-income students sometimes get well-paid jobs without much schooling or get considerable schooling and high-income jobs. But the evidence suggests that the method of admitting students to secondary and higher education, the expansion of private schooling, and employers' hiring practices, far from improving opportunities for increased earnings and social mobility for low-income groups, are, in fact, reducing them.

Education and the Fourth Plan

The major theme of the Fourth Plan (1973-1976) and related documents is to the search for ways to bring the output of the education system more in line with the needs of the economy and the society. ^{1/} During 1973 and 1974 Tunisian educators and planners took an important step toward educational changes that could bring major benefits to the country.

The plan documents: (1) acknowledge the increasingly serious distortions that investment in education is causing in the allocation of resources, (2) show the magnitude of the solutions required to deal with these problems, and (3) suggest creative solutions to deal with some of the problems. These documents illustrate the careful analyses and frank discussions which have taken place. We will first describe the nature of the educational plans, and then discuss them.

Most objectives of the Fourth Plan are consistent with the 1959 plan. The major deviations from 1959 are that universal education has been postponed indefinitely, and that the proportion of the primary school graduates who will be accepted into secondary will fall from 40 to 25 percent.

The major features of the preliminary Fourth Plan include as quantitative guidelines:

1. Increase in primary enrollments at 3.3 percent per annum, a decline from the 8.5 percent average of the 1960s (see table 2.4 below);
2. Increase in the secondary enrollments at 4 percent per annum, a decline from the 17 percent for the 1960s;

3. Increase in the higher education enrollments of 22 percent--an increase from the 16 percent increase in the 1960s;
4. Increased emphasis on science and math at the secondary level calls for a 41 percent increase for the plan period in teachers over the available stock;
5. Increased enrollments in higher education call for 113 percent more professors during the plan period than now exist;
6. Capital expenditures increase under the plan at the rate of 88 percent per year over the base year of 1970/71;
7. Current expenditures increase under the plan at the rate of 20 percent per year compared to the base year of 1970/71;
8. Economic demand for the school output is estimated at 31,200 per year during the plan period, and the supply averages 153,100 per year (see table 2.5 below).

Table 2.4

Projected Student Enrollments
(000 Students)

	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>Percent Growth 1972-1976</u>
Total Primary	888	918	950	975	991	13.2
Total Secondary	172	182	191	199	200	16.4
of which Professional	18	27	34	41	41	124.4
Total Higher	11	11	14	17	21	101.6
All	1,047				1,180	14.6

Source: "Note de Synthese du Plan."

During the four-year period it is estimated that of the 612,400 students educated above the primary levels, over 488,000 are likely to find themselves unemployed for a year or more after leaving school. Table 2.5 categorizes the supply and demand for the average year during the plan period.

Table 2.5

Projected Manpower Demand and Supply (1973-1976)

(Workers/Annum)

<u>Categories</u>	<u>Demand /a</u>	<u>Supply /b</u>	<u>Excess (Percent)</u>
A. Officials and Higher Technicians (Some Higher Education)	1,800	2,300	28
B. Middle-Level Officials	4,300	8,400	96
C. Qualified Workers and Foremen	10,700	38,300 /b	258
D. Semi-Qualified Workers	<u>14,400</u>	<u>94,100</u>	<u>554</u>
	31,200	143,100	394

Source: "Note de Synthese du Plan," pp. 16-17, and notes below.

- Notes:
- a. Demand excludes private employment in agriculture; (net emigration could add about 10,000 workers/year to domestic demand under optimistic assumptions). Demand includes both experienced workers and school leavers. Estimates were made without benefit of comprehensive manpower planning.
 - b. Supply includes 17,500 students/year from the Ministry of Social Affairs programs, and 6,200 from the Ministry of Agriculture.

At the same time, some shortages may occur for trained, but inexperienced, workers. For example, it seems that a sufficient number of primary teachers can be trained to cope with the increase in school population at the primary level. At the secondary level about 2,030 new teachers will be required. While it is projected that this number could be produced, they would not have the needed specialization. Given present trends, by 1976 the secondary level will have 800 more Arabic and history teachers than it needs, whereas it will be lacking 1,000 math, science and French teachers by that date. (See appendix tables 2.1 and 2.2.) In 1972, 40 percent of the secondary teachers, and 57 percent of the university faculty were mpm-Tunisians, mainly French. While the proportion of foreigners may drop in secondary by 1976, it may increase at the university level.

The capital budget for education is more than 43.4 million dinars-- or 14 percent of the total capital expenditure foreseen in the plan (the Fourth Plan, P. 101). Of this sum \$40.0 million is to be devoted to schools and institutions sponsored by the Department of Education; this is an 88 percent increase compared to 1971/72 levels. In the meantime, annual current expenditure is expected to increase by 20 percent over the four years compared to 1971/72. The current budget of the Department of Education will rise to a total of \$255.2 million dinar under the plan (the Fourth Plan, p207). To this must be added for the plan period the total expenditures of \$15 million for agricultural education and \$4 million for vocational training (see appendix tables 2.3 and 2.4).

A disquieting aspect of educational finance is that current expenses tend to grow faster than total public expenditures. The proportion of the national current budget devoted to institutions sponsored by the Ministry of Education increased from 19 percent (1960) to 23 percent (1962) to 26 percent (1965) to 33 percent (1968) to 34 percent (1974). Development of the educational system now has reached a point where education expenses can be stabilized. While primary education is not yet universal, transfers to primary could be made from secondary and higher education budgets and achieve a positive rather than negative economic effect.

Because of the difficulty of meeting the social demand for school places, particularly at the secondary level, the Ministry in the last two years is experimenting with a new policy with significant financial implications. Communities wishing to build secondary schools with their own resources will have the operating costs met by the Ministry budget. Several small towns and villages have already responded. This policy was in response to requests from communities without secondary schools. Estimates were not available on the impact of this policy on either the future growth of the number of students or future operating costs.

The plan also suggest four qualitative guidelines. They are:

1. Undertake as soon as possible studies in the following areas: manpower, reviews of past pedagogical experience, and the educational needs of society;
2. Use the studies mentioned above to plan a major reform of the education system by the end of the Fourth Plan;
3. Improve the information about the labor market that students receive;
4. Consolidate the Ministry of Education's "Educational Professionnelle" (OFPE) and manage it with representatives of both the private and public sector.

The Tunisia planners have analyzed the quantitative and qualitative guidelines in the "Note de Synthese du Plan" prepared by the Ministry of Education. The "Note" concludes that two basic factors constrain the probability of achieving these targets: the inability to train sufficient numbers of teachers, and the lack of construction capacity to build the buildings. Thus the planners see the targets as unrealistic because there are insufficient school places, teachers in the sciences and math, funds, and jobs for the school leavers. While keeping the basic objectives, the ministry planners urge that it is realistic to opt for an educational system that is a "function of our means" and based on a deeper understanding of the mid-term and long-term needs than is now available.

Among their interim solutions, the Ministry Planners propose that the shortage of science graduates could be partially met by reorienting secondary students that are now in non-science stream and by using engineers and other scientists to teach on a part-time basis. For higher education they suggest that the number of students should be limited to the present capacity and that the proportion of students in the different streams should be adjusted to reflect better the needs of the society. A competitive exam should supplement the bac for university admissions. The only way to meet the quantitative targets is the less attractive option of sending students abroad. The construction capacity to build the buildings in the time available does not exist. In sum, the planners suggest retaining the qualitative goals of the Fourth Plan and reducing the quantitative ones.

The Fourth Plan documents do not propose a final investment plan; rather, they reveal aspects of the debate on educational reform that is currently taking place. Our analysis of the Plan will thus be tentative, but several observations can be made. First, the plan does not describe an investment strategy defining what the development objectives are and how education will assist in obtaining them. The reduction in secondary expansion is a step in the right direction, but, given what appear to be the weak conditions of manpower demand, it does not go far enough. The same is true of the reduction in vocational education. In technical training the planners should consider consolidating secondary "technical" as well as "professional" with the OFPE programs using the same rationale used for that innovative move. For higher education the suggested reductions in the proportion of students in the arts and letters are important. There appears little economic justification, however, for the expansion of higher education beyond the present level of 11,000 students.

Second a significant improvement in internal efficiency (both unit costs and dropouts) should precede any expansion, and thus assist in providing the necessary manpower. Third, if the present program were carried out, it would have a serious regressive impact on the distribution of income. Low-income groups would be increasingly excluded from the upper levels of secondary and higher education, unless examination and promotion procedures are changed.

Finally, the present plan would further distort the allocation of resources among the sectors of the economy at a time when unemployment of secondary and university graduates is rising. In view of these reservations, a key suggestion of the plan--namely, to carry out a careful review of the present studies and commission a manpower study, with a view toward preparing a major reform by the end of the plan period--makes good sense.

Conclusion

Since before independence in 1956 the system of mass education in Tunisia has been rapidly expanding. By 1974 virtually all urban primary-aged children had had some primary school, and so had the majority of rural children. Secondary and higher enrollments as a percentage of the age group expanded even faster, with secondary enrollments going from 11 to 42 percent of the age group and higher enrollments from 0.1 to 3.0 percent.

But by the late 1960s this expansion brought on its own problems: increasing levels of educated unemployed, especially secondary students with technical training, and, in the last several years, of unemployed university graduates. President Bourguiba began to insist that education be measured against the criterion of profitability. While the social demand for more school places continued to grow, some government officials felt that the national budget could spend no more than its current 32 percent. In an important step in 1971, admission to secondary was cut by 50 percent of those who had entered the previous year. In the following year primary school enrollments began to decline as parents saw less hope of their children entering secondary school. Thus in the past two years the Tunisian education system has passed a watershed. Since no comprehensive strategy has yet been proposed to deal with the underlying causes of the educational problems, the future is unclear. The documents prepared for the Fourth Plan's education chapter make important recommendations for educational investment; the information provided in the following chapters will, hopefully, assist in clarifying these decisions.

Footnote

- 1/ Three basic documents are relevant to this section: Commission Nationale Sectorielle de l'Education et de la Recherche Scientifique, "Rapport de synthese sur l'education pour la decennie 1961-72," juillet 1972; Ministere de l'education nationale, "Note de Synthese du Plan Quadriennal 1973-76: Les objectives quantitatives and qualitatives du system scolaire et universitaire," mai 1973; and Republique Tunisienne, "IV Plan de development economique et social 1973-76," provisoire, mai 1973.

The "IV Plan..." contains no detailed expenditure figures and no list of projects. Thus, the "Note de Synthese du Plan" is the relevant reference on these questions.

Chapter 3

The Approach: Methods and Subjects

The desirability of using the resources of various branches of the social sciences to define the problems confronting the developing countries and suggest solutions is often stressed. It is, however, rare to find studies that have in fact utilized such multidisciplinary collaboration.

Initial thoughts for this study were to examine education from an economic standpoint--that is, the private and social rate of return to investment in primary and secondary education. A review of this literature, however, indicated that the exclusion of important factors like the years of work experience and motivation, which did not appear in the traditional rate of return formulation, would lead to a misleading estimate. While these factors might be referred to as psychological traits, they would also be economic if they are shown to be determinate in the estimates of workers' earnings. Thus an approach that includes these factors could be a significant step toward a better understanding of educational processes and effects in a developing country.

The basic approach of the study is to explore the determinants of school achievement and earnings among students and workers. The determinants include four major factors that have been mainly studied in developing countries (Simmons, 1974), each with a number of dimensions, namely, the personality of the student and worker, the home background of the subjects, the school experience, and the work experience. Diagram 1.1, earlier, shows the causes and consequences of the learning process. While we were not able to measure all the the dimensions, it is useful to see the comprehensive system.

Measurement

The study required collecting data on students' reading and arithmetic achievement levels, the job characteristics and earnings of workers, and the characteristics of the students and their families. The findings of the previous studies suggest that differences between schools, such as the class size or length of teacher training, have surprisingly little effect on student achievement (Jencks, 1972; Thorndike, 1973). Thus, although learning and schooling processes may differ between the Anglo-Saxon and Arab cultures, we felt some justification in omitting a detailed study of inputs like class size or curriculum. This design decision did not mean that the impact of schooling on achievement was omitted from consideration--since some individuals in the sample would have more schooling than others. What it did mean was that we could reduce the size of the sample and concentrate on individuals in a rural and an urban community.

The instruments were based in part on questions that had been used in previous research including work in Tunisia. An important innovation in the instruments was the use of dialectical rather than literary Arabic in the questions. Previous researchers usually wrote the questions in the French language, or else wrote them in literary Arabic which interviewers then transformed into a shorter form of dialectical when speaking to most people.

Several of the interviews and assistants who had supervised the data collection, coded the interview data. Processing and analysis was then done in Cambridge, Massachusetts with the continuing aid of members of the field team.

Achievement Measures. Scholastic achievement was measured by thirty-minute multiple-choice tests in Arabic, French, and arithmetic. The language comprehension tests involved passages of increasing difficulty, reaching the level of extracts from the national newspapers. The math included addition, subtraction, multiplication, decimal, point and word problems. They were designed to test students in the last two years of primary and the first years of secondary since the majority of the samples had this range of schooling. (See appendix A for the tests.)

The test questions are general and were not designed to test, for example, historical knowledge learned in school. ^{1/} Rather, the objectives was to see if the student could read and understand different passages in order to test their ability in reading comprehension, not their memory. Finally, it should be emphasized that the achievement scores are measures of gross, not net, learning, since they include differential preschool inputs. Ideally we should have tested the level of learning of the students at the time they entered school.

The average levels of schooling of the sample included six grades of primary and two grades of secondary for both urban and rural samples. Scores on Arabic and French reading comprehension ranged from 0-6, and on math 0-5. Scores of 5 and 6 indicated an ability to read and understand the national newspapers, while scores of 2 or less indicated virtual illiteracy with 3-4 showing some literacy.

The data in table 3.1 indicate that 53 percent of the rural sample and 62 percent of the urban could read and understand Arabic to the newspaper level. The remainder were considered semi-literate or illiterate. In French 38 percent of the rural sample had newspaper level reading while 68 percent did for the urban. There were 80 respondents in the rural sample, 176 in the urban, and they include both students and school learners.

Diagram 4.1

Factors contributing to learning and behavior

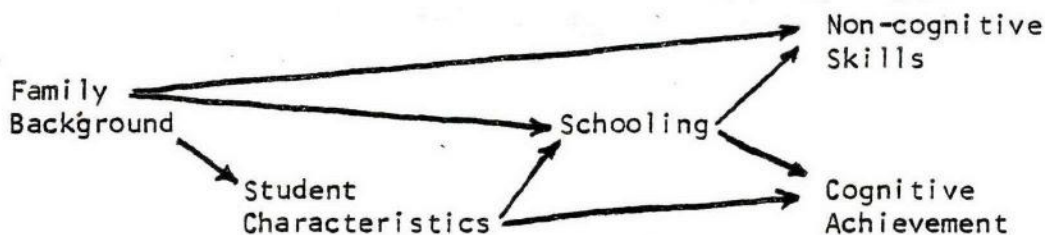


Table 3.1

Distribution of Cognitive Achievement Scores
(Percentage)

<u>Ability Level</u>	<u>Arabic</u>		<u>French</u>	
	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>
Reading and understanding newspapers	53	62	38	68
Semiliterate	39	24	50	29
Illiterate	9	14	11	3

	<u>Arithmetic</u>	
	<u>Rural</u>	<u>Urban</u>
High	55	68
Medium	22	24
Low	22	8

Source: Annex table 3.1.

When we correlated the results of the French and Arabic tests, we found a coefficient of .55 for the rural sample and .26 for the urban. Both were lower than what we expected, indicating that skill in reading one language does not guarantee skill in the other language.

While French is not spoken in many homes in either Tadjerouine or La Goulette, the village and the urban suburb investigated in this Chapter, nevertheless, we assume that most parents perceive a knowledge of French as being essential for a white-collar job. Furthermore, French is used on radio, TV, and in the movie houses. Thus French may not only be familiar but also an important motivation exists for acquiring it. Finally, the students may have difficulties in learning Arabic. The modern standard Arabic which is taught in the classroom is very different from the simpler form, the dialectical Arabic which is spoken in the street. Thus, learning modern standard Arabic may be compared to a patois English speaker learning to read the King James version of the Bible.

Measures of Schooling. The sample had had a number of experiences with different types of schooling. Kuttab, where Islam is taught, is now

mainly for pre-primary students, although before the expansion of primary places it was considered by parents to be something of a substitute. Primary is for six grades, but the stay in primary is usually longer than six years because of boys' repeating grades. We also asked the boys if they had changed primary schools. This could have occurred for a number of reasons including migration, mobility within the community, and displeasure with the previous school, any of which might give a clue to the students' performance. Admission to secondary was by national examinations. While at the time of the study secondary includes grades 6-12, grade 13 has been added since then. Technical school means either a four-year agricultural training college or a three-year industrial training college, both of which require primary. Admission to the technical center also requires primary, in principle; but in contrast to the technical schools, which give mainly blackboard training, the centers try to promote "learning by looking and doing." (See appendix A for a description of the school measures.)

Measures of Family Background. The basic measure is socioeconomic status (SES), which is an index of the unweighted standardized dimensions of house type, number of rooms, father's education, father's occupation, and family income/month. Other individual background measures included mother's education, father's reading habits, mass media use, religiosity, supervision of son's education, and urban exposure. These data were obtained through interviews with the fathers or heads of household. (See appendix A for a description of these measures.)

Measures of Student's Personality. While a great range of noncognitive measures were theoretically interesting, we were constrained from using them because they had not been standardized for Arab or Tunisian culture. We did, however, use two cross-cultural measures--the Overall Modernity Scale of Alex Inkeles and the Need Achievement concept of David McClelland--because of their theoretical relevance and extensive cross-cultural application. (See appendix A for a description of these measures.) The modernity scale was used mainly as a measure of school output, rather than as input; this decision is based both on the findings of Inkeles with the effect of factory experience on workers and his hypothesis that the same thing should happen in schools.

The emphasis of the personality measures was on dimensions that could be interpreted less ambiguously. We asked about the problems students encountered at school; their opinion of school discipline, why some failed, and how they might improve school. We also asked who had been the adults who had a strong influence on them. Other measures tried to capture their religiosity, attitude toward women, use of mass media, and leisure-time activities. (See appendix A for a full description of these variables.)

Choice of Students and Workers

Because of a desire to use the theory and methods of more than one discipline to study the role of schooling in development, this is a pilot

rather than a national survey. For that reason we decided to take a modest approach to the size of the samples. This decision was based on two criteria. First, we had a limited amount of money. Second, because of the pilot nature of the study, we realized that the short-run benefits would be for understanding certain processes and suggesting better hypotheses for future research. At the least any policy implications would have to be confirmed for their consistency with results from research elsewhere or done in the future. To maximize the benefits of the study for use in both policy and research decisions, the nature of the research design was intensive rather than extensive.

Low-income groups in developing countries can be divided into those who live in urban and those in rural locations; the same division by location can be made for middle-income groups. There are marked social differences within each group according to its location. While there is travel between the locations, which we will show is an important factor in predicting students' achievement, most low-income families have their permanent roots in one milieu.

To control for some of the variance that might arise from differences between communities due to social or economic structure--tribal values, for example, or presence of a different employment mix--we decided to limit the sample to two communities, one urban and one rural. Therefore, we sampled a low-and and middle-income suburb of Tunis, La Goulette, and a village on the western plateau, Tadjerouine. These communities, rather than others that could have filled the sampling criteria, were chosen because they had previously been studied for some of the same reasons by David Kinsey in an earlier Harvard project study (Kinsey, forthcoming). The availability of his sample lists, his experience, and early findings were a significant aid in establishing this study.

Several other criteria important to the method of the study required a small sample. First, we wanted to collect data that were as reliable as possible. This required a limited number of interviewers who could be well trained and closely supervised. Second, we wanted to minimize the cost; we had a small budget, and we also wanted to demonstrate what could be done for future research planning, on limited funds. Third, we wanted to control for as many factors as possible that we could not adequately measure--for example, cultural or occupational differences. These criteria also pointed to a two-community study, one urban and one rural. To obtain as large a sample as possible from the rural community, we chose a large village with about 3,000 people.

The sampling was done by house type to assure that a significant number of the different income groups living in the communities were interviewed. The fathers were then given a separate interview to determine their socioeconomic status and attitudes towards education. In the several cases where fathers were not available, the "head of the household" was substituted, usually the mother. The interviewing of the boys was done out of the house, and alone if possible. Fathers were usually interviewed at home.

Most of the interviews, which averaged about 90 minutes, were carried out by third- or fourth-year sociology students from the University of Tunis. Several of them had had experience on previous projects supervised by Harvard faculty. The number of interviewers was kept to a minimum to avoid error; three were used in the rural area and nine in the urban.

While the emphasis was on an intensive exploratory study, data was collected from four groups of the population. The first two were students who were still in primary and secondary school, one group from an urban area and the other from a village. The second two groups were young men from the same urban and rural communities, who were out of school, many of them working. The communities were chosen to be as representative as possible of the socioeconomic and schooling characteristics of low- and middle-income communities in Tunisia, which are not unlike the characteristics found in many developing countries.

To test hypotheses about factors contributing to an individual's high achievement, his retention of achievement, and high earnings, we sampled boys and young men between the ages of 13 and 25. To examine retention we wanted some boys who had been out of school an average of 3-5 years. To understand the possible causal factors in some boys' getting higher earnings than others we needed boys who had begun to work. Finally, to examine achievement we wanted boys who were still in school. Twenty-five years was the cutoff point for the age of the sample because the percentage of older men in the rural community with more than a few years of education is very small. We were unable to interview young men who had emigrated. We estimated that there are about 300 boys in this age range in the village. For the urban community, there were about 3,000 boys in this age range.

A finding of Western research indicates that home background is usually the single most important factor in predicting the level of success in reading achievement of children. For a complete analysis of the impact of socioeconomic status on achievement, it would be necessary to sample students from lower-, middle-, and upper-income strata. Several reasons led us to exclude the upper groups. First, the vast majority of primary and secondary students in the developing countries comes from the lower- and middle-income groups, and thus absorbs the greatest share of the education budgets. A second reason was our concern that the home environment and experience of the upper-class children would have been so different as to require revised instruments. At home, for example, French is the usual language, and extensive exposure to European customs and technology through travel or friends is common. We would suspect that an analysis of upper-class students would give results somewhere between the extremes of upper-class Western students and lower-class non-Western students. To concentrate our attention on the largest proportion of students, we therefore excluded the upper-income group.

Two final points are important about the sample. First, Tunisian primary schools have qualified teachers, teacher supervision, and school furniture, in contrast to the poorer developing countries where these inputs are virtually nonexistent. On the other hand, other developing countries with higher quality inputs have eliminated double sessions at the primary level and offer most students adequate school supplies including books, paper, and pencils. Thus the quality of the school inputs in Tunisia is about average for developing countries. But as we have suggested earlier the quality of most school inputs has not had a significant effect on student achievement in other countries. And this was one of the reasons for omitting their detailed measurement from the study. These inputs would be subsumed in our measure "amount of schooling."

Second, we had hoped to use a nationwide sample of students. But our investigation of the national examination results discovered significant irregularities in both giving and grading the national exams, which indicated they would not be adequate measures of student achievement. We, therefore, decided that we should design and give our own examination.

A Large Village

The historical and contemporary conditions of Tadjerouine may have influenced the results of our study in ways we have not carefully examined in the survey. The fact that French colon families actually lived in and near the village from the early 1890s may have had an important impact on some students' motivation for learning French. But so they did elsewhere in rural Tunisia. This section will begin by discussing some of the historical circumstances of the community and then close with a review of contemporary characteristics of the school and family.

Tadjerouine's history as a permanent settlement dating from, surprisingly, the end of the nineteenth century may seem recent, but in this it is typical of many of the villages in the Tunisian interior. Prior to 1890, the surrounding plains and mountains were grazing areas used by the local tribes, while the springs watered small gardens. About that date traveling merchants began to hold a regular weekly market in the area.

The school was no doubt established initially in the interests of the existing colon families, and to attract more French settlers, rather than primarily for the children of tribesmen. The present primary school building was opened in 1910 (although classes had begun earlier); French married couples were in charge. Other social improvements made between 1901 and 1915 included a dispensary with calls by a doctor who lived in nearby Djirissa, and a post office.

As the population increased in size, the social and occupational structure changed. These changes could not be documented in any sophisticated manner, but certain patterns emerge. By 1940 the strength of the clans had

definitely declined as families moved into the village from the surrounding area; slowly these people began to replace full-time herding with work as agriculture laborers. By 1950 the population had reached about 2,000, making Tadjerouine a large village by Arab standards. More and more young men began to set up their own nuclear family residences after marriage.

Among other changes that certainly had an influence on the boys in our survey who began to go to school in the early 1950s, two major ones are repeatedly mentioned by villagers. These were arrival of the first radio in 1948, and the active resistance to the French colonials beginning in 1950. The invasions of the Second World War went to the North through Souk el Arba and to the south through Kasserine, bypassing Tadjerouine. The impact of the radio on people's attitudes and their awareness of a world beyond a day's work is very significant since most of the inhabitants had never been to Kef, the closest town, and only a few had ever been to Tunis. Suddenly a whole new world came cascading in on their sometimes unbelieving ears.

An important reason for the expansion of the village population was the provision of social services, particularly the schools. Given the tremendous attraction that education has for most parents, it is not surprising that the schoolhouse has attracted families to move from isolated homesteads into the village itself. Small children could not walk more than several miles and still arrive home before dark in the winter.

The years following independence brought a burst of social investment that paved the road through the middle of the village and added classrooms to the existing primary school, and renovated the village center with two sections of housing, a public square, a new market building, and municipality offices. Across the nation this construction activity was matched by an expansion of social organizations ranging from sports clubs to the local cells of the Destour political party. By 1968 in Tadjerouine the youth had nine organizations of their own, and their influence is noted in our survey. This twin expansion of physical and social facilities was a result of explicit government policy as detailed in the plan of 1961. President Bourguiba was determined to take the benefits of independence to the people, most of whom lived in rural areas.

This very real transformation of public facilities was not, however, matched by improvement in individual incomes, which in the decade of the sixties actually declined for the rural population (Simmons, 1971; Zamiti, 1970). Social investment was financed by the government from domestic taxation and customs duties, supplemented by grants and loans from abroad. Individuals were left at subsistence level. It was significant that in Tadjerouine all the respondents in our survey had indigents' cards, and about a third of the community was getting some form of surplus food allowance in the spring of 1968. In short, the earnings of individuals from wheat farming, sheep herding, and mining were increasingly insufficient to meet basic needs. ^{2/} The contrast between apparent public prosperity and private indigence must

have had its effects on the aspirations, schooling, and employment of children raised during this period. The average boy on our survey was six years old at the time of independence in 1956.

Agriculture is the main source of employment, and the jobs can be divided into five categories: small landowner farmer, middle farmer, large farmer, tenant farmer, cooperateur, and agricultural day laborer. Agricultural day laborers own no land and therefore work the land of the large fellaheen. They were able to earn from 300-400 millimes (62-82 U.S. cents) per day seven days a week in 1968. A small farm usually contains from two to four hectares. During the time of the survey most of these small land parcels had been cooperatized. (After the survey took place, the program was judged a failure by Tunisian leaders, in September 1969, and the non-colon land restored to their owners.) The middle-sized farm is from 15 to 200 hectares and the farmer usually rents equipment to farm his land. A large farm generally has over 200 hectares, and the farmer owns his own equipment and hires day laborers to work the land. The former small farmers were the most common source of cooperateurs whose land was merged with that taken from the colons. In theory, a cooperateur earned 300 millimes (62 US cents) per day twenty-five days per month plus a share of the profits if there were any (so far there were none).

The chief crops on the land are wheat and barley, and the richness of the harvest depends on the winter's rainfall. Thus water is always a problem and one of the chief causes of insecurity in the agricultural life. In addition to dry wheat and barley, a small amount of irrigated truck farming has been encouraged near the southern end of the village.

Other work available in the region includes mining, industry, chantier civil, and the forestry service. In Djerissa, about 15 km. away, the iron mine employs 1,400 workers. Six hundred to seven hundred find work mining phosphates in Kalaa Djerda, about 10 km. distant, and thirty to forty are employed in a small mine north of Tadjerouine. Mine workers earn from 400-500 m. per day. The sole industry is a blanket and cloth factory at Sidi Amor, about 5 km. away, employing 400 workers at 500 millimes (US\$1.00) daily. A very few men are employed by the forestry service where they earn 580 m. a day but are only employed fifteen days a month.

Informal communication between individuals occurs chiefly in the four cafes. News is spread via the men who tell their wives. The wives soon spread all gossip among their own friends at tea time and nothing new remains so for long. The socioeconomic make-up of the clientele is mostly the same in each cafe but there is some differentiation in age rather than occupation. Boys begin going at the age of eighteen to twenty though the fathers try to discourage them for as long as possible because they would rather their sons not hear the stories passed around, not have them play cards, nor generally waste their time.

Formally, news is spread in Tadjerouine via the megaphone in the mosque which announces meetings and official gatherings of the associations in the town. For example, men can participate in the activities of the Destourian party cell. Almost all men are party members but attendance at meetings has dropped slightly in the last couple of years. There is in addition a sports association with teams for soccer, volleyball, and minisoccer. Activities are also organized through the Maison du Peuple, a town hall; its activities include a small library, music, art, dramatics, carpentry, and sewing. Primary school children may attend the Club d'Enfants, organized in the spring of 1968. There are, furthermore, teams for soccer, volleyball, basketball, and handball. In addition, there is a Union de Jeunesse and scouts for both boys and girls. Older youths have a club similar to the Union de Jeunesse called the Pionniers de la Republique.

The sole women's organization is the Union Nationale des Femmes Tunisiennes. The UNFT was begun in 1957 by the local Destourian cell. Young girls were given the leading positions as these were the only ones not wearing safsarias (veils) or able to abandon them. The women were very enthusiastic at first and almost all the women in town were registered. Here it was not difficult to get them out of their homes as everyone is related in Tadjerouine and the men have confidence that their women will not be compromised when they go to the UNFT. The early years of the organization were filled with classes in sewing, embroidery, the role of women in the home and hygiene. Previously, women knew nothing about these activities but nowadays there are many skilled women in both embroidery and sewing who can earn extra money working at home. Attendance has dropped in the last couple of years because the women have reached a highly skilled level in these crafts and their interest is no longer as easy to hold.

The schools. Although one of the reasons Tadjerouine was chosen as a research site was for what appeared to be its rather typical set of primary schools, on closer study we began to have doubts about how far they were representative. In brief, we found the teachers, and especially the directors, more concerned with the students as individuals than we had expected from our visits to other schools and from generalizations made by "well-informed" city dwellers about rural schools. Are the schools in Tadjerouine an exception to the urban and ministerial stereotype or are they closer to the average? This subject, however, requires further research. In the following paragraphs we will confine ourselves to the basic characteristics of the Tadjerouine schools.

The Kuttab, or Koranic school, has had an important, if shifting, function in Tadjerouine schooling and culture. While not officially recognized by the Ministry of Education, the meddib, the Koranic teacher, will give some of the children their first formal instruction in reading and writing. The students of the meddib learn the alphabet by copying the suras of the Koran on a piece of paper or a tiny slate. They usually chant the letters and words in the process. They will then recite from memory suras that they have

learned. Before widespread primary education, the kuttab normally had an eight-year curriculum and was full-time. Students were prepared to read and understand passages of the Koran, the only written material available. Individual instruction could continue if a student desired or he could participate in discussions of texts of the Koran at the Mosque. It was exceptional for a village boy with only Koranic instruction to go to Tunis for secondary school or to the Muslim university. The more usual route to further education was via the primary school.

The primary school has had its impact on kuttab enrollment. The teacher of the primary school has tended to replace the meddib in teaching reading and writing skills. Furthermore primary schools do not have a fee, although parents pay other costs—for books and blouses, for example—whereas kuttab lessons costs about a dollar a month. At the time of the survey the number of meddibs has gone down nine to three over the past 15 years. They teach in tiny, little-used, and poorly lighted spaces like storerooms, empty garages, or outside in sheltered corners of a building, weather permitting. Of the boys interviewed between 13 and 25 years old, 25 percent had attended at least one year of kuttab.

For these reasons, the demand for Koranic instruction has declined. But it has not, as the government implies in its publications, disappeared. Parents still send their children in the summers to get Koranic instruction. As the survey results will indicate in the next chapter, boys with kuttab teaching do not have a better change of high achievement in reading tests; the parents, however, cite religious instruction as the main reason for their children's attendance. Thus sufficient reason remains for parents' continuing to pay for seemingly outmoded kuttab instructions.

The kindergarten, begun in 1965 and run by the municipality, costs 500 millimes a month per pupil. It competes for some of the same students who might be sent to the kuttab, and has an enrollment of forty-five. Five of these places are scholarships provided by the municipality for children from indigent families. The purpose is to provide an organized structure for the child through free play, art, music, verbal development, and reading readiness instruction. The preschooler spends both his mornings and afternoons there, during which time he is treated as an individual with special emotional needs as well as personal qualities to be offered to the group. Such a daily experience may be a marked contrast to his home life where the child's emotional needs, especially if he is from a large family, can be largely ignored. He must, however, as part of the school group accept the gentle but firm discipline of the kindergarten. Run by three women, one a Peace Corps volunteer, the atmosphere is easy-going and warm. The joy in learning is in contrast to the fear found in the kuttab. But the child's first and enjoyable schooling experience is likely to be forgotten soon after he enters primary school.

The primary school seems to have replaced the mosque as the symbol of hope in Tunisian villages—at least for the 1950s and 1960s. In the

preindependence world where a man could feel that his life was almost totally predetermined, the mosque offered present solace and hope of an afterlife. Now men can envisage the possibility of self-determination for themselves and even more so for their children. Undreamed of income, security, prestige--and for some, power--all now seem to be a possibility within every man's grasp if he has "education." While for many the concept of education may be virtually limited to the idea that it confers the ability to make books talk, people can give illustrations of how education has, almost miraculously, made material dreams come true for their friends, as previously unknown economic and social opportunities emerged. The school, then, drawing on some of the same sources as Islam--hope and knowledge--has begun to satisfy some of the spiritual needs previously met by the religion. But given the rapid decline in high status, occupational opportunities for primary and secondary school levels began to fade in the mid 1970s.

Physically the primary school building is as prominent as the mosque in many villages; it is often set off from the closely packed houses and is noticeable for its large windows and concrete block walls. There are two major variations on its location. Some schools initially set apart, as were the schools in Tadjerouine, are now closed in by more recent buildings. Others are totally isolated in a field, halfway between two tiny clusters of ghourbis (adobe and thatch houses.) In Tadjerouine there are now three schools, one for boys and the other for girls, opened in 1912 and 1969 respectively, across a street from one another, and a coeducational school, En Najah, which opened in 1955. As funds have permitted, the schools have expanded from an initial one room to five or so. One enters directly from a courtyard into each classroom, with windows on two sides. The teacher's table is on a foot-high platform in a corner next to the blackboard. The students sit in pairs at three rows of double desks in a room that accommodates about forty.

We met with more than half the teachers and the directors of the schools to explore their personal origins, teaching experience, and views on education. Any changes in the system of primary schooling that the survey results might suggest would have to answer their needs and weigh their observations. While we did not try to measure teacher performance, it seems that from the standpoint of commitment to their students, the teachers could be divided between those who had been raised in Tadjerouine and those who had not. The former were more positive and more understanding of the students than those who were outsiders. Furthermore, they wished to remain in the community. We did not explore the causes for these feelings; some cited the nearness of relatives as a major factor in their preference. Also the directors of the two older schools were raised in Tadjerouine, were respected and involved in community affairs, and may have served as role models for the younger men. By contact with the parents, and their involvement in the community, the directors have given an example that closely relates their role to the social life of the community--a role that outsiders would have great difficulty establishing. Teachers who were outsiders were often hoping for transferral to a town or to Tunis. While local teachers can raise additional

and real problems involving accusations of favoritism toward boys from their own tribe, this has to be weighed against other benefits including their sympathy and commitment.

As part of our teacher interview, we asked what the teachers saw as national and local problems in education. As those members of the huge education bureaucracy most directly involved, they are more knowledgeable than many of the officials scattered along the ministry hierarchy. The teachers cited most frequently the poverty of the students' families as reasons for poor achievement; this was confirmed by our survey results for performance on French achievement tests but not for Arabic achievement. They particularly noted that in the poorer families, there was no reinforcement of school learning outside the classroom, school supplies were inadequate, and the diets poor. A fifth-grade teacher said: "I have some students who are very intelligent, but they often don't get enough food; they come to school with sallow faces. They stare into space or get sleepy instead of learning anything. I know these boys could learn...."

Family poverty also kept students from having sufficient school supplies. One teacher stated that one third of his students were well provided with pencils and notebooks, one third came half supplied, and one third brought nothing. The teachers make up such deficiencies from their own funds, although the ministry is beginning to make a contribution.

Another problem faced by Tadjerouine students and teachers is the cold. While the winters in the coastal cities are mild, in the inland plateau it is not unusual for the temperature to fall below the freezing point after the first of November. While homes and cafes benefit from the heat of cooking fires and many people crowded into windowless rooms, the high ceilinged schoolrooms with their big windows do not; they are bitterly cold. Teachers constantly referred to the cold, saying that the students did not learn as much in the winter.

The lack of reinforcement of school learning is due in part to parents' inadequate understanding of the education process. This is true especially for boys who are full-day rather than half-day pupils because they live 5 to 10 km. away from the village. In this case their schedule limits their contact with their family. "They leave home at four in the morning, sit around at noon with no food. By the time they get home at night everyone is asleep and they have to knock to get in." And those parents who desperately want their sons to succeed in their schoolwork may be unable to help. "A father doesn't know how to help his son with the proper studying conditions. He doesn't understand the process of education." It was not unusual for the teachers to complain that "the level of contacts outside of class provides no reinforcement of the teachers' efforts." Many parents sense this frustration and the drawbacks of their isolation from the village, and decide to move to town just for their children's benefit. They then walk out to the fields each day, and during the harvest may sleep there to save time and guard their crops.

After family poverty, the local problems that was commented on with second highest frequency was the unattractive social and intellectual atmosphere for the teaching staff. For the teachers who have family there, it is not a problem, but they are less than one third of the staff. The others have few people they can talk to, and these are often the other outsiders in the village, such as the national guard. Since Tadjerouine is larger than neighboring villages, and is on a paved road, the teachers' conditions are not as bad as they could be. In the more remote areas they often have to walk into towns like Tadjerouine to get food since they are not farmers; fresh food, including bread, is often not available. One teacher felt they should have compensation for being posted in rural areas. He said, "To be a good teacher, you must have something interesting to do out of class. You can't sit and prepare the class records all the time." Several of the teachers appreciated the professional and psychological benefits of the monthly meetings with the ministry inspectors. These make rounds to observe the teachers and discuss their needs. Teachers from the more remote villages without roads that are passable in the winter, come in also to join the others in giving "demonstration lessons."

Tadjerouine is probably unusual among villages because there are some empty seats in its classrooms. When a teacher feels that a student should take the year over again, the director often decides to pass the student on because "there have to be 40 students in a class." This norm of 40 apparently cannot really be adhered to closely: none of the classes in 1968 had 40 students. It probably reflects the director's desire to even out the distribution of students among the six grades, since children usually tend to drop out in the first few years, leaving smaller and smaller cohorts. It may also reflect the director's desire to give the children as much schooling as possible before they drop out.

Almost all of these problems should be alleviated to some extent when the planned secondary school is built in the village. The school would not only provide jobs during the construction--which would take several years--but also steady income for families that board students and supply the school's needs. Thus the new school could significantly reduce poverty. Furthermore, the social life of the primary teachers would improve with a larger group of unmarried secondary and university graduates.

The following table 3.3 summarizes the number of students, classes, and teachers in 1968. While we do not have census figures for the villages, we would estimate that 95 percent of the school-age boys and girls have attended school at least for a year or so.

Table 3.2
School Enrollment
(Spring 1968)

School	Teachers	Classes	Students			Students/Class
			Male	Female	Total	
Boys	12	16	456	36	492	31
Girls	10	14	33	466	499	36
Mixed	3	5	137	33	170	34
Total	25	35	626	535	1,161	33

Note: The traditional names for the schools are now misleading since they are all coeducational. Ten of the teachers have classes that come only for half the day. They therefore are responsible for 20 classes a day, and the other 15 teachers have a full-time class.

Visits to the classrooms of the Tadjerouine primary schools revealed a considerable diversity in teaching styles. At the same time, certain themes were common to the classroom atmosphere and presentation. Several examples from classroom observation may illustrate these points. Student fear is a common characteristic. In a fourth-grade classroom arithmetic was taught in French. The teacher called a student to the blackboard to do an exercise. The boy reached the board but had not understood the exercise; he then began to shake from fear of being struck. In an Arabic class students covered after giving wrong answers and were punished by a sharp twisting of the ear. The tool of fear shapes many results. One is that it encourages students to check their results with their neighbors. This is also common during exams. Even at the national exams, used for entrance into secondary school and graded on a regional basis, we learned it was common for the teachers who were grading to alter the results.

In some classes the students seemed to be enjoying the lessons. One dynamic, but soft-voiced, teacher did not need to tell the students to be quiet. In correcting mistakes, he toured the room and pointed out errors individually and unobtrusively. He patted his students on the head and smiled frequently. During the oral responses he was patient, allowing the slower students the chance to respond.

But the basic method for teaching is the classroom drill. The teacher gives a problem, and the student is expected to write the response on his own little blackboard. The scene is usually the following. The teacher

of arithmetic presents a problem orally. All the pupils are expected to be watching him intently. He bangs his ruler on the desk, and all immediately begin solving the problem. He whacks his desk a second time. Everyone raises his blackboard over his head so that the answer is facing the teacher. At a glance the teacher can thus survey the answers of all 35 students and take appropriate measures. On the third bang of the ruler all blackboards are lowered onto the desk and erased, much as his men would prepare, raise, and lower their rifles at the command of a drill sergeant. This behavior has a certain utility for the socialization of future workers.

This brief description suggests that imagination, creativity, or spontaneity of response are on the whole lacking. Discipline is generally administered by physical force. Learning is motivated by fear rather than curiosity. In this manner the primary school child is "prepared" for secondary school or to go out into his society, either when he drops out or at the end of the sixth grade.

Following primary school the student may, however, if he passes his entrance examination, enter secondary school—either the seven-year lycee track leading to the baccalaureat or the three year college moyen ending in a brevet. Both require leaving home. In 1967, six out of ten sixth-graders passed the exam to enter. Secondary education is usually taken in Le Kef or Maktar but occasionally as far away as Tunis if the student happens to have relatives there. For boys, leaving home poses almost no problem except that they are separated from the sanctions of the home and community. The all-male milieu of the dormitory is hardly a substitute. The village boys have many problems, but a major one often leading to dropping out is lack of money. The separation from Tadjerouine is often the cause of failure when the young student faces his first adjustment to living away from home. For the girls, the sixth grade is the end of school, and of seeing non-family boys until marriage. Tadjerouine parents have little confidence in the influence of city life on their daughters. Although a few scholarships are available, the rural boys who survive the rigors of boarding school come from the better-off families and have learned how the system operates to gain success.

In 1967, 60 percent of those taking the entrance examination passed. But then only one out of three who passed was young enough to get admitted. Therefore, only 20 percent who took the exam entered secondary. Several primary teachers emphasized that there were no opportunities for young men just out of the sixth grade, although it is legally possible that a boy can enter the local police or national guard after the sixth grade. Of the 20% who do go into secondary probably all would return within a year or two, having dropped out. These drop out students must then choose vocational training, or an apprenticeship, or unemployment. A few students could find places for further training at the agricultural school in Sidi Bouris or the textile training school in Sidi Amor. The majority, however, must either enter farming, become apprentices to their fathers, become day laborers, or join the government work project. For the post-primary youth who does not

continue his education, the social and intellectual environment of Tadjerouine once again becomes a major influence. Successful passage through a number of years of education raised his expectations, especially if he has had some secondary, but as a drop out of 17 or 18, he must return to live with his family, unable to join the adult world because he is both unemployed and unmarried, and with very poor prospects in both areas. Furthermore, he learns that the skills taught in school are of little interest to potential employers; neither is an apprenticeship certificate because of its poor quality. While schooling may have socialized him to accede to the general will, it may also have left him cynical about the personal benefits. With this general background, we now turn to the specific characteristics of the sample.

Home Background

Because of the potential importance of the parents' socioeconomic status in explaining the amount and quality of the son's schooling, we carried out a separate interview with the head of the household. Except in several cases, this was the father. The goal was to examine the fathers' social characteristics and their opportunities for informal education.

When interviewed the average father was 51 and the mother 43 years old. The age differential of eight years between mother and father is common for Tunisia, signifying the length of time required for a man to achieve sufficient material well-being to take a wife. The average number of living children was seven per family. This may seem high, but that is because it is compared to a total population that includes a proportion of infertile men and women. The women have had little formal education and only 18 percent of the men have had any schooling. The houses are crowded--with almost four persons per room--and the average amount of money to spend on each member of the family is low--3.077 dinars/month, or \$5.87. The main sources of income are cereal farming and sheep herding, the man being owner, or tenant, or laborer.

The opportunity for informal education of parents has been significant. The parents do travel to the closest town, Kef, about 20 km. away and also to Tunis, 200 km. distant. But only 22 percent of the fathers travel outside the village once a month or more. While 6 percent of the fathers never travel, 64 percent of the mothers do not. The parents' use of movies and newspapers is much less than their use of radio. While about 70 percent never listen to the radio, almost everyone either owns a radio or has access to one. The closest cinema is in Kef. Women and men seem to go to the movies in about the same proportion. (See appendix table 3.1.)

Student and Workers

The sample of 80 respondents has few characteristics that would distinguish them from those of other villages with similar economic characteristics. The average boy was almost 18 years of age when interviewed

in 1968 and was born in the village. He was unmarried and lived at home. Five boys in the survey had married, all in the three years prior to the survey. Three of them had children. When his child was born the typical father was 32 and the mother 23. Fifty-five percent (n44) of the boys interviewed were still in school. Of the boys out of school (n36), only 42 percent (n21) had employment ten months of the year or more. The sample is not unlike adolescents in other rural societies in the third world.

From the sample, 25 percent had attended the kuttab for a mean of 2.7 years. While most boys went for a year or two, one had eight years.

All but three of the sample attended primary school. They usually entered at the age of 6 or 7, although 14 percent of the sample were 9 or 10 when they started. In theory, students cannot remain in primary longer than age 15. This rule, however, is often overlooked, if the influence of the parents is sufficient or if the schools are not crowded. Even though the average boy entering at age 7 had the tendency to repeat two years in primary, he has a good chance of not exceeding the age limit before finishing primary. The boys who are either 8 or 9 when they enter, or who repeat 3 years, have little chance of entering academic secondary because they are 16 or 17 on leaving primary. Their only opening then would be to attend college moyen, technical school, or an apprenticeship training center.

Repeating years of school is a serious problem at all levels of Tunisian education. Thirty six percent of the sample repeated a grade once, 30 percent repeated twice, and 11 percent repeated 3 times. Eight percent repeated four to six times. The impact of repeated failure on the student needs careful consideration. Does it encourage lower class and rural alienation from the middle-class urban society? While there is no evidence for the effects of the repeating, or failure, syndrome in Tunisia, data from elsewhere would strongly suggest that it incurs heavy psychic costs (Biern et al., 1971; Schreiber, 1967). Repeating also affects his parents, peers, and teachers. Understanding this failure syndrome is central to understanding the social costs and benefits of the socialization process in the classroom. What kind of contribution do these "failures" make to their families and their communities? The tendency to have a boy repeat the early grades rather than to promote him usually means that he cannot pass the primary certificate. Not having this certificate means that he is prevented from applying for many jobs.

The dropout problem is equally serious. About 30 percent who started primary in Tadjerouine will have dropped out before completing sixth grade. These figures are identical to the national average. The national ratio is that about 70 percent of the students who start primary finish the 6th grade, and about 25 percent who finish the sixth grade get into seventh. Thus about one student makes it into secondary of the five who started first-grade primary. And the student who makes it into seventh grade has only a 10 percent probability of completing twelfth grade.

The Sample's View of Schooling

The interview probed the opinions about the school discipline, homework, changes the boys would make in the school, and the reasons they gave for leaving school. They were asked open-ended question; that is, they had to offer a response rather than agree or disagree with a prepared response.

The sample of 80 tended to do their homework at home, but 25 percent replied that they worked either in the cafe or under the street lights to obtain sufficient light. Fifty-eight percent complained about problems that they had with their homework. The problems included lack of assistance, (20 percent), insufficient light (25 percent), and too much noise (13 percent). Forty percent asked for and received help on their homework; 75 percent of help received came from family members.

The quality of the homework assistance that the sample received was also described. The helpers' education ranges from on to six years of primary and the mean was 3.6 years. The type of assistance was categorized as follows: 6 percent got encouragement without actual help in the assignment and 34 percent got direct help on the assignment, while 60 percent got no assistance.

We asked the boys what improvements they would like in their school. Twenty-four percent wanted the poorer students to receive assistance. Whether they meant students from indigent families or the ones who are low achievers was unclear. Forty-five percent also desired additional courses and extracurricular activities; and 35 percent, improvement of the teaching and facilities.

We asked the students their opinion of the "main reasons a student fails" in school. The replies to this question are consistent with the answers to the previous questions on the desired improvement. Almost 80 percent felt that the individuals are to blame, while only 4 percent felt it was the school's fault. The responses seem to suggest why students think their peers fail. The school teachers and facilities are not blamed for failure, but the students themselves are. The individual reasons included such characteristics as: desire to play, did not do homework, laziness, illness, low intelligence, and began school too late. While the last one could be categorized as a family reason, since it was a parental decision, it could also mark individual motivations and ability. The "family reasons" included poverty, poor homework conditions, and lack of parental encouragement.

We asked about the role of discipline in the schools by asking, Should the teacher give physical punishment to a student who has misbehaved in class? We then followed with the question, Were you unjustly punished in primary school? The sample approved of physical punishment but only in exceptional circumstances, and expressed the feeling that most of the past punishment was fair. Only 15 percent felt there should never be physical punishment.

The media is a potential source of informal education. The sample's exposure to mass media is tabulated in table 3.3. The results show, in order of importance: radio, movies, television, and newspapers. It is interesting that the one medium which uses school-trained skill—newspapers—is the least used. It was unclear whether or not the reason is a lack of motivation.

Table 3.3

Rural Boys' Mass Media Exposure
(Percentage of n80)

<u>Variable</u>	<u>Low</u>				<u>High</u>
	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Movie attendance	6	0	18	20	56
Radio listening	na	9	45	46	na
TV viewing	33	18	34	16	na
Arabic newspaper	na	36	51	13	na
French newspaper	na	44	40	16	na
Paper from friends	na	41	6	53	na

Note: Variables coded:

- Movie: 0 = never; 1 = 1,x/yr; 2 = 3-12x/yr; 3 = 13-49x/yr;
4 = 1/wk or more.
- Radio: 1 = never; 2 = time to time; 3=Often.
- TV: 0 = never; 1 = rarely, 1,2x/month; 2 = often, 2-3x/month;
4 = 1/week or more.
- Newspapers: 1 = never; 2 = time to time; 3 = regularly.
- Paper from Friends: 1 = never; 2 = time to time; 3 = regularly.
- Na: Not applicable.

What is the sample's view of the utility of education in their obtaining and holding employment? We first asked, What is necessary to find stable employment? Only 29 percent said, a primary education. Forty-five percent felt having a skill was necessary, while 26 percent said family influence was the essential element.

We then asked, In your opinion, what is the minimum level of education necessary to find a job suitable for someone like yourself? Thirty-five percent replied that primary or less was the minimum. The other replies are listed in table 3.4.

Table 3.4
Minimum Education for Suitable Job
(n80)

	<u>Percent</u>
Education not needed	1
Primary: 1-5 years	8
Primary diploma	26
Secondary: 1-2 years	9
Secondary: brevet	44
Secondary: bBac. pt. I or II	13

The purpose of these questions about parental characteristics, amount of schooling, mass media exposure, and various attitudes about the students' schooling experience, is twofold: first, to gain an idea of what the results are; second, to use results for comparison with the sample from the suburb and possible comparison with other studies in Tunisia and elsewhere.

We asked the 36 students who had left school why they had done so. The responses were evenly divided between the three categories of answers. Only one-third said they left school because they did badly. The rest blamed either the school or their family conditions.

Eighty-one percent of the rural workers (n=21) completed the six grades of primary school. They have been out of school for an average of five years and have been employed for an average of three years. Only 38 percent of the sample had irregular employment during the twelve months before they were interviewed.

Employment is difficult to define strictly, since many apprentices work for little or no pay for several years or work intermittently according to the season. The main jobs available in the village are either in agriculture or commerce. The present occupational categories of the sample included non- and semi-skilled (48 percent), skilled, low-level officials, tradesmen (43 percent), and teachers, and middle-level officials (10 percent).

The salaries of the sample are modest. The monthly mean is 18.762 dinars, equivalent to \$39 in 1968. The standard deviation in monthly earnings (10.162 dinars), however, is important. The chapter on earnings seeks to explain this variation.

La Goulette: An Urban Suburb

The urban sample was drawn from the community of La Goulette, the main port of Tunis. It is located on a narrow peninsula, 15 km. from the city. Employment opportunities for the population of about 10,000 are at

the docks, and in fishing, as well as in administrative, commercial, and professional jobs both in the suburb and Tunis.

We selected the town of La Goulette because it was a part of metropolitan area of a major city and the families covered a socioeconomic range. Unlike some suburbs that are mainly one income group or another, La Goulette seemed to offer the opportunity to sample families that included recent migrants, settled low-income groups, and members of the middle class. We expected the town to be representative of the range of family occupation and schooling opportunities in other major African and Arab suburbs.

The history of the city dates from the eighth century, when a canal was built connecting the lake of Tunis, on which Tunis is located, to the sea. A commercial peak was reached in the late nineteenth century, encouraging a major immigration of Italian and Maltese fishermen and craftsmen. Before 1830 the inhabitants were mainly Turks and Moors; by 1892 the French government established a vice-consulate, and the Sisters of St. Joseph opened a school for foreign children.

When around 1900 the channel connecting the lake of Tunis and the sea was deepened, the shipping and related activities went into a decline. But the construction of an electric train connecting Tunis, and of loading docks for mineral exports a few years later, tended to stabilize economic growth. Other activities included fishing and summer vacations of the Tunis middle class. By mid 1960s, the port was being expanded to become the larger of the two port facilities.

The characteristics of the population continued to change in response to the economic and social conditions. By 1930, the situation could be summarized by national origin: the Italian and Maltese fishermen, the French colony which was employed in commerce or administration, a Jewish community of small merchants and artisans, and finally a group of upper-income families, usually Tunisian, who were mainly in commerce. With the advent of the worldwide depression of the early 1930s and low prices for agricultural products, rural folk from the west and north moved to La Goulette in search of work. Another major change in population occurred in the mid 1950s as the French and Jewish communities left because of independence and the government control of commerce. By 1960 the government nationalized the Italian controlled fishing fleet and prohibited the annual procession to the Virgin Mary; few families of Italian descent are now left in the town. The homes vacated by the Europeans were quickly filled by immigrants from the Sahel district of the country. Many had been notified by relatives living in La Goulette that jobs and housing were available.

The standard of living of the present inhabitants ranges from the grim poverty of the unemployed to the affluence of the middle class. The poorest tend to be the migrants from the west as the migrants from the Sahel in the South seem to arrive with non-agricultural abilities. The income

differentials and other social characteristics are characterized by the type of housing that the groups use. The middle-income groups, including the summer residents, live in European-style villas in the section of town with tree-lined streets. Many of the lower-middle group live in the petite sicile section which is surrounded with a high wall similar to an Arab medina. The houses, however, reflect the styles of southern Italy. Some of this income group also live in low-cost government housing nearer the center of town. The lowest-income group have built one room gourbis from secondhand materials on the edge of the lake of Tunis. Their living conditions are typical of migrants found on the outskirts of major African and Arab cities.

The communications opportunities contrast sharply with those available in Tadjerouine. There are two cinemas, television began in 1966, and a large number of newspapers and magazines are available in both French and Arabic. Over 100 families have telephones, and another 100 are located in stores and offices. While the number and nature of public organizations are comparable with those in the rural community—La Goulette has its Cell of the Destorsuian Socialist Party (PSD), Parent Teachers Association, Mosque, and national women's organization (UNFT)—the proportion of the community participating in them is less than for those same organizations in Tadjerouine. The cafes in each neighborhood are the main gathering places for men.

The range of pre-primary and primary schooling opportunities are similar to those offered in the rural community. In addition, La Goulette has secondary facilities, and students can commute daily to the university in Tunis. The pre-primary opportunities include four kuttabs and two jardins d'enfants. After the expansion of primary education in 1958, the kuttabs began to reduce their activities from the full primary cycle to teaching at the pre-primary level and during the summers and to providing religious education during the summers. The jardin run by the UNFT with city assistance was set up in 1966, while the one run by the Sisters of St. Joseph began around 1960 when the end of French assistance forced them to close their primary school. Both jardins have about 80 students each, and the sister jardin is conducted in French. Both charge fees--the UNFT \$3.00 per month and the Sisters \$2.00 excluding lunch.

The town has two large primary schools with a total enrollment in the six grades of about 2,200 students, of whom 35 percent are girls. The larger of the two schools has 19 instructors, of whom 5 in 1967 were French. The French director was replaced the previous year. The proportion of Tunisian teachers has been increasing since the early 1960s. The Tunisian teachers have usually had three years of secondary school and then three years of normal school and a year's practice teaching.

Overcrowding is a problem. For the first two years the students only attend half a day, from 8-11 a.m. The last four years, if they get that far, they would also attend the 1-4 p.m. session, making a total of 30 class hours a week.

As with the jardins and the kuttab, students whose parents can afford to pay get extra benefits. At the primary level students get an hour of supervised study after school for a \$1.00 a month. The evidence from chapter 4 will suggest that the benefits from tutoring beyond this supervision of study were insignificant in cognitive achievement.

The opportunities for non-school activities are as numerous as those in the rural community if not more so, owing to better financial support from parents. In addition to the usual sports teams that play schools and a chapter of the scouts which is sponsored by the Destourian party, there are also summer camps organized originally by the school and after 1967 by the party.

While there is no six-year secondary school in town, there are two technical schools (colleges moyens) with about 500 students, a school offering the first three years of the secondary cycle, and a private commercial and technical school, offering courses throughout the year. Tunis has the closest full six-year secondary school. Many students commute daily to attend a range of schools at the secondary level in Tunis.

The socialization of the youth differs from the rural community, and several characteristics can be suggested by examining use of leisure time. In the lower-income areas of the town, the patterns of activity of the women appear little changed from the rural community. They visit one another from house to house, and seldom go into the commercial areas. In the middle-income areas, women can be seen going to the beach, walking with their husbands along the street, and sometimes attending a movie. The usual segregation of sexes by activity seems for this group to be changing. Adolescent boys and girls are seen together at the beach or going to the movies, relationships that would not be permitted in the rural community. The program of the promotion of women led by President Bourguiba, along with the increased exposure to European mores and possibilities of employment, have encouraged changes in the traditional behavior of women.

The sample method of choosing families in La Goulette by house type is similar to that used in Tadjerouine and will not be repeated here. Information on 176 boys and their fathers was collected by separate interviews. Of this group 88 boys were still in school and 88 were out of school. Of the out-of-school group, 37 were employed and 51 were not. Thus the rate of unemployment for the out-of-school group was 58 percent. Based on the data for comparable age groups, the 176 are probably about 5 percent of the age group living in the suburb. No systematic information exists on emigrants of the group.

Home Background

Interviewing the fathers was central to obtaining as accurate information as possible on the parents' standard of living, income, and other characteristics. If the sample included two boys with the same

father, the father was double-counted. For the 176 boys, we interviewed 110 fathers. The average father is almost 50 years old and the mother 43. They have about six children, which is one child less than the mean for the rural parents. The persons per room of the house are about three while in the village there were almost four. While the fathers' salary has a broad range, it averages almost 30 dinars (62 dollars) per month, double the average salary in the village. The same differential is true for family income. While many of the fathers had either kuttab or primary, the fathers' schooling was usually limited to several years—the same as the rural sample and an insufficient amount to gain a useful level of literacy. For the mothers, only 16 percent had any schooling. This suggests that from the 1920s through 1940s, the school opportunities for low- and middle-income Tunisians were virtually nil.

The opportunity for informal education--learning possibilities that occur outside organized schooling--is significant. Many of the sample made use of the opportunities. That 43 percent of the fathers go to Tunis every day underlines the suburban nature of the community; however, almost 40 percent of the mothers said they never go to Tunis. Movie attendance by both parents is low, with about 60 percent replying that they never attend. This is only about 10 percent lower than in Tadjerouine, where no cinema was available locally. Thus the mere availability of the movies in La Goulette appears to have little impact on frequency of attendance. While more fathers in the suburbs listen less to the radio than fathers do in the village, the newspaper reading is about the same.

Characteristics of the Boys

The 176 boys of the sample, who ranged in age from 15-25, seem to share characteristics that might be considered common with boys in similar suburban communities in other major cities in developing countries. The average boy was eighteen years old, unmarried, and still living at home, similar to his rural counterpart. Only 36 percent were born in villages and towns of less than 30,000, and 42 percent were born in towns and cities over this figure. Thus, more than 60 percent of the boys were migrants. While this may seem to be a high figure, the fact is that greater Tunis, like many other cities in the developing countries, has more than doubled in size in the twenty years since independence.

The school experience ranged from boys who had no primary schooling (4 percent) to those who had finished the secondary (9 percent). Percentage of the sample that attended some form of post-primary schooling was high: 39 percent attended secondary, 18 percent attended technical school (college moyen), and 10 percent went to the apprentice centers. Thus, almost 60 percent got academic schooling after primary.

Now we turn to a discussion of the boys' views of schooling at the primary level. The interview probed their opinions about school discipline, homework, changes they would make in the school, and their reasons for leaving school.

Children who have the opportunity to receive assistance on their homework, it is thought, may have an advantage over others who do not. Sixty percent replied that they had not had problems with their homework. Only 11 percent noted a lack of assistance on homework, about one-half the level noted in the village.

The quality of the homework assistance was also questioned. We found that the helpers' education ranged from one to six years of primary, with about four years being the average--slightly higher than the rural sample. The number complaining about the quality of the assistance was about the same as in the village.

The students perceive that their peers and their background, rather than the teachers or school facilities, are to blame for failure. This student opinion, while not thoroughly examined in the present study, is consistent with other data in the study. The "social and general" category included reasons like bad company, frequent distractions, bad luck, and the fact that the primary or moyen cycle ended. The "individual" category included such dimensions as: "the desire to play, did not do homework, laziness, illness, low intelligence, and began school late." While the last reason could be categorized as a family reason, it could also mask individual motivation and ability. The family reasons included poverty, poor homework conditions, and the lack of parental encouragement.

To the boys who had left school we asked the additional question, Why did you leave school? The boys tended to feel that it was more the individual's fault for leaving (56 percent) than the school's (29 percent). Economic and family reasons were least important (15 percent). The rural results for the same questions were evenly distributed between the three categories.

We asked what improvements they would like to make in their schools. The distribution of the replies was similar to that in the rural sample. The major difference was that improving the personnel and the facilities was first in importance, replacing a desire of the rural sample for additional activities.

How did the students feel about classroom punishment? The responses were almost identical to the rural sample. They felt that physical punishment should be meted out only in exceptional cases and that individually they had not been unjustly punished.

A major source of informal education is the exposure to mass media. While theoretically it is seen as both a motivating mechanism for attaining more formal schooling and as a reinforcing mechanism for maintaining cognitive abilities and behavioral attributes, the evidence supporting this theoretical position is not conclusive; nor will the data in chapter 4 support the cognitive models.

Table 3.5 below shows the relatively high levels of exposure to the movies and TV, followed by the radio, and finally the newspapers. One reason why the level of newspaper readership is as low as it is, is because-- as we shall see in chapter 4--a small proportion of the sample did not reach a sufficiently high level of schooling to be able to read and understand the newspapers. Also, as we shall see in chapter 7, when they left school some of them did not retain the level of cognitive ability they had reached when in school.

Table 3.5

Urban Boys' Mass Media Exposure
(Percent Age of n176)

<u>Variable</u>	<u>Low</u> 0	1	2	3	<u>High</u> 4
Movie attendance	2	1	11	17	70
TV viewing	3	10	31	56	-
Radio listening	-	11	51	38	-
Paper from friends	-	43	15	42	-
Arabic newspaper	-	67	24	7	-
French newspaper	-	42	27	32	-

Note: Variables coded:

- Movies: 0 = never; 1 = 1-2x/year; 2 = 3-12x/year; 3 = 13-49x/year; 4 = 1/week or more.
- Radio: 1 = almost never; 2 = time to time; 3 = often.
- TV: 0 = never; 1 = rarely, 1-2x/month; 2 = often, 2-3x/month; 4 = 1/week or more.
- Newspapers: 1 = never; 2 = time to time; 3 = regularly.

The sub-sample of urban workers (n37) has a mean age of 21 years. They have been employed for three years. Sixty-eight percent of them completed six grades of primary school. Although the age range is 14-25 years, none of them is married.

The occupations of the workers, ranked according to occupational prestige, indicated that they were mainly distributed between low- and lower-middle occupational ranges measured on a monthly earning basis. The "tradesman" category contained only a few workers and included shopkeepers and street vendors. One of the workers was employed but gave no salary. It is not unusual for apprentices to work without pay for a year or so. The sub-sample included non- and semiskilled (40 percent), skilled and low-level officials and tradesmen (46 percent), and teachers and middle-level officials (14 percent).

The workers' salaries are modest. The monthly mean is 29.568 dinars which is equivalent to \$56.40. The standard deviation is 19.280 dinars. Yet the suburban mean is 60 percent more than the rural average for the same age group, making the fact that rural people want to immigrate not at all surprising. For the purpose of the analysis, we assume that the workers have no other earnings than their salaries.

The variance in education across the sample is considerable--as is shown in table 3.6. While 68 percent have had some form of secondary training, only 8 percent held a diploma from either the technical or the secondary school. Eight percent have had no education, and none has had any higher education.

Table 3.6

Education Level of Urban Workers
(n37)

	<u>Percent</u>
No education	8
Primary: 1-5 grades	22
Primary: 6 grades and diploma	8
Secondary: 1,2 grades	49
Secondary: 3,4 grades	8
Secondary: 5,6 grades	11
Higher	0

Note: Secondary, for this table only, includes technical and apprentice.

In summary, the description of the community and the profile of the sample suggest several points. First, the community has a range of social classes that tends to be a typical of the usual stratified suburb. This range was useful for the sample since it did not limit the variation in the family backgrounds of the students. Second, the community is not a stable one in the sense that the majority of the more than 60 percent of the sample was not born in the community. This instability is probably characteristic of other suburbs of the city, and is a once-and-for-all phenomenon based on the internal migration patterns triggered by independence factors. Third, the sample of 15-25-year-olds is split between boys still in school and those out of school. Compared to the rural sample, a larger percentage (almost 60 percent) attended some form of post-secondary primary school.

Footnotes

- 1/ The tests were designed with the assistance of Salah Garmadi, Department of Linguistics, the University of Tunis. The lack of objective achievement tests, or lists of common vocabulary, prevented our using a standardized test. Each item on the tests contained a short passage of text, a question on the text, and three alternative answers to the question. The respondent circled one answer. While this is not a usual examination method in Tunisia, pretesting indicated that it did not confuse students. The results, which were analyzed for both item difficulty and item discrimination, indicated that there were no weak items. The Kuder-Richardson 20 reliability score for the Arabic test was .69 and for the French, .65. While these scores are lower than for highly standardized American tests, they are adequate for our purpose.
- 2/ On the basis of fragmentary information on food production and unemployment levels in the first half of the twentieth century, it is possible to conclude that the rural population had small increases in their real standard of living until the early twenties or thirties when world prices for commodities declined. There has probably been little basic change in diet during the past forty years. See footnote 2, chapter 2, for the relevant citations.

Chapter 4

Determinants of the Cognitive Achievement of Students

Improving cognitive achievement is the main objective of teachers and students around the world. If students can obtain high scores on achievement tests, this assures their passage to the next grade and, finally, the much sought-after certificate. Previous research has shown that more years of schooling and more certificates are associated with higher lifetime earnings. ^{1/} Thus improving cognitive achievement is considered a central link to job security and higher income.

More recent research, as we have indicated in chapter 2, has begun to question how tight the links are in the causal chain of more schooling and higher income. Studies (Gintis, 1971) have shown, for example, that workers from the same socioeconomic background and with the same amount of schooling are mainly paid for noncognitive personality characteristics which are learned both at home and school and not for the cognitive skills taught at school. The economic and psychological findings indicate, therefore, that other factors being constant, the more years of schooling, the better the chances of learning the personality traits rewarded by employers.

In this chapter we will examine the determinants of the first link, cognitive achievement. These include family background, amount of schooling of different types, and student personality. Using Tunisian data, we will argue that students' scores in French and Arabic reading comprehension are best predicted by family background and individual personality factors. The years the students have spent in school are not significant in predicting their Arabic comprehension and are only modestly significant for French.

The model to be tested derives from the education production function used in previous research (Bowles, 1970; Alexander and Simmons, 1974). A student's scholastic achievement is a function of characteristics of the school, the family, and the student. Our goal is first to test the traditional model and then to modify the model by specifying in an African society the significant inputs contributing to school achievements. The intent is the isolation of policy variables to improve resource allocation in education. The general form of the causal model is:

The model indicates there are two types of output from schooling: cognitive achievement, part of which we measure with reading comprehension tests in Arabic and French, and other personality attributes. 2/ Cognitive skills include the ability to manipulate words and numbers, assimilate information, make logical inferences. Schooling is measured by the years in pre-primary (kuttab), primary, and secondary schools that the sample attended; the length of schooling should affect levels of cognitive achievement and noncognitive skills. The amount of schooling is determined by a complex of factors which are summarized into the categories of family background and student characteristics. Because of the small significance that school inputs had on a student's achievement in previous studies (Jencks, 1972; Simmons, 1974), it was reasonable in this pilot survey to concentrate on the non-school factors. The results obtained justified this decision.

The model is a simplified presentation of what actually happens. Some arrows have been omitted for clarity of the diagram. There is probably a success syndrome, for example, in which increased cognitive achievement promotes positive personality reactions which then lead to achieving more years of school. Other possibilities of reverse direction should be noted. A child's schooling, for example, could improve the quality of the family environment by bringing home ideas and materials which could be interesting or useful. 3/

We will test several hypotheses that are based on the conclusions of recent Western studies (Central Advisory Council, 1967; Jencks, 1972) as well as the few studies on school achievement in the third world (Alexander and Simmons, 1974). Three major hypotheses state the categories within which we will examine some of the characteristics of cognitive ability. First, we hypothesize that the socioeconomic status of the student's family is a proxy variable for dimensions of the home environment that affect the student's cognitive ability. Next, we hypothesize that the personality of the student ("personality" here including motivation and interpersonal relations) is a causal factor in determining the level of his cognitive ability. Finally, we hypothesize that the schooling that the student has had, including both the years of attendance and the final level reached, is a causal factor in determining the student's cognitive level. 4/

The level of schooling of the sample range from four year primary to completion of secondary, the mean grades of schooling for the rural sample are 7.9 (SD 1.9) and for the urban, 8.6 (SD 2.4). The distribution of the sample is described in table 4.1. Almost equal proportions of students are in academic and technic schools, reflecting the nationwide norms for the percentage of places available.

TABLE 4.1

Educational Experience of Students
(percentage)

	<u>Rural (n44)</u>	<u>Urban (n 88)</u>
Less than 6 grades of primary	5	8
Attending sixth grade of primary	18	11
Attending technical school	25	25
Attending secondary school	52	56

Note: Technical school includes both college moyen and centre de preapprentissage.

The level of cognitive achievement, or literacy, of the sample varies significantly between rural and urban students on both the French and Arabic tests, as seen in table 4.2. Among the students who are still in school, we find that 53 percent of the rural sample are literate in Arabic, while 62 percent are for the urban sample. The gap between urban and rural is even wider for French achievement.

The rural sample had a mean of 7.5 grades of schooling, that is, the typical student had completed primary and 1.5 years of secondary, and the urban, about 8.5 grades. The range in schooling was from four grades of primary through the sixth grade of secondary. Given the average level of schooling, these are surprisingly low levels of cognitive achievement.

TABLE 4.2

Literacy among Students
(in percent)

	<u>Rural (n 44)</u>		<u>Urban (n 88)</u>	
	<u>Arabic</u>	<u>French</u>	<u>Arabic</u>	<u>French</u>
Literate	53	38	62	68
Semiliterate	39	50	24	29
Illiterate	9	11	14	3

Source: Appendix table 4.1.

Note: The levels of literacy are defined by scores or achievement tests (see appendix A). Full literacy is defined as passing five or more items or a six-item test, while semiliteracy is passing three or four items.

The Rural Students

One reason we studied a rural and urban community separately was to limit the possible effect of socioeconomic status (SES) of the families on the students' school achievement. Since the SES effect was so strong in the Western studies, we wished to explore more subtle factors that might have been subsumed by SES. The SES range in a rural African community is usually confined to the lower-income groups. A second reason was that by sampling one community where students had only three possible choices for primary school, and two choices for secondary school, we attempted to control for differences in achievement that might have been due to variations in teaching or physical facilities. Moreover, classes in the three primary schools were tested to see if significant differences existed between them in the achievement level of the sixth-grade students. We found that they did not. While limiting the universe to a single rural community restricted the size of sample, the hope was that this was more than offset by gains in accuracy of data and the insights obtainable. 5/

Our analysis suggests a remarkable finding. The amount of schooling that the boys have had explains little of the variance in the three achievement scores - Arabic, French, and arithmetic. In other words, with the exception of French performance, non school factors tend to determine why some students do better than others on the tests. This finding is consistent with other research on both developing and developed countries (Simmons, 1974). We now turn to a closer examination of the findings.

French Achievement

Using the measures and methods described above, we examined the effect of three major factors as possible determinants of French achievement: schooling, family background, and personality. (A full description of the items measuring each of the factors is found in appendix C. The result of the tests of cognitive achievement are given in appendix table D.1, and the statistics for the rural sample are in appendix table D.2.) The significant determinants include length of time at either the secondary or technical school and two personality characteristics. Comparing the effect of the school factor with personality, in table 4.3, we find that personality is a stronger predictor of French achievement than amount of time in school. No background items were significant. Before turning to an explanation of these results, we need to discuss the analytic method.

Throughout the study we have used regression analysis to hold constant the effects of the independent variables in order to determine their contribution to the "variance" in the dependent variable, e.g., French achievement (See appendix B for a full discussion of regression analysis). For example, we see in table 4.3 that the more years of secondary school attended, the higher the score because the "direction" was positive. If it had been negative, we could have said the lower the years of schooling, the higher the score. The

total variance to be explained is 1.00. Thus, secondary school attendance explains 10 percent of the variance and technical another 5 percent, totaling 15 percent. In other words, non-school factors and errors in measurement explain 85 percent of why some boys did better in French achievement than others.

TABLE 4.3
Determinants of French Achievement
for Rural Students

<u>School</u>	<u>Direction</u>	<u>Variance Explained</u>
Secondary school levels	+	.10
Technical school levels	+	.05
<u>Background</u>		
(None)		
<u>Personality</u>		
Member of organization	-	.13
Influence of siblings on student	-	.08

Source: Appendix tables D.3 and D.4.

School Characteristics. The results show that the years the subject had spent in secondary school provided a partial explanation of why some students learned more French than others. Since few families speak French at home, school is the main place for learning it. Consistent with this finding are the data on the technical school. Since it teaches less French than the secondary school, the technical school's effect on French achievement is less strong.

Student Characteristics. The subjects had the opportunity to join eight different social organizations. These included the scouts, the sport teams, the music group, and the local cell of the political party. The results indicate that the less time that the subjects spent participating in these activities, the better they did on the French achievement tests. (One can imagine some of the teachers saying, "I told you so," upon reading this.)

This finding is particularly ironic given the government policy. The boys who do well in French, a major key to the doors of higher education, prestige, and political responsibility, are the ones who have not participated in those organizations that the government and the party have maintained are so important for the formation of its youth. Furthermore, we find that it

is the boys who do not like their schoolmates and do not participate who tend to do well on the French achievement tests. 6/ Perhaps schoolmates are avoided because they would be a bad influence on the achievers. 7/

Boys who move up the ranks of the party organizations may gain prestige, but without French the higher positions are closed to them. Is the school system producing leaders culturally alienated from their peers? Data presented in chapter 6 suggest that this is a strong possibility. 8/

A second significant variable in determining achievement was the student's relationship with his siblings. Eleven percent of the sample indicated that their siblings had an important interest in them, to the extent of influencing them. For the rest of the sample, 50 percent replied that they were influenced by their fathers, and 39 by their teachers, all of whom are male. The results indicate that boys with higher achievement scores said they were not influenced by their siblings, while boys with low achievement scores said they were influenced by their siblings. Father's influence and teacher's influence were not significant in explaining the achievement scores. These results are important. We would expect, even in a changing society, that fathers and teachers would serve as mentors in an authoritarian and male-oriented society. In fact, we find that the boys who do well in French are independent of these traditional sources of influence. This behavior is very different, as we will indicate in the next section, from the behavior of the boys who do well in Arabic and might be termed socially isolated behavior. This is consistent with the absence of background determinants in predicting French achievement. Thus the boys who do well in French are somewhat alienated from their families and peers.

These findings suggest a process that could be characterized as the socialization to future role models. If we assume that the best rural French achievers eventually join the urban elite, then we would hypothesize that some of the snobbism of the urban elite toward the rural folk has in fact one of its roots in the feelings of village boys. One may go further and hypothesize that, the new "moderns," or newly urbanized rural emigrants, could lack confidence in their new values and assert themselves by dominating those people who still have the "old" values. The hypothesis would be that the urban elite with rural backgrounds may have retained little empathy for rural folk and thus often make policy choices unfavorable to rural people. Since an important percentage of leaders in developing countries have rural backgrounds, this may have significant implications. Hopefully, however, on more rigorous examination, this hypothesis will be found spurious. 9/

Arabic Achievement

The Arabic results show two major and striking differences when compared with the French. First, the years of secondary or technical schooling are not significant in explaining Arabic scores, while they were for French. In other words, an extra year of secondary schooling for the sample will not significantly improve the Arabic score. Second, for Arabic

achievement the background factor is significant, whereas it was not for French scores. Personality is also important. The significant determinants are listed in table 4.4.

TABLE 4.4
Determinants of Arabic Achievement
for Rural Students

<u>School</u>	<u>Direction</u>	<u>Variance Explained</u>
(None)		.00
<u>Background</u>		
Urban visits of mother	+	.13
Place of birth	+	.08
<u>Personality</u>		
Read in free time	+	.08
Student failure due to family problems	+	.04
Noise a problem in homework	+	.12

Source: Appendix tables D.5 and D.6.

School Characteristics. First we should note that school, or "standard," Arabic should be distinguished from street, or dialectical, Arabic. The tests were written in a simplified form used in the newspapers. Colloquial speech often shortens both the classical language and the newspaper form, as well as sometimes using different vocabulary. A crude analogy might be the comparison of pidgin with the Queen's English.

The results indicate that none of the schooling variables was significant in predicting Arabic achievement, a surprising finding. Why are years of schooling not significant? First, the boys enter primary school with a knowledge of Arabic vocabulary; they do not have this with French, which is not spoken at home. Thus the marginal increments of Arabic vocabulary and comprehension with each additional year of schooling would probably tend to be smaller than the marginal increments for French. One additional year of school would mean relatively more French learned than Arabic.

A second possible reason why less Arabic is learned per year is that school success depends more heavily on French achievement than Arabic. French, not Arabic, is employed at the secondary level. Further education and more prestigious jobs depend more on French ability than Arabic. A third possibility is that students in the sample, who had an average of about two years of secondary, may have learned most of their Arabic by the end of primary school.

Background Characteristics. The more urban visits the mother made, the higher the Arabic score. Those boys who had been born in urban areas tended to get higher scores than those who had not. The mother's visits to the city are significant, and not those of the father, perhaps because of the relatively minor role the average father has in raising his children, and the mother's desire for the son's success.^{10/}

Personality. Boys who complained of noise during their homework tended to be higher Arabic achievers. The sources of noise were probably people rather than machines, and the verbal distractions could have come from both family members and the radio. As in the classroom, children chant their lessons at home. Concerned parents encourage the cacophony. Children are graded on recitation. Memorization, the basis for rote learning, often takes place out loud. We would speculate that the high Arabic score is due in part to a high frequency of verbal exposure for those who were positive toward the values associated with Arabic culture that were implied. While quality of the exposure would affect the verbal transfer, this was not measured. Thus, what the boys perceived as a distraction affecting their concentration on their homework may have directly facilitated their high score.

The more the boys read in their free time, regardless of what language it was in, the higher they tended to score on the Arabic test. This finding may point as much to the motivation for reading as to the actual practice of it.

Students who perceived that failure in school, theirs or someone else's, was due to family problems, tended to achieve higher Arabic scores. A reason for this result is not immediately obvious, but it may be a measure of understanding or sensitivity.

In conclusion, Arabic achievement is determined predominantly by personality variables rather than by the amount of schooling. While we can only speculate as to the significance of the personality variables, being motivated to read in one's spare time plus an interpersonal understanding may be important. In other studies on Arabic and arithmetic achievement, both factors have been important (Alexander and Simmons, 1974, table 2).

Arithmetic

The determinants of arithmetic achievement are similar to the Arabic but not the French results. While the school variables were not

significant, the personality and background characteristics were strong determinants, as shown in table 4.5.

TABLE 4.5
Determinants of Arithmetic Achievement
for Rural Students

<u>School</u>	<u>Direction</u>	<u>Variance Explained</u>
(None)		.00
<u>Background</u>		
Father reads books, magazines	+	.08
<u>Personality</u>		
Remembers the author	+	.08
Improve school by better facilities	+	.14

Source: See appendix tables D.7 and D.8.

Schooling. While the results are consistent with the Arabic findings, it is surprising that more years of schooling are not associated with higher arithmetic scores. Unlike French, however, arithmetic is used extensively in the rural homes, thus providing the opportunity to learn it outside the school. Boys who have odd jobs with shopkeepers or helping their fathers keep their accounts have incentives to learn that others might not have. All these reasons could contribute to why the amount of schooling does not seem to affect their arithmetic scores.

Background. The more their fathers read books and magazines, the higher the boys' scores will be. This could well be a proxy variable for the father's own interest in learning and keeping informed and his encouragement of his son to do the same. Note that it is not the amount of education the father has had, nor whether or not he reads newspapers which contribute to achievements.

Personality. Those boys who could remember the name of the author of the last book they read and who felt that school would be improved by new facilities tended to get high scores on the arithmetic test. While it is difficult to determine what these variables are measuring, the first could include the individuals memory ability.

The Urban Student

La Goulette, the port area of Tunis, is a low-and middle-income suburb. Parents in the community held both white- and blue-collar jobs, and unemployment was not so high as in the low-income migrant communities, which form other suburbs. Primary and secondary education have long been available to the population, since La Goulette was an established community rather than a new suburb. Table 4.3 above indicated that while the urban sample had about the same distribution of students by level of education as rural - e.g., 56 percent in secondary - the urban sample had about 8.6 grades of school, almost one full grade more than the rural.

The level of literacy of the urban students was higher than the rural. We saw in table 4.2 that 62 percent were literate in Arabic and 68 in French.

Using a stratified sampling technique, similar to that used in Tadjerouine and based on aerial photographs, we selected families by the type of housing and the presence of boys aged 15 - 25. This assured that we had sufficient numbers of students with parents in the low and middle income categories. The sample contained eighty-eight boys including some who were brothers. The boys and their fathers, or heads of household were interviewed separately. (See appendix table 4.9 for the statistics.)

French Achievement

Schooling. The list of determinants of French achievement in table 4.6 suggests that the use of French is more important than the number of years French was studied in school. In contrast to youth in the village, urban students have significant opportunities - at the movies, with newspapers and comic books, and in conversation - to use their French. Thus a student could have had four years of secondary school French and score below a student with two years of French and extensive use of the language. Use of French at home is probably a major aspect. We are surprised that the use is a more powerful predictor of French achievement than actual school attendance, but this is consistent with what we know about the importance of language use in gaining proficiency.

Background. Again we find that the non-school factors are more important than the school factors. From table 4.6 we see that two dimensions are directly related to material wealth: per capita income and persons/room. The higher the family per capita income, and the more persons/room, the higher the score. The higher income is probably a proxy for a family that has multiple wage earners who know the importance of French for job promotions.^{11/} Yet, they are not sufficiently affluent to afford a larger house which would lower the persons/room ratio.

Fathers' behavior was also an important determinant. Fathers who read more magazines and books had sons who scored higher. Reading newspapers was not important. Surprisingly, the more fathers tended to listen to the radio, the lower their sons scored; the less they listened, the higher the boys scored. We can only speculate as to the significance of this dimension. It could be that the radio distracted the son in his homework, or that the father tended to listen to Arabic programs, thereby frustrating a son who would have preferred the French program. Regardless of how these determinants can be interpreted, it is clear that background characteristics are more significant than schooling in predicting urban achievement in French.

Personality. The more that lighting was a problem when the student tried to do his homework, the lower was his French score. The variable would reflect both bad studying conditions and the low-income situation of the family.

TABLE 4.6
Determinants of French Achievement
for Urban Students

<u>School</u>	<u>Direction</u>	<u>Variance Explained</u>
Uses French	+	.04
<u>Background</u>		
Father listens to radio	-	.06
Father reads books and magazines	+	.06
Per capita family income	+	.05
Persons/room at home	+	.05
<u>Personality</u>		
Lighting for homework a problem	-	.07

Source: Appendix tables D.10 and D.11.

Arabic Achievement

Schooling. We now turn to making similar estimations, in table 4.7, about the impact of urban schooling on achievement in Arabic. Both primary and secondary attendances are significant, but even when combined, they are weaker than the strongest background dimension. An additional year of either primary or secondary was associated with higher scores. An additional year of technical school, kuttab, or other school characteristic was not significant.^{12/}

Background. Two of the background dimensions were significant: mothers' education and per capita income for the family. We can offer little insight as to why students with better educated mothers tended to do poorly in Arabic. Most mothers education was limited to several years of primary.

Family per capita income is a predictor of Arabic achievement. Mean per capita income was 6 dinars 887 millimes (13 U.S. dollars). A 500 millime (about \$1) increase in per capita income was shown to bring a 10 percent increase in the test score for the students near the mean score. Higher income can provide such essential school materials as pencils, paper, and books. It may also suggest a higher level of parental motivation concerning the importance of education. None of the personality dimensions was significant.

TABLE 4.7

Determinants of Arabic Achievement
for Urban Students

<u>School</u>	<u>Direction</u>	<u>Variance Explained</u>
Primary level	+	.04
Secondary level	+	.05
<u>Background</u>		
Mothers' education	-	.14
Per capita income	+	.03
<u>Personality</u>		
(None)		.00

Source: Appendix tables D.12 and D.13.

Arithmetic Achievement

Schooling. The impact of schooling on arithmetic achievement is given in table 4.8. The results are quite remarkable, indicating no significant relationship between different grades of schooling and arithmetic achievement. If students had tended to repeat grades, they did poorly on the test. Repeating grades could be a proxy for low math ability. Analysis of only the students who were in primary suggests that the younger the boys are when they start primary, the better they do in arithmetic. Age at entry, however, may be a proxy for parent motivation for the son's education, or for other background factors, and thus should be interpreted with caution.13/

The fundamental finding is that an additional year of primary schooling between fourth and sixth grade does not significantly boost arithmetic achievement. 14/ The boys who repeat grades do less well than those who do not repeat. Was the arithmetic knowledge that the boys had acquired all learned in grades one through four? Is the switch to teaching arithmetic in French in the fourth grade ineffective? 15/

Background. When their fathers spent a lot of time listening to the radio, the boys tended to get lower scores on the arithmetic tests. This is consistent with the finding for French achievement test scores.

Personality. Four variables are significant in predicting high arithmetic scores. They were a high level of modernity, whether he thought that schools could improve their results by making special efforts with the low-income students and if he wanted a humanitarian job. The less members of the family who prayed, the higher his score. Again we can only speculate on how to interpret these findings, but they do suggest the importance of non-school factors in determining school achievement.

TABLE 4.8

Determinants of Arithmetic Achievement
for Urban Students

<u>School</u>	<u>Direction</u>	<u>Variance Explained</u>
Grades repeated	-	.04
<u>Background</u>		
Father listens to radio	-	.03
<u>Personality</u>		
Level of overall modernity	+	.02
Schools could improve by helping the poor	+	.07
Desires humanitarian job	+	.03
Someone in family prays	-	.02

Source: See appendix tables D.14 and D.15.

Conclusions and Implications

Based on the data of the two communities, four main points emerge:

1. We had expected that the level of newspaper reading comprehension would have been higher for students with four to nine years of schooling. In Arabic only 57 percent of the rural sample, and 62 percent of the urban, could reach that level. The remainder were semiliterate or illiterate. In French only 38 percent of the rural had newspaper-level reading comprehension, while 68 percent of the urban did (table 3.1).
2. We had expected that the more grades of school a child passed, the better he would score on our tests of cognitive achievement. This should be particularly strong in a school system in which advancement is based on ability and is not automatic. In only three of the six schooling opportunities, however, did amount of schooling prove to be significant (table 4.9). (The dimensions of schooling include either primary and secondary but not necessarily both.) In only one of the six was technical school or grades repeated a significant determinant of cognitive ability. Neither kuttab attendance, nor tutoring, nor age at entry was significant.
3. The background of the student was significant in five of the six schooling opportunities. In the combined score the background factor explained more than twice as much unique variance as did the schooling factor.
4. The personality of the student was significant in five of the six opportunities for predicting cognitive achievement. It explained almost three times as much unique variance as the schooling factor.

Table 4.9

Summary of the Determinants of School Achievement
Percentage of Variance Explained

	French		Arabic		Arithmetic		Rural	Average	
	Rural	Urban	Rural	Urban	Rural	Urban		Urban	Combined
	1	2	3	4	5	6	7	8	9
School	.15	.05	.00	.09	.00	.04 ^a	.05	.06	.05
Background	.00	.22	.07	.20	.08	.03	.02	.16	.09
Personality	<u>.21</u>	<u>.09</u>	<u>.39</u>	<u>.00</u>	<u>.22</u>	<u>.14</u>	<u>.30</u>	<u>.08</u>	<u>.19</u>
Total	.36	.36	.46	.29	.30	.21	.37	.30	.33

Source: Tables 4.1 - 4.8.

Notes: a Grades repeated only

These four conclusions cannot be taken out of context. They are for two communities in one developing country.

It is possible, though unlikely, that these communities, families, schools, and students are unique. In the design we traded off the ability to generalize from a larger sample with our desire to probe in depth a more limited number. Furthermore, we have not attempted to determine what school inputs were the significant ones. What is attributable to good teaching, to the availability of textbooks, or to some other input? Finally, we did not attempt to measure the physical and psychological abilities of the students when they entered school. Thus, some children scored poorly because they had poor nutrition, low stamina, brain damage, needed eyeglasses, or were dyslexic. 16/

What are the implications of these findings? Fortunately we have data from similar studies in both developed and developing countries. The studies indicate (Alexander and Simmons, 1974) that the Tunisian findings are not unusual. In fact, they share many characteristics with other studies like the low predictive power of schooling variables, and the higher power of personality and home background. Because of these similarities we venture some policy implications.

First, future studies using experimental design should be undertaken to confirm or reject these findings.

Second, experimentation should include attempts to reduce secondary school expenditure on students without loss on achievement scores.

Third, the background determinants of school achievement require intensive study and experimentation in an attempt to modify parental behavior and environment.

Fourth, until significant breakthroughs are made that would improve schoolings' contributions to achievement, alternatives to the existing types of formal education should be vigorously explored.

Footnotes for Chapter 4

1. See chapter 8 for a full discussion of this issue.
2. There are many dimensions to these categories of school outputs. The previous studies have found that the relationship between some of the output measures is weak. (See, for example, J.C. Flanagan et al., 1972, tables 2-7.)
3. Recursive estimation assumes that the causal ordering is correct. The analytic framework is simply established. Let achievement be a linear function of schooling, personality, and background or:

$$A = S_1 + S_2 \dots P_1 + P_2 \dots B_1 + B_2 \dots + u.$$

Where A is achievement, S_1 and S_2 are dimensions of schooling, P_1 , P_2 are dimensions of personality, and B_1 , B_2 are dimensions of the student's background. U represents other factors affecting income, assumed to be random and uncorrelated with S.

4. This final hypothesis needs clarification in the light of recent evidence which suggests that within a grade level the amount of schooling had little impact on achievement. Previous research (Coleman, 1966) collected data comparing the achievement scores of children in the sixth grade of primary school among different schools. Some schools had spent more hours per year teaching students than other schools had spent. This data, analyzed by Jencks (1972, p.36), indicated that exposure to different amounts of schooling had no appreciable relationship to achievement scores. This analysis included the length of the school day, number of hours per year, as well as students who were on half-day sessions. In no way contradicting this finding is the evidence that the more years of schooling that a child has, the higher will be his level of cognitive achievement. The data that we collected will be used to test this latter finding. Because the sample design limited the number of schools, we cannot test the Coleman-Jencks findings.
5. The high reliability coefficient of the one comparative measure -- the Inkeles modernity scale -- and the high R_2 in the regression comparable in other studies (Simmons, 1974) helped confirm the accuracy. Reliabilities calculated by Inkeles (1974) as part of his six-country study are lower.
6. Perhaps the boys who do not like their schoolmates participate in these non-school activities in order to find non-school friends. We find, however, that there is no significant association between

disliking schoolmates and participation in non-school activities. The correlation between dislike of schoolmates and participation in organizations is $-.208$ and insignificant at normal probability levels. Other possible explanations of the organization finding come to mind, and would have to be tested in further research. The first is that the boys who do better on the tests tend to be more inner directed and one could speculate that they are beginning to take on the values of the Frenchified elite, and thus tend to disdain even such recent and supposedly "modern" activities as the scouts as being too traditional.

7. Leaders who have hated their school-fellows, who despise all forms of community activity, and who have been thoroughly Frenchified may in fact retain the strongest sentimental attachment to the village and the old Arab ways.
8. The data can be viewed in another way. We divided the sample into those boys who belonged to organizations (n 25) and those who did not (n 19), and then asked if there might be significant differences on the 130 variables between the two groups. We found that the boys who did not belong to organizations read more in their free time, wrote more letters, and tended to be more influenced by their fathers. Note that none of these three items by itself was significant in predicting achievement. The "organization men" spent more time in the urban areas and were graded more modern on the Inkeles scale. The data provided additional insight into the relationship between organization activities and future behavior. Boys who have had more years in the organizations than their peers tend to have higher job aspirations. The jobs are in the professions, the party, and the government. If we assume that a link exists between education performance - i.e., years of schooling accomplished - which increasingly depends on French ability, and achieving high status jobs, then these boys with job aspirations who are in the organizations and doing poorly in their French will suffer greater frustrations than the boys who are not in organizations. Does this frustration reach a level to alter their behavior when they get responsibility? Because of their lack of success in learning French, and the probable second-best jobs that will result, do they develop antipathies for their peers who succeed in French, attain more schooling, and therefore get the best jobs?
9. A variant of this hypothesis had been suggested in an earlier article (Simmons, 1971) to help explain the fall from power of Ahmed Ben Salah, a Tunisian minister. Ben Salah had led development efforts for almost ten years, including a nationwide program for the state management of agricultural production and marketing. The peasants and landlords finally convinced President Bourguiba that state management was both unjust and uneconomic; Bourguiba fired Ben Salah and then tried him for treason.

10. Mother's urban visits correlate with socioeconomic characteristics (.46) and movie exposure (.40). The frequency of her visits correlates negatively with the number of people praying in the home (-.31), probably indicating that the more religious the home, the less the freedom for its women.
11. To examine more closely the impact of primary schooling on French achievement, we removed the boys from the sample who were in secondary or technical school, leaving 19 boys. Coefficients for the same independent variables shown in table 4.6, less the secondary and technical measures, were estimated, and all were found to be insignificant at normal levels of probability. Thus, reasons other than primary schooling should explain why some boys do better than others on tests of French achievement.

The same approach was used to examine the impact of technical schooling on achievement levels. The boys with secondary were removed, leaving 39 boys. In this equation none of the independent variables listed in table 4.6 was significant. Thus, while French was taught at the technical school, but not at the technical center, it did not seem to have an impact. Was the quality of instruction poor? Were the boys unmotivated since few job opportunities open to them would require French?

To aid in understanding the role of schooling in French achievement we created a new variable by combining the total levels of schooling (TLS) that the full sample (n 88) had reached. We estimated the following regression with the tests in parentheses:

$$\begin{aligned} \text{French achievement} &= f(\text{total levels of schooling}) \\ &= 3.15 + .38 \text{ TLS} \quad R_2 = .14. \end{aligned}$$

The Beta coefficient is significant, but it is identical to the Beta for the secondary in table 4.6, thus confirming the insignificant impact of all but secondary.

12. In order to examine more closely the impact of primary schooling, other variables on Arabic achievement we removed boys from the sample who were in secondary or technical leaving boys. Coefficients for the same independent variables shown in table 4.7 were estimated. No significant changes occurred. Primary was the only significant variable with an improved Beta of .58 and an R_2 of .34.

A similar approach was used to look at the impact of technical school on Arabic achievement. Boys who had secondary were removed from the sample, leaving 39 boys. As we found for French achievement, attendance at the technical school did not significantly improve Arabic achievement.

But "repeating primary grades" was significant, and its coefficient positive. This is the first and only evidence that repeating contributed positively to achievement. (It will be shown below that it is negatively related to arithmetic achievement.)

13. To examine more closely the impact of primary schooling on arithmetic achievement, we removed from the sample those boys who were in secondary or technical school, leaving 19 boys with only primary. Coefficients for the same independent variables shown in table 4.8 were estimated. A significant change occurred in the new estimation. The Beta for the variable "grades repeated" drops from $-.30$ to $-.12$. "Age when entered" primary school becomes significant as the correlation coefficient moves from $-.15$ to $-.54$, and the Beta is $-.63$ (significant at less than the .05 level), and the R_2 is .43 for the full equation.
14. A similar approach was used to examine the impact of technical schooling on arithmetic achievement. Boys with secondary were removed from the sample, leaving 39 boys. In this new equation the amount of time spent in technical schools was not related to arithmetic score. Only one of the independent variables listed in table 4.8 was significant. It is "age when entered" primary school and the coefficient is negative. The Beta is $-.41$ and the R_2 is .21 for the full equation. This suggests that for those in the technical stream the younger the student at entry, the higher his arithmetic achievement. As in the previous equation, this could be a proxy variable for background effect, such as parents' interest in education or their ability to get a school place for their child. The major finding of the equation is that an insignificant amount of arithmetic was learned at technical schools.
15. To examine further the impact of schooling we removed all but the boys who were still in primary school. This left 19 subjects. We then estimated regression of all achievement scores on the following schooling variables: kuttab attendance, level of primary reached, age at primary entry, grades repeated, and changes of school. (Only one subject was at the fourth grade; the rest were at the fifth or sixth.) The statistics are given in table D00.

TABLE D00

Statistics for Primary Only

	<u>Mean</u>	<u>St. Dev.</u>
Age on school entry	6.16	.77
Grade repeated	2.84	1.12
Changed schools	.68	.48
<u>Kuttab</u>	.59	.51
Primary school level	5.58	.61
Math score	3.58	.90

Arabic score	3.53	1.61
French score	4.26	.99
Modernity	7.00	3.18

The results of the regression suggested the minor impact of the schooling variables. In the math equation, only "age when entered school" approached significance ($P = .10$). The effects of schooling were absent for French achievement. Arabic, on the contrary, was affected at the levels of primary reached, but no other variables were significant in the equation. The R_2 in the equation, with one independent variable, was .34. We also estimated modernity, and found that only "changed schools" was a significant predictor with a positive coefficient. The R_2 for the equation with one independent variable was .26. Given the nature of the data on amount of schooling, we can only say that the additional work of the sixth grade did not significantly affect achievement scores in math or French, nor did it boost the modernity level. The additional grade did improve Arabic performance.

16. For example, some evidence (Scrimshaw and Gordon, 1968; Winich, 1969; Selowsky, 1973) suggests that an essential causal factor in school achievement is a minimum level of balance protein consumption in the first several years of life. The literature on intelligence measures (Anderson, 1942; Laviu, 1965; Sartain, 1946), although heatedly debated, provides support for a genetic dimension in achievement.

Chapter 5

Determinants of the Cognitive Achievement of Workers

INTRODUCTION

In the previous chapter we attempted to isolate factors associated with the cognitive achievement in boys who were still in school. Now we will turn to the question of what happens to a student's scholastic achievement after he has left school. Does he forget most of what he had learned, or does his experience in the world outside build on and enhance the knowledge he had attained in school? Or, as a third possibility, does his knowledge remain at the same level if was when he was a student?

We operationalized retention of knowledge acquired in school as the respondent's demonstration of his ability to solve relatively simple arithmetic problems and to read and answer questions on short passages written in literary Arabic and French, approximating newspaper-level writing. School-leavers were administered three tests - on arithmetic, Arabic, and French - as were the part of the sample still in school. (See appendix A for a description of the tests.) There were wide differences among respondents on the test scores. Results cover the full range from a perfect score on all three tests to no correct answers at all. A few did well on one but poorly on others; however, the general trend was that if a boy performed well on one test, more than likely he did well on the other two. The converse also held true. The trend toward consistency of performance evidenced by the relatively high inter-test correlations in both samples.^{1/}

Our findings have the following implications for literacy: Where a score of 5 or 6, on a six-point test, is the operational definition of full literacy (i.e., reading and understanding national newspapers), 36 percent of rural school-leavers are illiterate in Arabic and 22 percent in French. Fifty percent are semiliterate in Arabic and 56 percent in French - where semiliteracy refers to scoring 3 or 4 on the tests. The rest are, literate, as shown in table 5.1. Among urban school-leavers we find 31 percent to be fully literate in Arabic and 41 percent in French. Forty-two percent are semiliterate in Arabic, and 22 percent in French.

TABLE 5.1
Literacy^{/a} among School-Leavers
(in Percentages)

	Rural (n 36)		Urban (n 80)	
	Arabic	French	Arabic	French
Literate	13%	22%	31%	41%
Semiliterate	50	56	42	22
Illiterate	36	22	26	27

NOTE:

/a Literacy is defined in terms of scores on the achievement tests (see appendix A). Full literacy is passing 5 or more items on a six-item test, while semiliteracy is passing 3 or 4 items.

In this chapter we will explore why some school-leavers have been relatively successful in developing and retaining the literate skills they learned in school while others have not. Our task will be to isolate factors that may help in understanding the differences we observe in scholastic achievement a number of years after the respondents have left school.

Literature on the long-term effectiveness of education is scarce both for developed and developing countries. In their review of literature on early school-leaving, Beirn, Kinsey, and McGinn (1972) mention only two studies relevant to our investigation. Both of these studies underscore the importance of levels of education attained for the retention of literacy after leaving school. In one study, Gadgil (1955) investigated the durability of the results of primary education in India among ex-students who had been out of school from five to thirty years. Literacy was operationalized as the ability to read printed matter with understanding. The results showed a strong positive relationship between the level of education attained before leaving school and the retention of literacy. It was found that at least four years of primary education were necessary to assure life-long literacy; people with less education tended to lapse into illiteracy. The second study, this one by Schuman, Inkeles, and Smith (1967) in East Pakistan, also points out the strong relationship between years of education and literacy, where the latter was operationalized as reading a short newspaper-level passage. Correlations with level of education and literacy score were as high as .82 in their rural sample and .85 in their factory sample. (For further discussion of this literature see chapter 7.)

Educational Attainment

To explain differences in post-school test performance, we will look first at the amount of education a boy has had before leaving school, as this factor has been reported in the literature to be a most important determinant of achievement levels. In general, we expect that the more education a worker has had, the better will be his chances of scoring high on the tests.

The educational background of the sample is given in table 5.2. Among the rural boys, 33.3 percent has less than a primary school education, 33.3 percent completed primary school but did not go on beyond that. Among the urban boys, 31.8 percent had less than primary education, and 19.4 percent completed primary school. The urban sample is somewhat better educated, mainly because of easier access to secondary schools. Yet in neither group do we find a substantial percentage of secondary school attendance. The mean grade of schooling for the rural sample is 6.3, and for the urban 6.7

TABLE 5.2

Educational Background of Rural
and Urban School-Leavers
(in Percentages)

	<u>Rural</u>	<u>Urban</u>
Less than primary	33.3%	31.8%
Completed primary only	33.3%	19.4%
Attended technical school /a	25.0%	29.5%
Attended secondary school	8.5%	19.3%

NOTE:

/a Technical school refers to both college moyen and Centre de Preapprentissage.

Given this range in the educational background of our respondents, we do find a positive relationship between the years of education one has attained and his cognitive achievement after leaving school. For the rural sample there is an average correlation of .476 among the test scores and the total levels of schooling, while for the urban sample there is a correlation of .496. Individual correlations are in the .400 to .600 range with two exceptions: in the rural sample, total levels of schooling correlate .315 with arithmetic achievement and .636 with French. We might infer from these two deviations that the school is not the only place one can learn and practice

one's math, hence the low correlation with schooling; on the other hand, it is very much the only place to learn French in a rural community, hence the high correlation.

The striking aspect of these results is not that doing well on the tests is related to the level of education one has attained before leaving school. On the contrary, it is that the relationship is not even stronger. We found that, on the average, total levels of schooling one has had explain about 25 percent of the variance among test scores. Schuman, Inkeles, and Smith (1967), on the other hand, found a much higher relationship, with education explaining up to 75 percent of the variance in literacy.

Determinants of Post-School Achievement

The amount of education a respondent has had certainly influences his post-school cognitive achievement, on the average it can explain roughly a quarter of the variance in test scores. While this is impressive for a single variable, we must look into other possible sources of influence to explain the other three-quarters of the variance. One logically obvious factor affecting post-school test performance is the number of years the respondent has been out of school. If with each year of being out of school a person forgets more of what he had learned as a student, we would expect a negative correlation between test scores and the number of years elapsed since he left school. If with each year's experience in the world at large a person adds to his store of knowledge, we would get a positive correlation. It turns out, however, that there is no relationship between test scores and the number of years respondents have been out of school (see figures 5.1 and 5.2). We hypothesized that the observed lack of a relationship may be due to one of four reasons. (1) A person retains almost all of what he has learned in school regardless of when he quit, so that the number of years he has been out has no influence on his test performance - the perfect retention hypothesis. (2) The relationship between years out of school and test performance may change with each consecutive year. In other words, the relationship may be non-linear, giving rise to low correlation coefficients because the correlation technique can only reflect a linear associational pattern - the non-linearity hypothesis. (3) The passage of time since leaving school may have a different effect on boys with different levels of education. There may be an interaction between years out of school and level of education attained to produce the observed test results - the interaction hypothesis. (4) Low correlations may be due to the possibility that some retain school learning through time, and others learn more later on in life. The net effect of these different patterns would be to cancel each other out, so that there would be no relationship between years out of school and test performance. These different patterns are probably a function of what a boy does in the intervening years between leaving school and being tested - the intervening activities hypothesis.

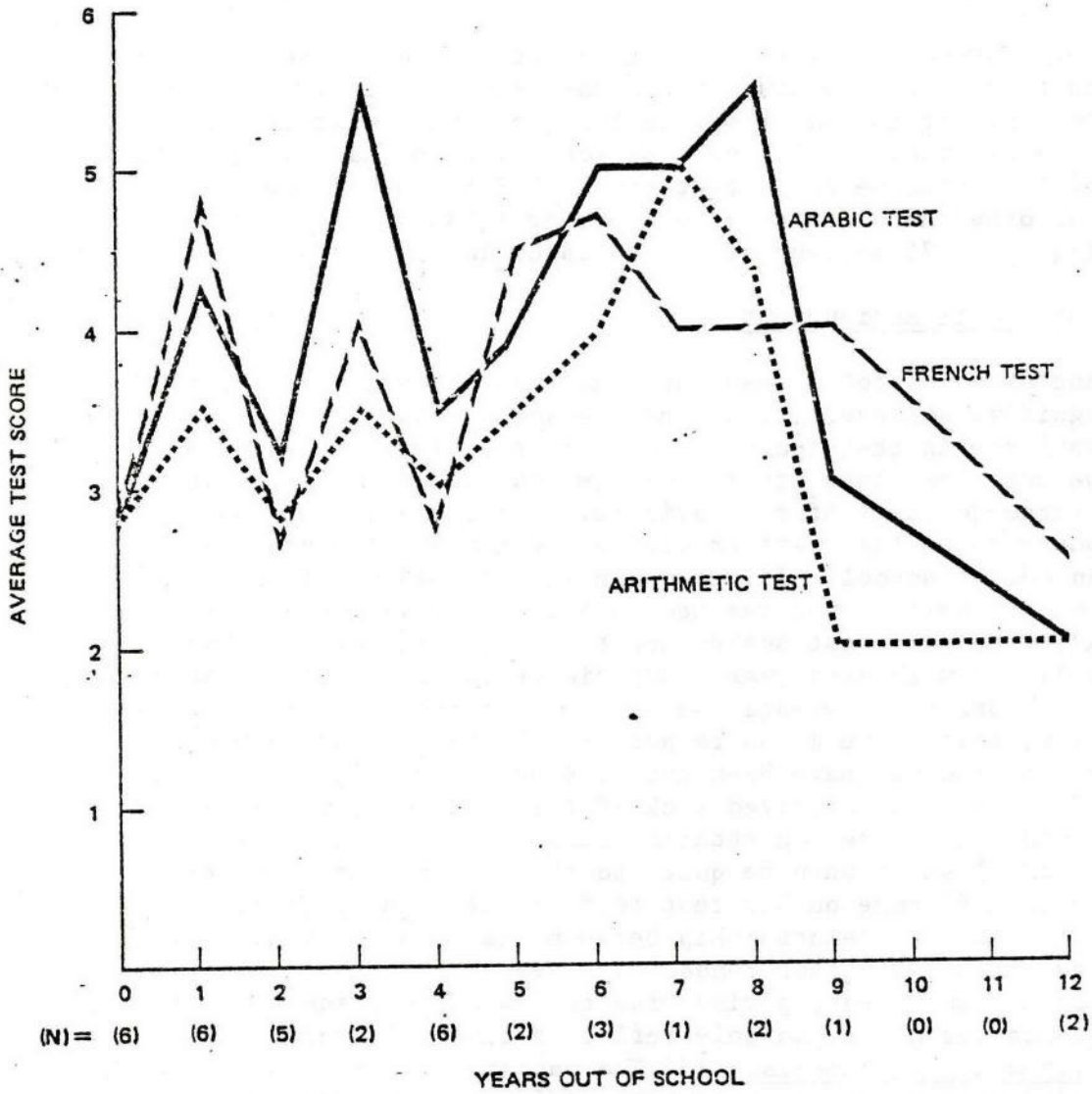


Figure 5.1: Retention of Literacy Over Time: Average Test Scores of RURAL School-Leavers by the Number of Years they have been Out of School.

Carbon

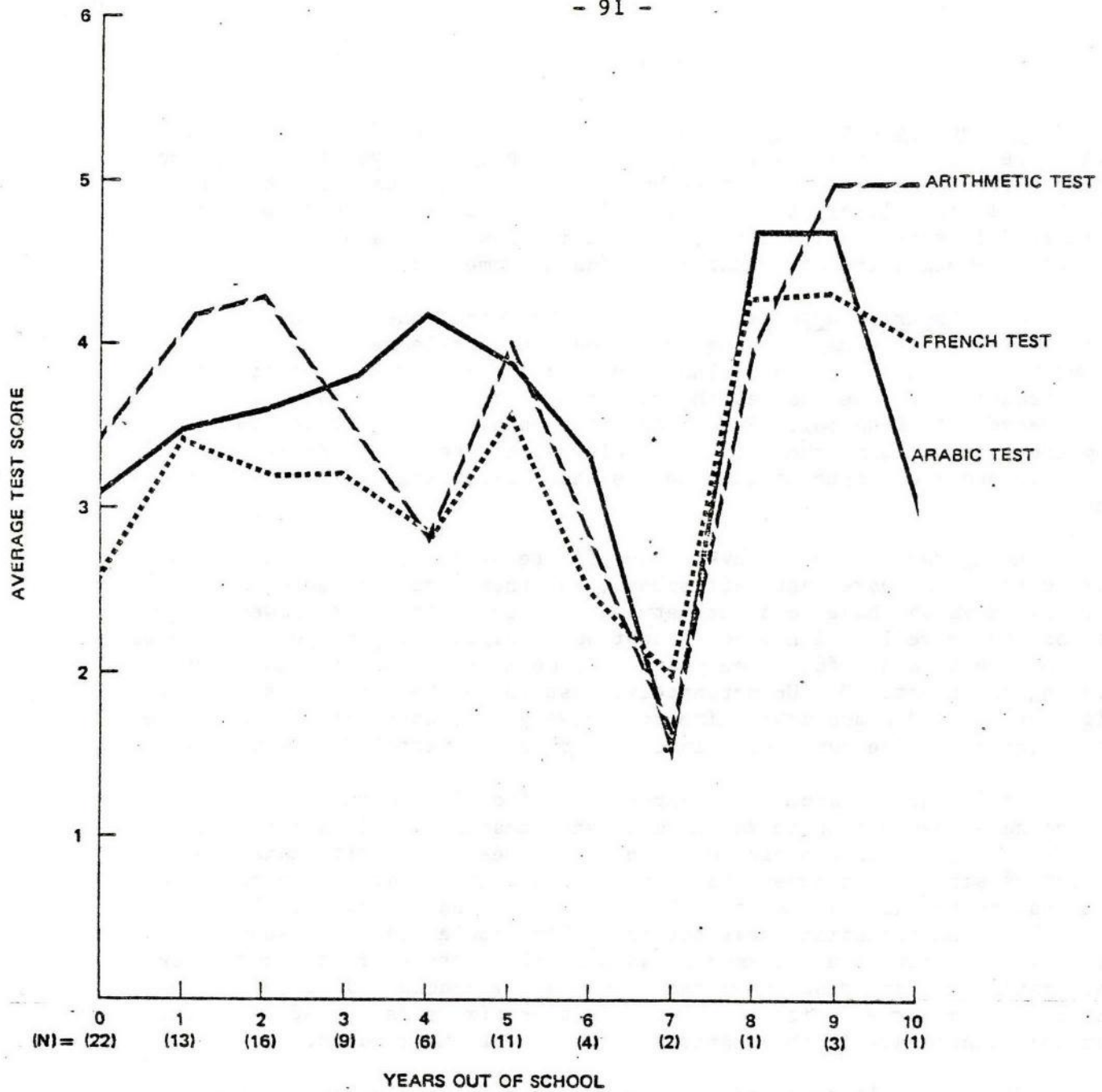


Figure 5.2: Retention Literacy Over Time: Average Test Scores of URBAN School-Leavers by the Number of Years they have been Out of School.

1. Perfect retention hypothesis. Of the four possible reasons stated above for the observed lack of correlation between years out of school and text performance, the perfect retention hypothesis does not seem very plausible. It is unlikely that people will retain intact most of what they have learned in school. Therefore, we will dismiss it on a priori grounds and go on to explore the other three reasons in some detail.

2. Non-linearity hypothesis. It is likely that one will not acquire or forget, as the case may be, the same amount of knowledge with each consecutive year out of school. The loss or gain in knowledge is likely to differ through time. We checked this hypothesis by plotting test scores against years out of school. Even though the results of all tests seem to follow the same pattern, there is no simple relationship between respondent's test scores and the length of time he has been out of school (see figures 5.1 and 5.2).

Among rural school-leavers (see figure 5.1), the lowest test scores are among those who have just left school, and those who have been out for a long time. Boys who have been out between five to eight years, however, tend to perform quite well. With minor exceptions - e.g., the high performance of those who have been out for three years - we observe a retention curve roughly resembling an inverted U. Unfortunately, just where the curve goes up, five to eight years, and comes down, nine to twelve years, there are too few cases of observation to give confidence in this particular pattern of results.

In the urban sample the scores are uniformly moderate to low for those who have been out up to seven years when measured in 1968 (see figure 5.2), indicating no discernible relationship between test performance and years out of school. At seven years there is a dramatic drop in performance - then just as dramatic a rise for those who have been out for eight to ten years. Thus, the retention curve for the urban sample roughly resembles a U. Again, however, there are not enough cases in the years where the curve makes an interesting dip and rise to warrant drawing any conclusions from the shape of the retention curve. With so few cases after six years out of school, we cannot have confidence in the representativeness of the results.

Therefore, it seems that for both the rural and urban samples, the data at hand only lend themselves to the conclusion that there is no relationship between test scores and years out of school - certainly no linear relationship, and no non-linear relationship that we can place confidence in.

3. Interaction hypothesis. The amount of learning or forgetting with each year out of school may differ with the level of education attained before leaving school. It may be that one will forget less through time when one's knowledge has been well entrenched by prolonged education. On the other hand, it is also possible that people with less than a primary school education may learn a great deal with each year out of school since they knew so little

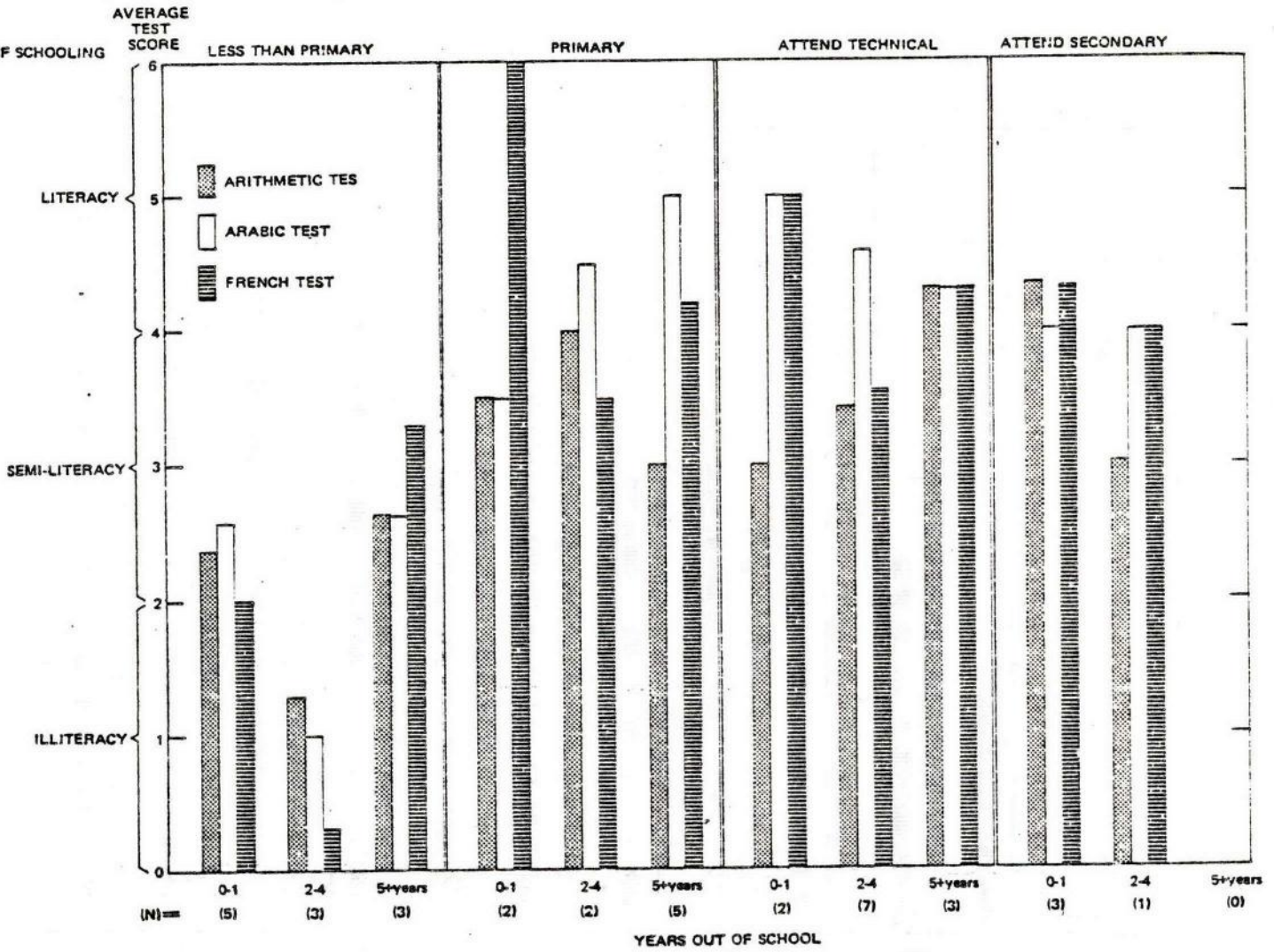


Figure 5.3: Average Test Scores of RURAL School-Leavers: Years Out of School by Levels of Schooling

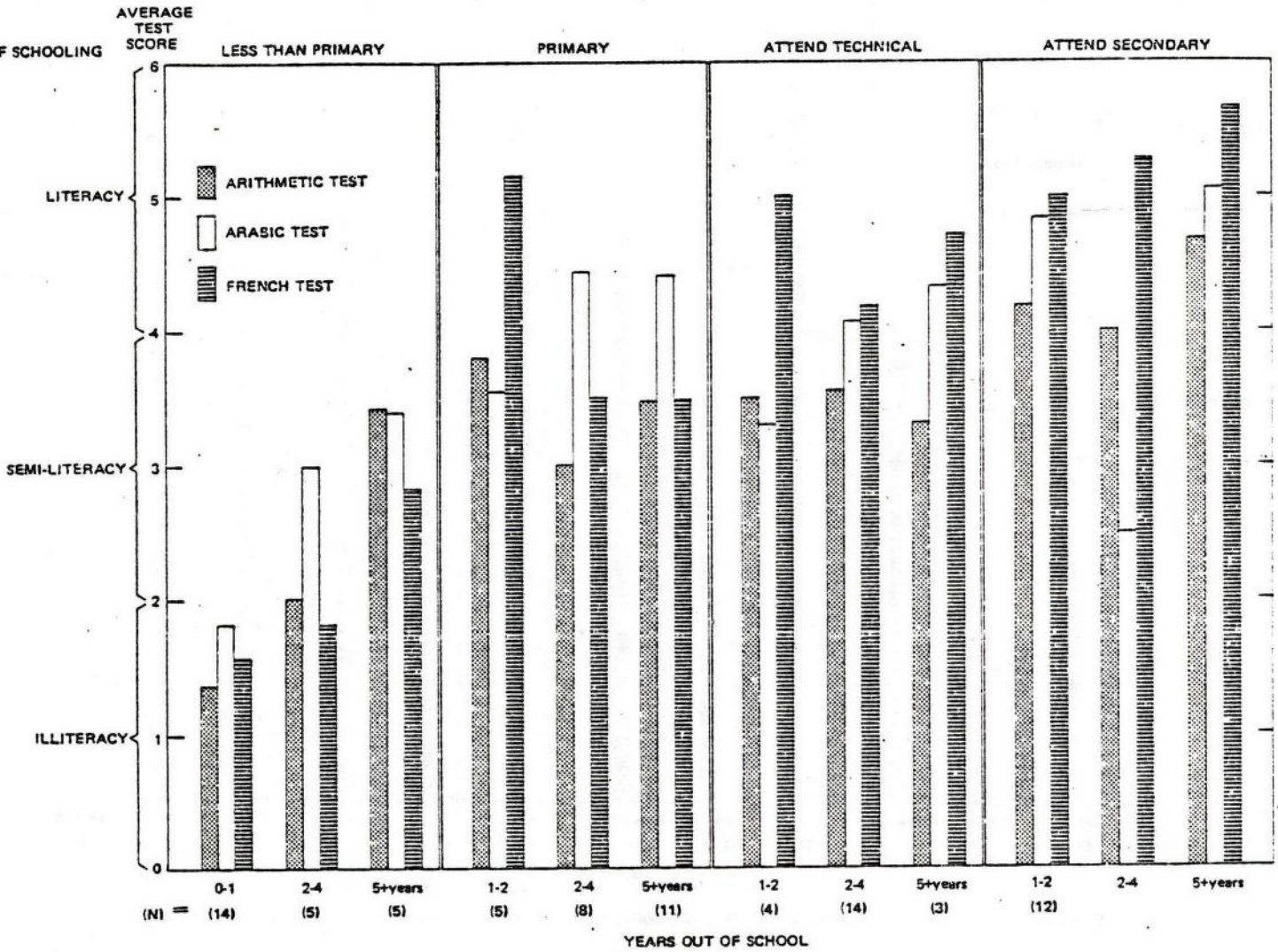


Figure 5.4: Average Test Scores of URBAN School-Leavers: Years Out of School by Levels of Schooling

to begin with. We checked the interaction hypothesis by examining average test scores as a function of both years out of school and levels of schooling (see figures 5.3 and 5.4).

The major finding concerning rural school-leavers is that having less than a primary school education is not enough to score well on the tests. These boys are illiterate or, at best, semiliterate. The number of years they have been out of school does not seem to make a predictable score difference. Among those who have completed primary school or more, we observed scores indicating semiliteracy or full literacy, but again the number of years one has been out of school does not make a consistent difference.

In the urban sample, one interaction effect seems to emerge. Among those with less than primary school education, the ones who have been out for five or more years do considerably better than those who have been out for shorter periods. That is, primary school dropouts of recent years are by and large illiterate, whereas those who left five years ago are semiliterate. It may be that the quality of instruction was better and/or schools were more selective in admitting students prior to 1963, five years before the survey was conducted. Among the boys who have had a primary education or more, the number of years they have been out of school does not seem to have an effect. The difference in test scores mostly reflects the amount of education one has had (see figure 5.4).

With the single exception of the case where urban primary dropouts who left school five or more years ago do better than those who left more recently, there is no evidence to substantiate a full-fledged interaction hypothesis. In general, for both rural and urban school-leavers, there does not seem to be a greater likelihood that those who have less education forget the skills our tests measure sooner or that those with more education will be affected less by the erosion of time. So far we have established only that schooling affects test performance regardless of number of years one has been out of school.

4. Intervening activities hypothesis. We shall now turn to the final reason put forward as a possible explanation for the observed lack of relationship between the number of years a respondent has been out of school and his achievement level. It seems likely that what a boy has busied himself with between the time he left school and the time that he was tested will be a potent predictor of his post-school performance. His job is the single most important activity he may have engaged in. Sixty-one percent of our out-of-school rural sample had been employed and 44 percent of the out-of-school urban. The occupations ranged from apprenticeships to middle-level officialdom. We found the relationship between the type of job held (ranked according to prestige) and post-school test performance to be quite low, however. The average correlation between occupational prestige and performance on the test was .135 for the rural sample and .152 for urban. Yet it may be that some aspect of a person's job other than its prestige may be the crucial factor. One very relevant aspect of occupation is whether or not it requires reading and writing.

We would expect that practicing his literate skills on the job might help a worker retain what he had learned in school or even add to it. We do in fact find a slightly stronger relationship between test performance and using reading and writing on the job than with occupational prestige. Yet, overall, using literate skills on the job does not have an appreciable effect on post-school test performance; the average correlation with test scores is only .200 for the rural sample and .266 for the urban.

A SYSTEMATIC ANALYSIS OF POST-SCHOOL ACHIEVEMENT

So far we have focused mainly on education to explain differences in test scores. Yet it is likely that a person's scholastic achievement will reflect the influence of his family background, his job experience, his personality, as well as the amount and type of education he has had. In this section, we will systematically explore the impact of four different factors on performance on each of the achievement tests. These are: (1) the background factor, covering data on respondents' parents, family characteristics, socioeconomic status, as well as demographic characteristics; (2) the schooling factor, which includes information on each type of school our respondents have attended, length of attendance, and whether or not they had special tutoring; (3) the job factor, which covers employment history; and (4) the behavioral-attitudinal factor, covering behavior patterns, attitudes, perceptions of the past, aspirations, and plans for the future. 2/

The analysis based on the impact of each factor necessarily provides an incomplete picture because in reality all factors interact in a complex way and produce a joint effect on post-school achievement. We will remedy this shortcoming by also reporting the results obtained when all factors are taken into consideration jointly. There is considerable merit, however, in isolating the individual effects of each factor, not only as a theoretical point of interest but also for practical reasons. Information on the separate effects of each factor is a source of information for a possible social intervention project, as different factors have different degrees of malleability. For example, while it is difficult for an intervention project to affect changes in the family background, it is relatively easier to manipulate schooling or employment, if the latter are found to have a large impact on long-term retention of school learning. Therefore, we deem it important to begin our systematic analysis by first focusing on the individual contribution of each factor alone, and then supplement this by an analysis of the joint effects of all four factors.

Needless to add, these four factors do not exhaust the possible sources of influence on post-school achievement. Yet we feel that in this pilot study we have gone a long way in covering many sources of influence, especially along the behavioral-attitudinal dimension. It is our hope that the present study can contribute, if in a small way, to filling the gap in studies in post-school achievement in the third world.

Predicting Rural Performance on the French Test

Background Factor. For the rural sample the single most powerful background variable is whether the respondent's father listens to the radio. Also of importance is having an educated person help with his homework. Together these two variables account for 34 percent of the differences in French scores. No other background variable seems to make a significant contribution to our understanding of the French achievement of rural school-leavers. 3/ If a boy does well in French after leaving school because his father listens to the radio and because he had high quality help with his homework, this indicates that within a low-income community a certain "intellectual" atmosphere in the home - albeit in a rural sense - is more important for French achievement than is socioeconomic status, which did not emerge as a significant variable.

Schooling Factor. Among schooling variables, completing primary school turns out to be the only significant source of influence on doing well on the French test. By itself, it accounts for 34.2 percent of the variance in French scores. 4/ In a rural setting where most people do not have a chance to polish up their French by attending secondary school, primary school seems to be the only source of influence separating those who are better in French from those who are not.

Job factor. It comes as no surprise that there are no job-related variables that have a significant impact on the French achievement of rural boys. Work in a village setting does not seem to improve one's foreign language skills.

Behavioral-Attitudinal Factor. Having modern attitudes is the best predictor of French achievement among personal characteristics. In the context of this study, modernity refers to a composite of attitudes which include: an openness to change; emphasis on achievement over ascription; placing a high value on rationality, efficiency, egalitarianism, and mobility; and, most important for the purposes of predicting scholastic achievement, placing a high value on education. In addition to valuing education, it would seem that the openness to change aspect of modernity may have a bearing on French achievement to the extent that a modern person would welcome the opportunity to learn a foreign language. Other predictors of doing well in French are an egalitarian attitude toward the role of women, attending movies frequently, not relying on friends as a source of news, considering a person outside the family, possibly a teacher, as a source of influence, and - somewhat ironically - thinking that a high level of education is not necessary to obtain a suitable job. Together these six behavioral-attitudinal variables explain as much as 73.1 percent of the variance in the French achievement scores. 5/

The results suggest that the village boy who does well in French after leaving school is one who in his life style has turned his back on rural traditions, much as the high French achiever in school was shown to do (chapter 4).

The rural boy holds modern attitudes not only regarding his personal sphere but toward the role of women as well. He has gotten away from the influence of family, claiming that the person who had a real influence on him was a non-relative. He has rejected a traditional focus of social interaction among peers, that of exchanging news items in the local coffeehouse. 6/ The only aspect of his attitude that does not seem to fit the picture upon first inspection is his saying that a high level of education is not necessary for a suitable job. While such a response could indicate placing a low value on education, it might also be a realistic attitude that in rural Tunisia high levels of education do not guarantee a "suitable" job. In our rural sample, we found that the best-educated respondents (those who attended secondary school) were no more likely to have prestigious jobs than anybody else - we inferred that the word "suitable" in the original question implied a secure and well-paying job. 7/ Thus, saying that secondary or higher education is not necessary for getting a suitable job probably indicates a realistic outlook rather than a low value placed on education.

Summary of Analyses Based on Separate Factors. The results of the foregoing analysis of the individual effects of each factor on French achievement have been summarized in table 5.3. While the job factor makes no significant contribution, the behavioral-attitudinal factor has a very large impact. An outward orientation, away from traditional rural life characterizes the behaviors and attitudes of school-leavers who excel in French. From a consideration of the behavioral-attitudinal variables alone, it becomes evident that if the respondents became more modern, they would do better in French.

Modernity, however, is an elusive concept, not easily propagated by direct tuition. On the other hand, the education factor provides a variable that may be more successfully manipulated. For the purposes of long-term retention, investing in primary education for everyone would seem to pay off more than investing in secondary education for a few because completing primary school turns out to be one of the best single predictors of French achievement. Also, that the rate of listening would go up, making radios more readily available, could improve French retention. This latter may turn out to be the most efficient way of insuring greater retention of school learning.

Taking All Factors Simultaneously. When all factors are analyzed together, the conclusions reached in the preceding section are not substantially altered; however, we do gain added insight into how the different predictor variables interact to produce a combined effect. Our basic conclusions regarding the rural French achiever are that he is a primary school graduate with modern attitudes, especially regarding women's role in society, that his father listens to the radio regularly, and that he does not rely on his friends to get news of current events. 8/ An examination of table 5.3 reveals how the different variables interact in predicting French achievement. Under the schooling factor, "primary school-levels" account for 37 percent of the variance in French scores, and "overall modernity" accounts for 30 percent under the behavioral-attitudinal factor. When all factors are combined we observe a drastic drop in the unique

Table 5.3

Determinants for French Achievement
Among Rural School-Leavers

<u>Background factor</u>	<u>Direction</u>	<u>Variance</u>
28 Father listens to radio	+	.19
78 Helper's education	+	.14
<u>Schooling factor</u>		
54 Primary school levels	+	.37
<u>Job factor</u>		
(none)		
<u>Behavioral-Attitudinal factor</u>		
133 Overall modernity	+	.30
128 Role of women	+	.16
110 Frequency of movie attendance	+	.11
118 Get news from friends	-	.10
69 Teacher, non-relative influential	+	.09
91 Minimum education necessary for suitable job	-	.06
<u>All factors combined</u>		
54 Primary school levels	+	.09
133 Overall modernity	+	.08
128 Role of women	+	.15
28 Father Listens to radio	+	.08
118 Get news from friends	-	.04

Source tables E.1-E.4 in Appendix E.

contributions of these two variables. This points out that finishing primary school and espousing modern attitudes essentially have similar effects on post-school performances; they are almost substitutes for one another. The same can be said about the effect of "father listens to radio" and "gets news from friends." There seems to be some commonly shared predictive power in these four variables. While each one makes a small unique contribution to explaining the total variance, most of their predictive power comes from one underlying dimension all the variables seem to be tapping. One way to characterize this common underlying trait would be to call it "inner-directed enlightenment" - the "enlightenment" aspect being the combined effect of modern attitudes, primary education, and father's media exposure, and the "inner-directed" aspect being the boys' not relying on friends as a source of news.

Egalitarian attitudes toward women's role seems to make a unique contribution somewhat separate from the joint effect of these other variables. Apparently enlightened, inner-directed village youth do not all regard women's role in egalitarian terms, and it is the ones with egalitarian views who do well in French after they have left school. In terms of a causal relationship, it is intuitively understandable that in a village setting a youth who is enlightened and inner-directed should do well in French which is essentially a foreign language. The causal relationship with egalitarianism toward women, however, is not immediately apparent. It may well be that both French achievement and a positive attitude toward women's role are related to some other unmeasured factor. One is tempted to speculate that the unmeasured factor may be a latent affinity to French culture, in which women enjoy greater freedom than they do in rural Tunisia.

Predicting Rural Performance on the Arabic Test

Background Factor. Just as it is the best predictor of French achievement, the best predictor of Arabic among the background variables is whether the respondent's father listens to the radio. The family is providing help with the son's homework is also of importance for excelling in Arabic. Together these two variables account for fully 40 percent of the variance in Arabic scores.^{9/} It seems that Arabic achievers come from homes that are stimulating, not only because the father listens to the radio frequently, but also because there are people in the family who can and do provide help with homework.

Schooling Factor. From an educational point of view, the major source of differentiation between those who do well in Arabic and those who do not is finishing primary school. It seems that in the rural setting, where few people go on to secondary school, having a primary school education is the decisive factor for predicting post-school scholastic performance. Primary education is not a very powerful predictor, however, it explains 17 percent of the variance in Arabic scores among the rural respondents. ^{10/}

Job Factor. Length of employment is a significant predictor of Arabic achievement. Although this variable explains only 15 percent of the variance in Arabic scores, 11/ it is nonetheless impressive that any job-related variable should have an impact on the scholastic achievement of rural boys. That the job factor is a predictor for Arabic, but not French or arithmetic achievement, leads us to believe that the longer one has been employed, the greater will be his exposure to formal Arabic, while not necessarily to French and arithmetic. 12/

Behavioral-Attitudinal Factor. Having modern attitudes seems to be the best predictor of Arabic achievement among the behavioral-attitudinal variables. The role modernity plays in predicting post-school performance probably goes beyond the influence of the specific components of the modernity syndrome which we mentioned in connection with predicting French achievement - openness to change, for example, or placing a high value on education. Modernity as a general orientation to life seems to lead people to make more out of the education they had after they leave school.

Other behavioral-attitudinal variables that came out as significant predictors of Arabic scores are: not attributing the causes of student's failing in school to individualistic reasons, not having had much contact with city life, remembering the author of the last book read, and claiming to be unjustly punished at school. All together, these variables account for 73.5 percent of the differences in Arabic scores among rural school-leavers. 13/ A boy's remembering the author of last book he read implies a certain bookishness which fits in with scholastic achievement. The relevance of some of the other variables that are related to Arabic achievement is not immediately obvious. Yet at closer inspection, a certain pattern emerges. Boys who reject individualistic reasons for failing in school tend to come from small families with educated mothers, make a good salary themselves - in short, have a reasonable personal life. Those who have not had much contact with urban life, on the other hand, tend to be younger and less well-to-do. Those claiming to be unjustly punished at school have started school at an earlier age than most. Thus, the overall personal profile of an Arabic achiever seems to be a younger boy with modern attitudes but not well travelled, who started school early and probably did not have positive experiences in school, while at home he received individual attention from an educated mother.

Summary of Analyses Based on Separate Factors. Table 5.4 summarizes the impact of each factor on Arabic achievement. By and large, the strongest influence comes from the personal-attitudinal variables; among those, the influence of having modern attitudes is foremost. The second most influential factor is background. Among the background variables we see one that readily lends itself to manipulation: whether the respondent's father listens to the radio. The impact of the schooling factor on Arabic is not so large as it was for French. Here again, finishing primary school is the only schooling variable that has an impact on Arabic achievement. While no job-related variable had predictive value for French scores, length of employment turns out to be a predictor for Arabic.

Table 5.4

Determinants of Arabic Achievement
Among Rural School-Leavers

<u>Background factor</u>	<u>Direction</u>	<u>Variance</u>
28 Father listens to radio	+	.23
76 Family helps with homework	+	.13
<u>Schooling factor</u>		
54 Primary school levels	+	.17
<u>Job factor</u>		
65 Length of employment	+	.15
<u>Behavioral-Attitudinal factor</u>		
133 Overall modernity	+	.45
88 Student fails for individual reasons	-	.19
138 Urban contact	-	.09
123 Remembers author	+	.09
71 Unjustly punished at school	+	.04
<u>All factors combined</u>		
133 Overall modernity	+	.32
88 Students fail because of individual reasons	-	.09
76 Family helps with homework	+	.07
123 Remembers author	+	.06

Source: Tables E.5-E.9. in Appendix E.

Taking All Factors Simultaneously. When all factors are taken together, behavioral-attitudinal variables tend to dominate the others (see table 5.4). "Overall modernity" emerges as the most powerful predictor. It is accompanied by not attributing student's failures to personal reasons, getting family help with homework, and remembering the author of the last book read. "Father listens to radio," which emerged as a strong predictor under the background factor, and "primary school levels" under the schooling factor, apparently do not make significant contributions beyond what is already explained by "overall modernity," nor does "length of employment." We may interpret these results as indicating an enlightenment which was also predictive of French achievement. Arabic achievers, however, do not seem to be so inner-directed; in fact, they do not attribute a student's failure to personal reasons, but rather externalize the causes of failure. Also, they have not turned their back on their families; they have benefited from the help family members provide with homework. Thus, while both French and Arabic achievers are modern, primary-school graduates whose fathers regularly listen to the radio, the French achievers are pretty much loners, influenced by the distant French culture. Arabic achievers, by contrast, do not seem to be estranged from their local cultural roots.

Predicting Rural Performance on the Arithmetic Test

Background Factor. Several family background variables have sizeable effects on the arithmetic achievement of rural school-leavers. The largest effect comes from whether the respondent's father listens to the radio. A home where the father regularly listens to the radio seems to promote an educational climate in which school learning is not easily forgotten. The educational level of the person helping the respondent with his homework is also a predictive variable. The higher the helper's education, the better is the arithmetic retention. But having a large number of siblings has a negative influence - arithmetic achievers tend to come from small families where they presumably get individual attention and help from an educated person. Another source of influence is the father's desire to use any extra income for daily living expenses. ^{15/} This last finding implies that the arithmetic achiever comes from a relatively poor family. These four background variables mentioned account for as much as 53.4 percent of the variance in arithmetic scores among rural school-leavers. ^{16/}

Schooling Factor. No education-related variable seems to differentiate between those who are good in arithmetic and those who are not. Arithmetic is a subject primarily taught in school, yet curiously enough, the educational differentials among our respondents do not have an independent effect on arithmetic achievement. The reasons for this finding may be that a minimum level of schooling, which almost all rural respondents have had, assures some proficiency in arithmetic. Beyond that, however, additional years of primary or technical school do not add to the minimum base knowledge; they produce no observable effect. Also, too few respondents have had the secondary education which would bring about a sizeable secondary school effect.

Job Factor. Job-related variables do not have a significant effect on the arithmetic achievement of rural respondents, either. This finding is probably due to the fact that working in a village setting neither requires nor promotes a proficiency in math.

Behavioral-Attitudinal Factor. Again, "overall modernity" is the best predictor among behavioral-attitudinal variables. The importance of modern attitudes for post-school performance seems to go beyond an orientation which holds education sacred above all other values. In fact, those who excel in arithmetic say that they would not spend extra income from a hypothetical source on education, implying that they would rather spend the money on other pressing needs. (Their fathers expressed a desire to spend extra money on daily living expenses, indicating that the family needs all the money they can get to make ends meet.) Other behavioral attitudinal variables that emerge as significant predictors of arithmetic achievement are: suggesting that schools be improved by having more supervised extra-curricular activities, and claiming that the father was not a real source of influence on oneself. These four attitudinal-behavioral variables explain 49.1 percent of the variance in arithmetic scores. The overall personal characterization of a rural arithmetic achiever seems to be a boy with modern attitudes, from a family of modest means, who has gotten away from the influence of his father, and who looks to organized activities in school for self-expression.

Summary of Analyses Based on Separate Factors. The results of analyses are summarized in table 5.5. Arithmetic achievement of rural school-leavers seems to be influenced only by the background and behavioral-attitudinal factors. Among the background variables, the most influential is whether the father listens to the radio. Thus, again, we are led to suggest that distributing radios in the countryside would promote retention of school learning. Having a large number of siblings has a negative impact. This speaks favorably for the educational side-benefits of a program aimed at limiting family size in rural Tunisia. Among the behavioral-attitudinal variables, modernity is a strong predictor. Arithmetic achievers seem to come from homes of modest means. Who knows, for lack of other sources of stimulation, tight family finances may be partially responsible for promoting an interest in numbers!

Taking All Factors Simultaneously. The analysis obtained by pooling all factors together essentially supports the conclusions reached on the basis of separate analyses for each factor (see table 5.5). "Overall modernity" emerges as the most powerful predictor of arithmetic scores. It is accompanied by a positive effect from "helper's education," and negative effects from "number of siblings," "father influential on son," and "use extra money for education." "Father's media exposure," which had emerged as a significant predictor under the background factor, apparently does not make a unique contribution in addition to that provided by the five variables listed above. All in all, arithmetic achievement also seems to depend to a high degree on an enlightenment factor. Beyond that, we see a delicate balance of influences from the family playing a role. The arithmetic achiever's family may not be

Table 5.5

Determinants of Arithmetic Achievement
Among Rural School-Leavers

<u>Background factor</u>	<u>Direction</u>	<u>Variance</u>
78 Helper's education	+	.09
28 Father listens to radio	+	.24
7 Number of siblings	-	.14
21 Father uses extra money for living expenses	+	.12
<u>Schooling factor</u>		
(none)		
<u>Job factor</u>		
(none)		
<u>Behavioral-Attitudinal factor</u>		
133 Overall modernity	+	.12
82 Improve schools with supervised activities	+	.10
105 Use extra money for education	-	.09
67 Father influential on son	-	.07
<u>All factors combined</u>		
133 Overall modernity	+	.12
78 Helper's education	+	.09
7 Number of siblings	-	.11
67 Father influential on son	-	.09
105 Use extra money for education	-	.06

well-to-do, and if there are a lot of siblings this has a suppressing effect on achievement. Fathers' influence on their sons can also have a detrimental effect. The amount of schooling was not significant in predicting arithmetic achievement. So, rural arithmetic achievers seem to come from small families of modest means, where the father does not dominate the son, and yet there is a well-educated person who can provide help with homework.

Overview of Determinants of Post-School Achievement of Rural School-Leavers

An examination of table 5.6 indicates that the best predictors of rural achievement are behavioral-attitudinal variables. Their largest influence is on French and Arabic achievement. When we equate reading and comprehension of language with literacy, we see the overpowering role played by attitudinal variables. Of these, one stands out, and that is a cluster of attitudes we have identified as overall modernity in this study. Having modern attitudes seems to be a catalyst for retention of school learning.

The background factor also emerges as a strong predictor. Background variables have the least impact on French achievement and the most impact on arithmetic. It seems that in a rural setting French is learned mainly in the school, while arithmetic may also be learned, or at least practiced, at home. This interpretation is further supported by the finding that the schooling factor has its largest influence on French achievement, while it has no statistically significant influence on arithmetic.

Our study showed the job factor to be the least important in determining post-school achievement for the rural sample. It has no effect on French or arithmetic and only a modest effect on Arabic. We interpreted these findings as an indication that in a rural setting one's job neither requires nor promotes retention of school learning. It is equally likely, however, that the positive effects of job-related variables do not show up in our study because our sample is composed of young people, mostly in their late teens and early twenties, none of whom has had a long employment history. Among older people, job-related variables may well be predictive of retention.

Of the background variables, "father listens to radio" consistently turned up as an important source of influence on achievement in all three tests. As was mentioned earlier, such a finding immediately suggests a simple intervention program whereby the retention of school learning is increased through making radios more readily available in the countryside.

The only schooling factor component to have any impact on achievement seems to be completing primary school. A primary education is most important for learning French and somewhat important for Arabic. This finding would indicate that in terms of returns to educational investment, additional money would be most wisely spent on assuring universal primary school completion rather than initiating a costly rural secondary school system. Needless to add, investment in secondary education should not be laid aside as a long-term

Table 5.6

Summary Table for percentage of Variance Explained in Achievement
of Rural School-Leavers

(in percentages)

	French	Arabic	Arithmetic
Background factor	34.2%	40%	53.4%
Schooling factor	37.2	17.2	-
Job factor	-	14.8	-
Behavioral- Attitudinal factor	73.1	73.5	49.2
All factors combined	71.9	67.4	62

Source: Tables E.1-E.12 in Appendix E.

goal. The point being made here is that if the goal is to increase retention of school learning, investment in a comprehensive primary education program would seem to yield the highest social rate of return.

Taking all factors into consideration, we find that among other variables, we see the same cluster emerging as predictors of the scholastic achievement of rural school-leavers in all three tests. The cluster is made up of espousing modern attitudes, graduating from primary school, and having a father who listens to the radio regularly. These three variables are highly interrelated and seem to be tapping at the same underlying phenomenon - which we have labeled enlightenment. In the context of our study, enlightenment summarizes a life situation that is conducive to retention of school learning in a village. Enlightenment seems to be most closely associated with having modern attitudes. While having a father who listens to the radio regularly and finishing primary school are independently correlated with post-school achievement, the bulk of their predictive power seems to come from increasing a person's modernity which, in turn, has a powerful effect on promoting retention. These conclusions are based on data gathered in a village. We will now turn to analyzing data from a suburb of Tunis to see if the same conclusions hold in an urban setting.

Predicting Urban Performance on the French Test

Background Factor. Two background variables emerge as significant predictors of French achievement among urban school-leavers. One is the number of people supported by family income, the other is respondent's age. These explain 17 percent of the variance in French scores. 17/ Since it is mostly rich families who support a large number of people, urban French achievers tend to come from well-to-do homes. On the other hand, the age variable is closely related to having a positive job experience. Older respondents claim that their education is relevant to their work and that they have satisfying jobs in which they make use of literate skills. Thus, the positive relationship between age and French achievement seems to be related, in turn, to job-related variables. 18/

Schooling Factor. Several schooling variables have an impact on the French score. As was the case with rural school-leavers, the urban boys' French achievement also benefits from a primary education. In addition, attending secondary school and changing schools have positive impacts, while starting school at a later age has a negative impact. Together these four schooling variables account for 42.1 percent of the differences in urban French scores. 19/ The separate contribution of a secondary education beyond primary is probably due to the greater percentage of urban youth having attended secondary schools. The positive effect of changing schools needs to be interpreted in the light of recent migrations to La Goulette, the site of our urban sample. A few years before the survey took place, a sizeable number of families migrated to La Goulette from the Northern Sahel region. These Saheli families are reputed to provide an educational background for

their children superior to that provided by the average La Goulette family; 20/ hence the positive effect of starting primary school at a late age seems to be due to the generally low educational attainment of these late-comers. In the Tunisian educational system a youth has to be 15 or younger when finishing primary school to be able to attend secondary school. Because they frequently repeat failed grades, late-comers are unable to go beyond primary school; in fact, many of them do not stay in school long enough to get a full six-year primary education. 21/

Job Factor. It was mentioned in connection with the age variable under the background factor that if a respondent claims that his schooling helps him on his job, he tends to perform well on the French test. "Schooling helps work" is the job variable that emerges as a significant predictor under this factor; it accounts for 11 percent of the variance in French scores. 22/

Behavioral-Attitudinal Factor. None too surprisingly, "using French" is the best predictor of French achievement among the behavioral-attitudinal variables. "Using French" is a composite variable indicating frequent contact with the French language in daily life. 23/ The fact that it emerges as the best predictor underscores the power of practice in a foreign tongue. But, of course, there is a circularity here: those who are proficient in the language are more apt to use it in their everyday lives, and use further increases their proficiency. The other variables that emerged as significant predictors under this heading do not make sizeable contributions (see table 5.7). "Writing letters in Arabic," proposing to "improve schools by helping the poor," and claiming that they "did not have adequate lighting for doing homework when they were in school" have small positive effects. A small negative effect comes from comparing one's job with his father's - urban French achievers claim to have less prestigious jobs than their fathers. All together, behavioral-attitudinal variables account for 60.9 percent of the variance. "Writing letters in Arabic" seems to be another indicator of the general literacy of French achievers. That (they also write letters in French does not emerge as a separate predictor because it is part of the composite variable "use French.") Proposing to "improve schools by helping the poor" may be an indication of their sensitivity to the problems involved in coming from an impoverished background. In fact, they complain of "lack of adequate lighting" as one of the problems they face in doing homework. Since it is unlikely that they personally came from poor homes, however, their fathers have sufficiently good jobs to make their own jobs seems less prestigious by comparison. Rather, complaining of lighting problems may be an indication of the importance they attach to doing homework.

Summary of Analyses Based on Separate Factors. By far the most influential factor in urban French achievement is the behavioral-attitudinal. Among behavioral-attitudinal variables, "use French" has the largest impact on French achievement. There would seem to be a circularity between scoring well on the French test and using French frequently - those who know French well use it; those who use it often improve further their facility with practice.

Table 5.7

Determinants of French Achievement
Among Urban School-Leavers

<u>Background factor</u>	<u>Direction</u>	<u>Variance</u>
17 Number of persons supported by family income	+	.10
42 Respondent's age	+	.08
<u>Schooling factor</u>		
54 Primary school levels	+	.12
48 Changed schools	+	.07
165 Secondary school levels	+	.04
46 Age at entering primary	-	.03
<u>Job factor</u>		
93 Schooling helps work	+	.11
<u>Behavioral - Attitudinal factor</u>		
136 Use French	+	.52
124 Write letters in Arabic	+	.02
81 Improve schools by helping poor	+	.03
95 Job compared to father's	-	.03
74 Lighting a problem in homework	+	.02
<u>All factors combined</u>		
136 Use French	+	.24
57 Primary school level	+	.03
17 Number of people supported by family income	+	.03
48 Changed schools	+	.04
74 Lighting a problem in homework	+	.02
95 Job compared to father's	-	.02

Source: Tables E.13-E.17 in Appendix E.

The schooling factor has a modest effect, in which the largest impact comes from completing primary school. Secondary school has a statistically significant but small influence. Given that only 19.3 percent of the urban sample attended, the large-scale effects of secondary school are overshadowed by a primary education.

The background factor also has a modest effect. French achievers come from large families - which tend to be sufficiently well-off to support so many people - and are generally older. Older respondents have had jobs for a longer time - usually jobs that are relevant to their education.

None of the variables discussed as predictors of French achievement among urban school-leavers lends itself to easy manipulation. One exception may be to get a person to use his knowledge of French in as many ways as possible; but this may be difficult if the person knows little French to begin with.

Taking All Factors Simultaneously. When all factors are taken together, "use French" emerges as the most powerful predictor. This variable seems to pick up most of the variance explained by primary school and all the variance explained by secondary school, plus the advantages of having a job related to one's education. This indicates that well-educated respondents are the ones who use French in their everyday lives. Coming from a large family, changing schools as a result of migrating from the Sabel, and complaining of inadequate lighting make small but significant contributions, as does having a less prestigious job than one's father. 24/

Predicting Urban Performance on the Arabic Test

Background Factors. The best predictor of Arabic achievement among background variables - "someone in the family prays" - has a negative influence. That is, coming from a religiously observant family seems to be a deterrent to Arabic achievement. The reason for this negative impact is unclear. Socioeconomic status has a positive impact in that urban boys from well-to-do families tend to score higher on the Arabic test. On the other hand, boys whose fathers go to Tunis frequently do not perform so well. This is a rather perplexing finding; if anything, one would speculate that father's urban contact would have a positive effect on achievement; however, the zero-order correlation between "frequency of father's urban visits" and Arabic achievement is only .077. Thus, by itself, "father's urban visits" do not seem to be linked to low Arabic achievement. It is only in non-tradition-oriented, high socioeconomic-status families that father's frequent visits to the city have a detrimental effect on son's performance. The last background variable to emerge as a significant predictor of Arabic indicates that having both parents supervise son's education has a positive effect on the son's Arabic performance. Thus, the father's presence to supervise son's education seems to be beneficial, while his frequent absences turn out to be detrimental.

Together, the four background variables account for 23.6 percent of the variance in Arabic scores. ^{25/} The background of the urban school-leaver who excels in Arabic seems to be heavily accented by a lack of religious observance, high socioeconomic status, and close parental supervision.

Schooling Factor. In addition to completing primary school, secondary school attendance also has a positive impact on Arabic achievement. Together these two schooling variables account for 24.4 percent of the variance in Arabic scores. In contrast to the lack of importance of a secondary education for predicting the achievement of rural boys, in the urban sample secondary schooling has some predictive value, as more urban boys have attended secondary school.

Job Factor. The only job variable to have an impact on Arabic achievement is whether the respondent's work requires reading and/or writing. The explanatory power of practicing literate skills on the job is rather small, however - only 5 percent.

Behavioral-Attitudinal Factor. The six behavioral-attitudinal variables that emerge as significant predictors of Arabic explain 49.8 percent of the variance in the test scores. Doing well on the Arabic test seems to be related to desiring a high-status job. A solid knowledge of formal Arabic is certainly an asset in getting a prestigious job in the cities. Another indicator of doing well in Arabic is writing letters often. We found that those boys who scored high on the Arabic test were the ones who claimed that they wrote letters in Arabic and as recently as within the week of the interview. Arabic achievers also display a need for achievement, which accords with their desire for a high-status job. Yet they also have a sense of social responsibility; they suggest that schools should be improved by aid to the poor and by providing better facilities. The composite picture of the urban school-leaver who excels in Arabic is that of a highly literate person with personal ambition, but one who also cares to make social improvements.

Summary of Analyses Based on Separate Factors. Again, the best predictor of achievement is the behavioral-attitudinal factor (see table 5.8). Behaviors and attitudes conducive to excelling in Arabic are a sense of personal ambition, coupled with a sense of social responsibility, plus a tendency to use one's literate skills, as in writing letters often.

The contributions made by the schooling and background factors are about equal in magnitude. In terms of schooling, what matters most is finishing primary school, while secondary school attendance also has an effect. In terms of background, Arabic achievers come from non-religious, well-to-do families where parents closely supervise the son's education.

The job factor makes a small contribution: having a job in which one can use his literate skills is related to scoring high on the Arabic test.

All in all, none of the variables that emerge as significant predictors under the four factors lends itself to easy manipulation.

Taking All Factors Simultaneously. Six variables survived the competition in the final regression analysis to explain 53.5 percent of the variance in Arabic achievement of urban school-leavers. "Desiring a high status job" - a behavioral-attitudinal variable - emerged as the most powerful predictor (see table 5.8). Family SES and variables related to parental supervision of education were eliminated, since "desiring a high-status job" seems to contain the same information. "Coming from a non-religious family," however, still has an impact; so does "writing letters." The level of literacy exemplified in letter-writing seems to make the information on primary school education redundant; finishing primary did not enter the final list of predictors. On the other hand, secondary school still makes a small but significant contribution, along with "need for achievement." The variables related to suggestions for improving schools are absent from the final list. These results help elaborate our previous conclusions on the Arabic achievement of urban school-leavers. They are well-educated, highly driven, upwardly mobile boys who come from better-off families. The source of their personal ambitions may be rooted in close parental supervision when they were young, but now that they are older they are driven by an internal need to achieve. Their drive to attain high-status jobs reflects an ambition to do well, in the classical need-for-achievement sense (McClelland and Winter, 1969), and not as a desire to attain personal power.

Table 5.8

Determinants of Arabic Achievement
Among Urban School - Leavers

<u>Background Factor</u>	<u>Direction</u>	<u>Unique Variance</u>
29 Someone in family prays	-	.16
SES Socioeconomic status scale	+	.07
1 Frequency of father's urban visits	-	.07
32 Both parents supervise son's education	+	.04
<u>Schooling Factor</u>		
54 Primary school levels	+	.12
165 Secondary school levels	+	.07
<u>Job Factor</u>		
94 Work requires reading/writing	+	.05
<u>Behavioral-Attitudinal Factor</u>		
98 Status of job desired	+	.14
126 Last time wrote letter	+	.05
137 Need for achievement	+	.06
85 Improve schools by better facilities	+	.03
81 Improve schools by helping poor	+	.03
124 Write letters in Arabic	+	.03
<u>All Factors Combined</u>		
98 Status of job desired	+	.10
126 Last time wrote letter	+	.02
137 Need for achievement	+	.04
29 Someone in family prays	-	.06
124 Write letters in Arabic	+	.07
165 Secondary school levels	+	.03

Source: Tables E.18-E.22 in appendix E.

Urban Arithmetic

Background Factor. The background of the urban arithmetic achiever closely resembles that of the French achiever. Both are relatively older and come from well-to-do families on whose income many people are supported. One difference is that while parental supervision has no bearing on French achievement, father's supervision of son's education has a negative effect on arithmetic achievement. The background factor explains 22 percent of the variance in arithmetic scores.

Schooling Factor. Finishing primary school is the best predictor of arithmetic scores among schooling variables. Secondary school attendance also makes a significant contribution. Together schooling explains 35.7 percent of the variance in arithmetic scores. The reverse of these results is true for the arithmetic achievement of the rural school-leaver: those boys are more influenced by their family background, while their schooling has little power to predict their scores.

Job Factor. Two job-related factors emerge as significant predictors of arithmetic achievement, explaining 16 percent of the variance in test scores. Curiously enough, looking for a job has a negative impact because it is those who have a bad job situation who keep looking for jobs. Having a dissatisfying job is associated with arithmetic incompetence. On the other hand, having a job in which one can make use of literate skills promotes competence in dealing with numbers.

Behavioral-Attitudinal Factor. Having modern attitudes, writing letters in Arabic, and using French turn out to be the best behavioral-attitudinal predictors of arithmetic scores. Together they explain 44.7 percent of the variance. Arithmetic achievers seem to be modern in attitudes and adept at using the French language. Yet their literacy is not confined to the French language; they are quite literate in Arabic also, as attested to by their writing letters in Arabic.

Summary of Analyses Based on Separate Factors. The behavioral-attitudinal factor has the largest impact on arithmetic achievement. Being modern in attitudes and engaging in literate behaviors such as writing letters are the personal characteristics of urban school-leavers who excel in arithmetic.

Schooling variables have a large impact on arithmetic achievement. Education, including secondary school attendance, seems to be a requisite for doing well in arithmetic.

The background factor has less of an impact than either the behavioral-attitudinal or the schooling factor. The urban arithmetic achiever comes from a well-to-do family in which the father does not take an active role in supervising the son's education. He is also relatively older, which means he has had more experience on the job.

The boys' job factor has an impact in that a dissatisfying job, unsuited to one's abilities, has a depressing effect on the arithmetic score, whereas a job that requires reading and writing skills seems to raise one's score.

The best predictors of arithmetic achievement do not lend themselves to easy manipulation. Having modern attitudes, coming from a privileged home background, having a good job where reading and writing are used, and being well educated all predict arithmetic achievement. But, then, if something could be done so that all people could come from rich families, receive a good education, and have good jobs, the battle would be won. We would no longer be so concerned with increasing arithmetic achievement!

Taking All Factors Together. Seven variables emerge as the best predictors of arithmetic achievement when all factors are taken together. They explain 64.8 percent of the variance in test scores. They leave our previous conclusions about arithmetic achievers largely unchanged. Modernity tops the list as the most powerful predictor (see table 5.9). Urban school-leavers who excel in math are the privileged young men of Tunisia. They are independent of the influence on their fathers, who are likely to be less educated than they. They come from large, well-to-do families and have had a good education. They have high-caliber jobs and a relatively longer employment history. They are highly literate and they use their literacy, not only in their jobs but also in their personal lives. In a sense, the profile of the arithmetic achiever gives credence to the old saying, "Good things go together."

Summary of Achievement of Urban School-Leavers

Overall, the behavioral-attitudinal factor predicts post-school scholastic achievement better than any other factor. Schooling is relatively more influential than background, while the job factor is the least influential (see table 5.10).

The family background of urban achievers is similar to the extent that they tend to come from well-to-do homes. The dissimilarity is in the effectiveness of parental supervision of education. Parents are important for Arabic achievement, so much so that the father's frequent absences for trips to Tunis have a depressing effect on the son's Arabic score. On the other hand, father's supervision has a negative effect on arithmetic achievement. The fathers we interviewed were at most primary graduates, even though most had had some years at the kuttab. They could not have provided active help in any of the subject matters on which we tested the respondents, except for Arabic. (The fathers are likely to know classical Arabic as a result of their Quranic training.) Even then, father's supervision of Arabic learning has to be carried out with a secular emphasis because religious observance in the family has a negative effect on Arabic achievement.

Table 5.9
Determinants of Arithmetic Achievement
Among Urban School Leavers

<u>Background Factor</u>	<u>Direction</u>	<u>Unique Variance</u>
42 Respondent's age	+	.11
17 Number of person's supported by family income	+	.07
30 Father supervises son's education	-	.06
<u>Schooling Factor</u>		
34 Primary school levels	+	.22
165 Secondary school levels	+	.07
<u>Job Factor</u>		
66 Looked for work	-	.09
94 Work requires reading/writing	+	.05
<u>Behavioral-Attitudinal Factor</u>		
133 Overall modernity	+	.09
124 Write letters in Arabic	+	.10
136 Use French	+	.07
<u>All Factors Combined</u>		
133 Overall modernity	+	.12
54 Primary school levels	+	.10
30 Father supervises son's education	-	.06
124 Write letters in Arabic	+	.05
66 Looked for work	-	.02
165 Secondary school levels	+	.02
17 Number of people supported by family income	+	.02

Source: Tables E.22 ¹/_N E.27 in Appendix E.

Table 5.10

Summary of Variance
Explained in Achievement
of Urban School Leavers
(in percentages)

	French	Arabic	Arithmetic
Background	17%	23.6%	22%
Schooling	42.1	24.4	35.7
Job	11	4.8	16
Behavioral-attitudinal	60.9	49.8	44.7
All factors combined	65.8	53.5	64.8

table
part

Source: Tables E.13 - E.27 in Appendix E.

For all three tests we find a positive effect coming from both primary and secondary education. Still, finishing primary is a more powerful predictor of achievement than is attending secondary school.

The job factor has a small effect on achievement, especially among those who are older. People who have worked in jobs where they use their literate skills for some time benefit from the experience. If our sample had had more on the job experience, very likely we would have found the job factor to be more important in determining retention of school learning.

Using literate skills in French and in Arabic is a common behavioral characteristic of urban achievers. An urban environment provides many avenues of participation in social life through literacy. Those who often engage in behaviors requiring literacy - e.g., writing letters - are able to score high on the achievement tests. In general, the achievers are modern in attitude and show a desire for upward mobility. Some of them probably consciously cultivate literacy as a tool for obtaining more prestigious jobs.

On the whole, we find that coming from a well-to-do family, having a good job, using one's literate skills in daily life, and desiring a high-status job all promote the development and retention of cognitive achievement. These results do not leave much room for intervention. In a way, they point out that if you have it made in terms of home background, education, and job, you also remember what you learned in school. Conversely if you are not so privileged, you do not benefit from your schooling. These results point out that improving the retention of urban school-leavers cannot be attained by superficial manipulations. Basic structural changes may be necessary to increase the long-term effectiveness of education for all urban Tunisians, privileged and underprivileged.

SUMMARY AND CONCLUSIONS

In this chapter, we set out to explore why some school leavers were skilled in the areas we tested them, while others were relatively ignorant. The tests we administered were designed to assess our respondents' literacy in formal Arabic, French, and basic arithmetic. Since almost all respondents had attended school for at least a few years, we sometimes referred to our dependent variable as "retention of school learning." Here retention was used only in a loose sense because we did not have independent measures of what each respondent knew at the time he left school which we could then compare with his test performance at the time of the interview. (In chapter 6 we return to the issue of retention.)

In our initial explorations, we found that the amount of education one has is a good predictor of his post-school scholastic achievement. On the average, education explains 25 percent of the variance in test scores.

The number of years one has been out of school, however, seems to have no bearing on post-school literacy.

A more systematic investigation of the determinants of differences in test scores was carried out by focusing on four classes of dependent variables: the background factor, schooling factor, job factor, and behavioral-attitudinal factor. These factors were somewhat more powerful in explaining the long-term effectiveness of education for rural respondents than for urban respondents (compare table 5.6 with table 5.10). On the average, we were able to explain 66 percent of the differences in rural test scores as opposed to 60 percent of the urban. The behavioral-attitudinal and background factors had the most influence on the achievement of rural school-leavers. For the urban respondents, while the behavioral-attitudinal factor continued to be a source of influence, schooling was more important than background. Also, in general the job factor had more of an impact on urban than on rural respondents.

Modernity turned out to be the single most powerful attitude for promoting retention of school learning, especially for the rural boys. The positive impact of modernity may be due to fostering an orientation to life in which education plays a central role. For the modern villager education is more in the realm of values and attitudes. For the modern suburbanite, however, the centrality of education refers to engaging in literate behaviors in everyday life. Such literate behaviors as speaking French or writing letters have more instrumental value in adjusting to an urban environment. Thus their positive effect is mostly confined to the urban sample.

In the urban sample we find a desire for high status jobs to be related to test performance because it is possible to get prestigious jobs in the city. This possibility translates into a hope for upward mobility, motivating retention of school learning, as education may be a factor in getting good jobs. In a village where education is mostly irrelevant to the type of jobs one can reasonably hope to get, a desire for high status jobs does not seem to promote post-school achievement. On the other hand, we see in the rural achievers, especially those who do well in French, an "outward" orientation, as if their education were a preparation for life outside the village. More than likely these highly literate villagers will emigrate to the cities and possibly look for work abroad. It seems that unless literacy can be made relevant to living and working in a village, many talented people will forget what they learned in school. Those who retain their learning will look for opportunities to seek their fortune elsewhere.

For the rural sample we found that among all the schooling variables primary school was the best predictor of literacy. Only a small percentage had attended secondary school from the village. One reason may be that secondary school is not necessary to attain basic literacy. Our results regarding schooling suggest that if the goal is universal literacy, investments for rural education be channeled to making a primary school

education available to everyone. As far as basic literacy is concerned, there seems to be no added advantage to undertaking a costly expansion of the secondary school system in the countryside. Yet literacy is only one of the goals of education; our suggestions are valid if the main goal is attaining universal literacy. It is not valid, for example, if the goal is to train technical cadres to carry out the burden of economic development. It is also not valid if education is viewed as a basic right rather than a privilege.

For the urban sample we find primary education to have a powerful effect on achievement also, but it is accompanied by a lesser effect from secondary education. A greater percentage of our urban respondents had attended secondary school and we did get a significant, if weak, secondary education effect. Basically our schooling results show the differences between high achievers and low achievers to be having or not having a primary education. However, among primary graduates, we find that those who have gone on to secondary school score higher on the literacy tests. These results underscore the importance of a primary education for literacy while at the same time highlighting the added advantages of at least two years of secondary education given the present system. Here again, if the goal is universal literacy, a comprehensive primary education program is where the investments need to be made.

In general the rural achiever comes from a family of modest means. His father listens to the radio regularly and he can get help with his homework -- in a rural sense, he comes from a "culturally enriched" background. He has finished primary school and holds modern attitudes. If radios were more readily available and if more students could finish primary school, rural literacy levels might be improved. Urban achievers, on the other hand tend to come from economically well-off families. Since most urban fathers have easy access to mass media, their listening to the radio does not play a role on the sons' literacy level. Urban achievers have finished primary school and some have gone on to secondary school. They have jobs relevant to their education. They use their literate skills not only on the job but also in their daily lives. In addition, they have aspirations for high status jobs. If we consider literacy to be an advantage in getting good jobs, we have a situation in the urban areas where the already privileged have an added advantage. That is, under the present system the children of well-to-do families go to school, get good jobs, and remember what they learned in school. This circle, which works benignly for the privileged, is vicious for the under-privileged. A first, but not sufficient step would be to assure that all children stay in school to say the eighth grade. The present education system discourages weak students mainly through passing a certain number of students and forcing others to repeat and eventually drop out. This system works against the children of poor families in urban areas.

FOOTNOTES FOR CHAPTER 5

1. The average inter-test correlation was .496 for the rural sample and .475 for the urban.
2. For a complete listing of variables under each factor see Appendix A.
3. See Table E.1 in Appendix E for results of the regression analysis.
4. See Table E.2 in Appendix E for results of the regression analysis.
5. See Table E.3 in Appendix E for results of the regression analysis.
6. It should be noted that not all respondents who do not get news from their friends do well in French. It is only the ones with modern attitudes towards women and also in general, who go to the movies often and also do not rely on their friends for news that do well in French. Since our results are based on a multivariate analysis, singling out variables with significant contributions-unless the variable has a zero-order correlation which closely matches the standardized regression coefficient, beta-is likely to lead to erroneous conclusions. In the case of "get news from friends," for example, the zero-order correlation with French achievement is nearly nil at .085. If one were to base his conclusions on such univariate analyses as zero-order correlations, he would conclude that there is no relationship between French achievement and relying on friends as a source of news. However, this same variable has a beta coefficient of -.377 when "overall modernity," "role of women," and "frequency of movie attendance" have already entered the step-wise regression equation (See Table E.3 in Appendix E). Thus we are able to conclude that there is a negative relationship between relying on friends for news and French achievement but only among those who are modern and movie going.
7. The correlation between "secondary school levels" and status ranking of "occupation" is only - .075.
8. See Table E.4 in Appendix E for results of the regression analysis.
9. See Table E.5 in Appendix E for results of the regression analysis.
10. See Table E.6 in Appendix E for results of the regression analysis.
11. See Table E.7 in Appendix E for results of the regression analysis.
12. It should be noted that our conclusions are based on statistical analyses where achievement is treated as the dependent variable.

Had we decided to treat achievement as an independent variable, we would have found arabic achievement to be a predictor of length of employment. A plausible explanation for this hypothetical finding might be that those who are better in Arabic find jobs sooner than their less proficient peers, and also keep them longer. However, the structure of rural employment in Tunisia leads us to reject using achievement as a predictive variable. Proficiency in formal Arabic does not seem to be a factor for finding and keeping a job in a village.

13. See Table E.8 in Appendix E for results of the regression analysis.
14. See Table E.9 in Appendix E for results of the regression analysis.
15. The boys as well as their fathers were asked these two questions among others in the interview; "What would you do if you received 5 sinars (approximately \$10) unexpectedly?" and "What would you do if you received 100 Dinars (approximately \$200) unexpectedly? Answers to these questions were coded in several ways, depending on what each said he would spend the money on. If living expenses mentioned in response to either the 5 Dinar or 100 Dinar question, the response scored as "yes" on the variable "use extra money for living expenses." If savings was mentioned, it was coded as "yes" on the variable "use extra money for savings." There were also codes for "use extra money on education," and "use extra money for leisure."
16. See Table E.10 in Appendix E for results of the regression analysis.
17. See footnote 12 for an explanation of this variable.
18. See Table E.11 in Appendix E for results of the regression analysis.
19. See Table E.12 in Appendix E for results of the regression analysis.
20. See Table E.13 in Appendix E for results of the regression analysis.
21. "Respondent's Age" correlates .404 with "Schooling helps work" and .308 with "work requires reading-writing." These latter two variables correlate .332 and .309 with French achievement, respectively.
22. See Table E.14 in Appendix E for results of the regression analysis.
23. See 1966 Census on migrations from the Sabel region.
24. The correlation between "age at entering primary" and "primary school levels" is $-.323$.

25. See Table E.15 in Appendix E for results of the regression analysis.
26. See Appendix A for details on the construction of "use French."
27. See Table E.16 in Appendix E for results of the regression analysis.
28. See Table E.17 in Appendix E for results of the regression analysis.
29. See Table E.18 in Appendix E for results of the regression analysis.
30. See Table E.19 in Appendix E for results of the regression analysis.
31. See Table E.20 in Appendix E for results of the regression analysis.
32. See Table E.21 in Appendix E for results of the regression analysis.
33. See Table E.22 in Appendix E for results of the regression analysis.
34. See Table E.23 in Appendix E for results of the regression analysis.
35. See Table E.24 in Appendix E for results of the regression analysis.
36. See Table E.25 in Appendix E for results of the regression analysis.
37. See Table E.26 in Appendix E for results of the regression analysis.
38. See Table E.27 in Appendix E for results of the regression analysis.

Chapter 6

Schooling for Behavior: Development or Autocolonialism?

Schools not only develop cognitive skills, but they also shape behavior patterns that are considered important for economic development. The hiring practices of employers indicate, for example, that they may be more concerned about the affective characteristics of potential employees than about their cognitive, or even their technical capacities (Gintis, 1971). In agricultural as well as industrial cultures, the society has increasingly relied on the schools rather than parents to develop the behavior desired by parents, employers, and society. The most striking example of behavioral guidance of infants and students is probably the kibbutz system of Israel. Are schools in other countries of the third world, in which desired behavioral changes are less well programmed into the schooling process, having a positive impact on students' behavior?

This question assumes critical importance in societies with a colonial heritage. Initially, colonial rule introduced Western education to train a few people for jobs in the colonial administration. This meant learning the colonial language, and those traits of accent, dress, and behavior that would increase one's chances for being hired and promoted. Schools, especially secondary boarding schools, it was found, were effective in producing this desired national elite. Boarding school, and then work experience, modified the behavior of individuals who aspired to conform to the needs of the colonial rulers. Even after independence, the colonial norms of behavior were usually maintained.

The literature contains considerable discussion of severe problems of cultural identity and cultural confusion that colonial and post-colonial societies have experienced, but there has been virtually no quantitative analysis of the situation, particularly of the role of the schools. This chapter is a first step in an attempt to offer a more systematic examination of this situation. Our goal is to develop hypotheses for future exploration rather than to reach firm conclusions.

The objective for education during the colonial period was clear. In the words of Albert Charton, Inspector General for Education in French West Africa: "Through education, conquest and domination become a kind of moral annexation." (Charton, xxxx, p. 101) The successful effects of this use of education have been described for Morocco, Algeria, and Tunisia by Fanon (1967), Galagher (xxxx), Golino (xxxx), Khatbi (xxxx), and Demeersman (xxxx). Does this "moral annexation" still occur through the continued teaching of the French language and culture in the independent countries? If so, is its net impact positive or negative on individual and social development?

To focus our analysis we will use the concept of modernity, as defined in chapter 5, to measure individual behavior. Modernity is also a necessary measure of westernization. How effective have schools been in developing Western or "modern" behavior? We will argue that their impact has been significant. Next, the issue of cultural alienation will be examined. We will argue that while French language ability rather than Arabic continues to be the way to achieve school success and job status in the modern Arab culture of Tunisia, it is the socially isolated students are proficient in French. These results raise a basic issue: Does French achievement in school, the means by which socially isolated students are promoted into the elite, have the effect of reinforcing a social behavior and widening the cultural schism desired by the colonial officials?

Modernity: A Determinant of Student Achievement?

Before examining this question of where having modern attitudes contribute to the level of a student's cognitive achievement, we will review the level of modernity among the rural and urban groups. Table 6.2 summarizes the levels of modernity measured on a scale of 0-15. While urban levels tend to be higher than normal—they are small. The differences between students and workers also are small.

Table 6.1
Levels of Modernity

	<u>Rural</u>			<u>Urban</u>		
	<u>n</u>	<u>mean</u>	<u>std. dev.</u>	<u>n</u>	<u>mean</u>	<u>std. dev.</u>
Students	44	9.30	3.31	88	9.68	3.87
Workers	36	8.94	3.19	88	9.75	3.52
Both	80	9.14	3.26	176	9.71	3.69

Source: Appendix A for a full description of the measure.

In chapter 4 we found that modernity, as we have measured it, is not a significant determinant of student achievement although we found that it caused worker achievement in chapter 5. The major reason for the finding may be that the items measuring modernity are more relevant to adults than to youth. (See annex table 6.A for further discussion of the data.)

Modernity: A Result of Schooling?

Does schooling contribute to individual modernity? If modernity is a consequence of schooling, then at what point should we measure this relationship: (1) after the men have had some schooling but are still in school? or (2), do we measure it after they have left school, allowing the passage of time to mature the effect of schooling? Chapter 5, about workers, discussed the latter possibility and found that if other conditions were satisfied, then the more schooling that a worker had, the higher his level of modernity. The apparent causality of that findings should be noted. In the years after school, schooling predicts achievement only through modernity. Thus we found that schooling is the best predictor of modernity and that modernity is the best predictor of the cognitive achievement of workers.

Do these findings hold for the men who are still in school? We find, using the regression methods described in appendix B, that for both rural and urban students, school attendance contributed to modernity—but only if other conditions are fulfilled. For the rural students, the use of French is a more important determinant of modernity than the years one had spent in school (See table 6.2) Thus students who had significantly more years of schooling than others, but who nevertheless did not use their French skills in reading the newspapers or speaking, had lower levels of modernity than students who did. By our definitions of modernity, being able to speak French is not evidence of modernity. Background dimensions, so important in determining cognitive achievement, were not significant in determining the modernity of the rural group. Of the three factors, the personality dimensions were the strongest predictor: these included high levels of achievement motivation, participation in local organizations, aspirations for a job that uses a high level of education, and a desire to use additional money on non-educational expenditures. The significant finding is that simply having more years of education is not enough for achieving modern attitudes and behavior. Using French language skills and certain personality traits, such as need achievement, must implement the schooling experience of modernity is to involve.

Table 6.2

Determinants of Modernity among Rural Students

<u>School</u>	<u>Direction</u>	<u>Variance</u>
Uses French	+	.07
<u>Background</u>		
(None)		.00
<u>Personality</u>		
Money Use	-	.04
Need Achievement	+	.07
Job desired.	+	.05
Years in?	+	.03

Source: Annex table 6.E.

Table 6.3

Determinants of Modernity among Urban Students

<u>School</u>	<u>Direction</u>	<u>Variance</u>
Use of French	+	.20
<u>Background</u>		
Mother goes to movies	+	.11
<u>Personality</u>		
Use of money for leisure	-	.11

Source: Annex Table F.10 (Rerun 6.3)

To conclude our discussion of modernity we need to review the evidence, including that from chapter 5, about the effect of schooling and other factors on the modernity of workers. We found that as determinants of modernity for both rural students and urban workers, the background and personality when combined, tended to equal the significance of the schooling variables taken by themselves. Age was an important predictor for these samples. For urban students and rural workers, the schooling factor had a more important effect than either background or personality factor. Being employed is modestly correlated with modernity, but does not explain much variance in modernity levels. Urban workers who repeated grades of school had significantly lower modernity levels. If we assume that the act of repeating grades contributes to less modern attitudes, rather than being a proxy for a characteristic we have not measured, then this is strong evidence for the effects of the failure syndrome.

Determinants of modernity among rural school leavers are: having a father who regularly listens to the radio, finishing primary school, having a well paying job, close ties with friends and relatives and familiarity with the French Language sufficient to use it in daily life (See Table 6.4). Modern school-leavers seem to be well integrated into their rural community through a network of friendships with peers. They tend to come from moderately well-to-do families as witnessed by their reluctance to use extra money on family living expenses and also by the fact that they have high salaried jobs. In a sense they are the elite among the young villagers. These same young men are the ones who remember more of what they learned in school after they dropped out. Not only is modernity the best predictor of post-school scholastic achievement for rural school leavers (See chapter 5.), but some of the predictors of post-school achievement are also significant for predicting modernity (compare Tables 5.6 and 6.4)

Table 6.4

Determinants of Modernity among Rural Workers

<u>Background factor</u>	<u>Direction</u>	<u>Variance</u>
28 Father listens to radio	+	.19
<u>Schooling factor</u>		
54 Primary school level	+	.16
136 Use French	+	.09
<u>Job factor</u>		
64 Salary	+	.24
<u>Behavioral-attitudinal factor</u>		
104 Use extra money for family living expenses	-	.14
118 Get news from friends	+	.14
57 Leave school due to background factors	+	.12
113 Best friend a relative	+	.07

Source: Tables F.1 - F.4 in Appendix F.

In brief, the results suggest that schooling can be a determinant of modernity. Other variables, including personality of the student and worker, and his background, are also important. Schooling mainly appears to affect individual modernity depending on whether or not the student and worker actually use French frequently. Except for individuals from families where French could be easily learned at home, the ability to use French was learned at school. (This study did not collect data on whether or not French was becoming more or less important in Tunisia. But our impression is that it is no less important that it was ten years ago.) Finally, those students who knew French, but did not use it, were less modern than those who did.

Among urban school leavers the most powerful predictors of modernity are age, attending secondary school and using French in daily life (See Table 6.5) The urban environment is full of modernizing influences such that the longer one has been exposed to it - the older a respondent is, relative to our young sample - the more likely he will espouse modern attitudes. Since a rural environment does not have a modernizing impact, age is not a predictor of modernity. Given that a higher percentage of urban school-leavers attended

secondary school, we are able to document the modernizing impact of secondary education. It seems that the modernizing impact of education works mostly through acquainting students with the French language and exposing them to French culture. Those who use French in their daily lives such as reading French newspapers or writing letters in French are quite modern in attitude. An interesting point is that the modernizing influence of reading newspapers and writing letters does not seem to be inherent in the activities themselves, but in using French, for when these same activities are carried out in Arabic, they do not lead to increased modernity (Erut, 1972).

Table: 6.5

Determinants of Modernity among Urban School-leavers

<u>Background factor</u>	<u>Direction</u>	<u>Variance</u>
42 Age	+	.24
SES Socio-economic status	+	.04
29 Someone prays	-	.06
6 Number of persons per room	-	.05
8 Father's age	-	.03
<u>Schooling factor</u>		
165 Secondary school level	+	.19
166 Technical school level	+	.10
60 Years out of school	+	.07
<u>Job factor</u>		
64 Salary	+	.09
93 Schooling helps work	+	.09
<u>Behavioral - Attitudinal factor</u>		
136 Use French	+	.22
96 Job suited to ability	+	.06
119 Read Arabic newspaper	+	.05
86 Students fail because of family	+	.04
57 Teacher, reasons non-relative influential	+	.03
90 Skill, education necessary for stable job	+	.03

Source: Tables F.5 - F.8 in appendix F

Schooling and Alienation

To what extent does school shape students' attitudes and behavior in such a way that it alienates them from themselves and their society? We have shown, above, that schooling helps determine attitudes, a major step toward changing behavior. That schooling shapes behavior in both positive and negative ways has been well established in developed countries. And casual observation in developing countries confirms that schools encourage discipline, strengthen respect for non-family authority, and discourage creativity.

While our study was not designed to examine the question of alienation rigorously, we are able to review the data already presented in chapter 4 with it in mind. We will suggest that for some students alienation is a likely outcome of schooling. (For a discussion see Maccoby and Fromem (1970) and the School Boys of Barbiana (1970). That students who repeat grades in primary school are less modern than those who do not repeat, is evidence suggestive of a dimension of alienation.

A major finding in chapter 4 was that the family and personality characteristics of the rural boys who did well on Arabic were very different from those who did well on French. We saw that while family background was twice as important for predicting Arabic achievement as it was for predicting French, years of secondary schooling were insignificant as a predictor. In this section, we will suggest why there is such a split in the personality and background characteristics between the French and Arabic achiever. We will argue that the evidence for the division strongly points toward the influence of the French presence and culture. 1/

The historical antecedent for such an argument is clear. As stated by a French colonial administrator, "To the schools falls the task. . .of (giving) birth to this French consciousness as we may term it, and bringing to realization the small conquest which we ought hence forth to describe as a moral alliance" (Charton, date, emphasis added). The issue is whether or not this cultural conquest, aided by the schools, is still continuing almost twenty years after political independence.

The data shed light on questions that other writers have noted to be particularly acute in countries in which the elite is bilingual. Which culture is dominant? Which culture gets transferred by school norms in developing countries with a colonial experience and a widespread indigenous language? Is a synthesis of the cultures possible? Frantz Fanon (1967), for example, has documented extreme personality confusion under conditions of bicultural stress, while others suggest that the causes are endogenous to the culture (Mannoni, 1964). Is the synthesis more satisfactorily achieved with people from one particular income strata than from another?

It is a commonplace in Tunisia that the knowledge of French, both before and after independence, was increasingly felt by parents and students to be the sine qua non for upward social and economic mobility. ^{2/} The evidence in chapters 4 and 5 on the importance of the use of French in determining cognitive achievement levels, and in chapter 8 in determining earnings, supports this observation. Given this partiality to French, it follows that Arabic traditions would have been, except on political occasions, pushed deeper and deeper into the shadows of the modern society that the leaders sought.

While a direct attack on Arabic culture would have been politically unthinkable, it was implied. "When we attack underdevelopment in all its forms, we must return to the source, that is, to intellectual backwardness" (Brown, 1965). While the importance of Arabic was regularly proclaimed, primary school children started French in the third grade, receiving ten hours a week of Arabic instruction and fifteen hours of French through sixth grade. Without high scores in French, entrance to secondary school was impossible. Students quickly understood that if they did not continue to gain proficiency in French, they would soon be dropped from academic secondary school. Arabic was synonymous with "intellectual backwardness." Children could see films every two weeks in the village we studied, and they were in French. Adults films were twice a week and in Arabic. While some of the villagers accepted this stress on French, others may have rejected it consciously or not, or simply had strong Arabic ties which could not be weakened.

We would now like to review the evidence presented in chapter 4 to test the hypothesis that the Tadjerouine community is culturally divided, and that this division has more to do with the impact of French culture than with modern attitudes. What can we say about the families and the boys in an outwardly homogeneous community that in fact exhibits such a split? In what way, if any, have the schools contributed to the division? First, let us summarize the evidence for the existence of the division.

The major support for the hypothesis that the village of Todjerouine is culturally divided comes from the analysis in chapter 4 of the determinants of Arabic and French achievement; analysis by canonical correlation, in annex table 6.C. Substantiates this analysis of language achievement. Both analyses suggest that the family and the personal characteristics of the boys who do well on the French tests are very different from those of the boys who do well on the Arabic tests. When we examine more closely the individual characteristics of each group, we find several factors that consistently support the hypothesis of a cultural split, and none that does not.

First, we find that the less the organization experience, the better the boys do in French. Organizational activity is not significant for the Arabic achievers. Most boys in the sample do participate in the clubs, some less than others. Those that tend not to are a minority and thus exhibit poor social interaction, or social isolation. (They are not social deviants since, as far as we could determine, they are not labeled as different by their peers.)

Secondly, the boys who tend to do well on French do not like their schoolmates. This finding, which suggests a degree of alienation in the French achievers, reinforces the findings about non-attendance at clubs. Third, the high achievers in French deny that they are influenced by their fathers, another minority response. They claim some influence from siblings, but the less this influence, the better the French score. These two findings on sibling and father influence are consistent with the findings of social isolation described above. Given the three consistent findings and no evidence to the contrary, we would hypothesize that the greater the alienation that a boy feels, the better he will score on French reading comprehension tests.

When we turn to an examination of Arabic achievers, we find further data to support the assertion that there are greater differences than similarities between the Arabic and French achievers on the criterion of school achievement. First, we find that the family background variables are important in predicting Arabic test scores, while they were not for the French. An examination of these two variables--urban birth place, and urban visits of the mother suggests a consistent explanation for the boys' success in Arabic achievement. It is logical that the more the urban contact of the parents, the more the parents would have grasped the importance of education for improving the change of their son's having a better lifetime earning than they had. They would have observed more frequently than other parents that young men with more education tend to get higher paying jobs. While the parents of the Arabic achievers recognize the importance of French, they give learning Arabic higher priority. Parents without education or contact with French speaking Tunisians and with strong roots in the Arabic folk culture which ridicules foreign influence, would tend to reinforce their child's efforts in Arabic rather than French. The teachers, however, with their French training and awareness of the role of French in Tunisian occupational mobility such as their own, would tend to stress French. Furthermore, teachers have a pay incentive to get as many children as possible past the difficult exams. Thus the village dichotomy could be seen in terms of parent versus teacher influence rather than traditional versus modern.

While many factors probably contributed to the complaint that there was noise during homework period--including, for example, the presence of other children chanting their lessons, a large family, or a radio--nevertheless one could suggest, based on our family observations, that the parents thought that the more the lessons were chanted, the better the grades would be. Chanting is a typical classroom technique. Therefore, parents who placed the greatest importance on education would tend to encourage rather than suppress this particular noise, whatever their attitude about noise in other circumstances. Thus, a consistent case can be made for the parents of the Arabic achievers with their urban experience, thus eliciting a more positive attitude toward education. Parents then transferred this positive attitude into words and behavior that encouraged their children to learn better than children from other families.

A final point: it may seem that there is a paradox related to the findings on family background and those on student characteristics that relate to the Arabic scores. If we accept the explanation that the parents with a broader experience, especially urban contact, seem to have established a more positive learning environment than other families, and if we accept the explanation that the student characteristics indicate a bias toward Arab cultural tendencies, it might seem that these determinants pose a contradiction—the one modern, the other traditional. Yet, as we have indicated earlier, education is a strong Arabic cultural characteristic. So, that rather than working against one another, they could, in fact, mutually reinforce the achievement of the goal of an Arabic education.

These are the findings suggested from the data. To what extent are these corrections reinforced by forces exogenous to the families and the school? We have already referred to the importance that President Bourguiba has publicly placed on "removing intellectual backwardness." If members of his elite serve as cultural models of the modern Tunisian, then a knowledge of French is of the elite's distinguishing characteristics, perhaps the only one that is available in the countryside to most of the younger population.

While we cannot digress in a discussion of the role of language in conveying culture, suffice it to say that French as the language of the elite has a tremendous role to play in shaping non-elite cultural values. Evidence of the importance placed upon French by the non-elite comes from Morocco. There, when the independent government took French out of primary curriculum in a program of Arabization, the North African peasantry in the countryside erupted, charging an elitest plot to close their only avenue of social mobility. French was quickly restored. This example also reveals the insensitivity of some of the urban elite who, ironically, often themselves have rural backgrounds. A Tunisian example would be Ahmed ben Salah, ex-minister of the national economy, who supported an ill-fated agrarian reform program that ignored both the economics and the psychology of the present farmers.

In short, our survey data suggest that a cultural dichotomy exists, even in the villages, and that the split is associated with socially isolated behavioral patterns. Another observer (Gallagher, (19xx) reached similar conclusions, making a strong case of the potential for bicultural stress: "The complex grammatical apparatus of the classical language and the problem of its script are beyond the (early primary) age group. . . (and) there is an undeniable strain." Then the child is introduced to French. By the end of primary, the "most common complaint of teachers and observers is that neither language has been satisfactorily learned. Some teachers insist that intellectual and personal difficulties deepen early in the secondary cycle. The North African student often feels insecure linguistically. . . and (this) often compounds his difficulty by splitting his personality. . ." (pp.90-91).

Gallagher goes on to say that, "Since one of the most valid objectives of a bilingual, bicultural formation is to avoid splitting youth into two groups, one deracinated in terms of its own civilization and the other withdrawn into its cultural cocoon, it is necessary to insist on the phenomenon easily observable among many students, that the split may occur within the individual operates at a cost to himself" (pp. 92-93). Our evidence lends quantitative support to Gallagher's observations.

Autocolonialism or Development

It is important to state at the outset of any discussion of this question that the data on modernity, bicultural stress, and alienation are limited by the nature of the design of this study and the data from two communities.

The evidence of this chapter has tentatively suggested that the amount of schooling may play a significant role in determining student and worker behavior. What seems to be particularly important is the use of French outside the schools. Students and workers who have used their French extensively have higher levels of modernity than those who have more years of schooling, but who have not used their French as much. This is true for both the rural and urban groups.

Other non-school factors are important; they include both background and personality dimensions of the student. While there are some important differences between rural and urban students as to the effects of the non-school variables, nevertheless motivation, experience in an organization, and mother's education have strong effects on modernity levels.

The implications of the finding that the rural students are split between Arabic and French achievers depend on what the specific goals of education are. One set of goals might call for selecting, those boys who have an aptitude and motivation for French, with the intention of preparing them for elite positions. In contrast to popular belief, however, the data suggest that this preparation probably takes place more at home than at school; the socially isolated behavior of the French achievers implies that they are socialized very differently from their peers. ^{3/} If however, it is not a goal to produce an isolated Frenchified elite, then one can question that part of the educational investment that has fostered the development of an elite.

If Ahmed ben Salah, a son of the countryside who was insensitive to rural processes and needs, is representative of this elite, then the psychological and economic costs of such an educational policy, in his case alone, were high. Was he an exception, or just culturally similar to thousands that the still-colonized culture may be producing? ^{4/} If the finding is correct that the community is culturally split and that schooling deepens the split, then educational policy needs rethinking. While our evidence is only indirect, it does suggest that the Tunisian form of biculturalism is contributing to both autocolonialism and development.

ANNEX TO CHAPTER 6

Further analysis of Modernity and achievement

The simple correlation of modernity and the achievement scores is significant for three of the six possibilities, as shown in annex table 6.A, below. But the regression equation in the annex to chapter 4 indicates that modernity is not significant the other determinants are controlled.

ANNEX TABLE 6.A

Modernity and Student Achievement Scores

<u>Urban (n88)</u>	<u>Correlations with Modernity</u>
Arabic	.18
French	.34 **
Arithmetic	.34 **
 <u>Rural (n44)</u>	
Arabic	.35 *
French	.15
Arithmetic	.00

* P .05

** P .01

To confirm the hypothesis that modernity does not contribute to achievement, we carried out one additional test. Because of the significant correlation of secondary school attendance with modernity for the rural sample, secondary could be serving as a proxy for modernity. Removing secondary from the equation would test for this possibility. Annex table 6.B gives both the original equation (1), and then the equation with modernity removed, equation (2). The results show that when secondary schooling is removed, modernity is still not significant. Modernity, therefore, could not be an input for higher achievement. (This is tested only for the French equation, because no schooling variables were significant in predicting Arabic.) A similar test was made for the urban sample where schooling dimensions were significant in predicting both language achievement scores, and modernity was not a significant determinant.

Annex Table 6.B

Modernity as Input to French Achievement of Rural Students

Dependent Variable: French Achievement

<u>Independent Variables</u>	<u>Equation 1 /2</u>		<u>Equation 2 /2</u>	
	<u>Beta</u>	<u>R</u>	<u>Beta</u>	<u>R</u>
Siblings Influence	-.38		.36	
Socioeconomic status	.23		.25	
Years secondary	.45		Removed	
Organization experience	-.30		-.32	
Suitable job	(-.17)		(-.12)	
Mass media			(.11) *	.38
Need achievement			(.19)	
Modernity			(.15)	
Urban Travel			(.08)	
Association with French			(.06)	

Note: * The t score is not significant (p. .05) for any of the Betas bracketed ().

Canonical Correlation

The results in annex table 6.C show a highly significant correlation in the first canonical variate set which is caused by the contributions of the amount of schooling in predicting the French score and the frequency of TV in predicting the Arabic scores. Logically, this makes sense since a person's ability in French is mostly a result of his schooling in French, and a person's Arabic achievement increases the more he is exposed to Arabic—hence, the more TV exposure, the higher the Arabic achievement.

From the second canonical correlation we see that there is no longer a significant linear dependence (canonical correlation .54 (p. 05), and for the third and fourth - .398 and .180 respectively).

We conclude that once the direct causes for high achievement on language scores (i.e., schooling and frequency of TV are minimized, we have two very independent clusters of variables acting to predict the French and Arabic scores.

Footnotes

- 1/ While quantitative literature is virtually absent, historical sources give the policy perspective. For a review of the French policy in Tunisia, see Marie Montamat (1969).
- 2/ Little research has been done to support this feeling. Certainly if the linguistic abilities of the members of the Tunisian national assembly are any indication, French is not indispensable for entry into the establishment. Furthermore, many individuals have competence in French, but will not enjoy upward social mobility. Allman (1972) presents Tunisian evidence from three lower-income communities, both rural and urban, showing a near zero net upward mobility.
- 3/ This hypothesis is consistent with Hagen's view (19xx, p.), on minority roles in achieving economic growth.
- 4/ A basic question to ask in future research about these individuals is whether or not they may have the characteristics of latent innovators (see, for example, Hagen, 1962, p. 34).

Chapter 7

Retention of Cognitive Skills Acquired in Primary School*

John Simmons

In the education process, the development of cognitive skills is emphasized with the idea that they will further economic and social progress. How far pupils manage to retain or improve these skills once they have been acquired is a question that is seldom discussed, even though loss of skills is an important aspect of the depreciation of human capital. On the rare occasions when the subject of cognitive retention does arise, one of two assumptions is commonly made: that once cognitive skills are learned in school, either they will be retained without difficulty by all students, or that, at the least, they will be retained by those students who go on to secondary school. It is also argued that even primary school pupils who subsequently lose their skills, and had probably learned little in the first place, or who had no incentive to practice them later, still received some benefits from their schooling through the socialization process. Our purpose is both to explore the extent to which individuals with six grades of primary schooling improve or decline in their cognitive abilities after being out of school for some time, and to suggest several reasons for the variance in retention.

Using data from an urban sample of Tunisian workers aged 15-25, we will argue that the loss of cognitive abilities is so serious that about half the primary school graduates have relapsed into either semiliteracy or illiteracy when tested after several years out of school. We will also argue that the length of time they are out of school is not a significant predictor of their ability to retain what they learned. Rather, a number of background factors - mainly relating to the home environment and personality - are significant in explaining the variance in retention of cognitive skills.

First, we will review the quantitative literature on retention in some detail, since such a review is not available in the literature and the studies are relatively inaccessible. Secondly, we will discuss the hypotheses and the sample characteristics, and review the measures of retention. Thirdly, we will analyze the background variables in their relation to retention. Finally, we will discuss the implications of the results.

A Review of the Literature

The empirical work on literacy retention is sparse. Limitations in the design of existing studies have further restricted their value as contributions to understanding the subject.

There are four major factors that might be usefully examined in studying the reasons for retention of literacy: the individual's education, personality, family characteristics, and post-school environment. First, the quality, as well as the quantity, of education is important. For participants in adult education programs, this means looking at the length and intensity of the program. Where primary schooling is concerned, it is particularly important to distinguish between years spent in school and grade levels completed, and thus be able to separate the person whose six years' education got him only as far as grade three from the one who by the end of six years had finished the sixth grade. It cannot be assumed that reaching a particular grade level means that a student is literate. Consideration should also be given to quality of schooling, although its impact on most schooling outcomes seems to have been minimal. ^{1/} This could include student/teacher ratios, teacher training, school facilities, and curriculum. Finally, aspects of the individual school experience such as attendance, academic achievement, and time out of school require attention.

The second factor relates to such individual traits as age, intelligence, and noncognitive personality characteristics including attitudes toward change, levels of motivation, and aspirations. Memory tends to be an intervening variable, not casual. The third factor concerns family characteristics: socio economic status (as reflected in income and occupational status) as a proxy for past behavior, living conditions, intra-family relationships, educational level of other family members, and extent to which home atmosphere is learning-conducive. The fourth factor is related to the circumstances in the home or on the job in which the "new literate" finds himself when he leaves primary school or literacy training.

Measurement of cognitive skill levels upon termination of literacy courses or primary school is essential for studying retention. Ideally it is essential to test the subject's level of skill immediately after he leaves primary school or completes a literacy course. This measurement will avoid confusing the person who has lost his literacy skills with the one who never mastered any in the first place but got through school. Fifty-three percent of seventh-grade-passing students in the United States who then stop their schooling were considered functionally illiterate in 1967. ^{2/}

The definition and measurement of literacy are poorly covered in the literature. Few studies provide realistic quantified estimates. ^{3/} One should note that an individual's cognitive abilities are only partially measured by the achievement tests commonly administered in schools. The tests of literacy often include the response to the census question of "Have you been to school?" (or to the n grade of school), the reading aloud of a sentence, or writing dictated phrases. With rare exceptions, they do not test reading comprehension. ^{4/}

We now turn to a review of the five studies that seem to compose the literature on retention.

The earliest of the retention studies is reported by A.L. Tibawi in his historical assessment of education in Palestine under the British in 1932. 5/ Using a sample of 902 men from 54 villages who had left school for some time and a test that included reading comprehension, Tibawi found that the older the respondent and the less schooling he had, the lower the test score. The sample averaged five years of schooling. For the old men in the sample 53 percent were illiterate in Arabic, and for the younger men only 24 percent. Tibawi assumed that this represented a significant decline in retention. Unfortunately there was no test of the samples' ability when they left school. In a second sample of 40 urban women who had four to five years of education, and who had been out of school five to eleven years, Tibawi found that they had all lapsed into illiteracy.

Another study in the Satara district in India in 1942 by Gadgil also examined retention. 6/ The sample included 2,678 men who had been out of school from five to thirty years and had reached at least third grade before leaving. The reading test was weak since it asked the respondent to read aloud any one of three passages from a series of recent government publications specially designed for new adult literates. Reading aloud does not indicate comprehension of what is read. Furthermore, there was no baseline test when they left school.

Gadgil found that the tendency to lapse into illiteracy was inversely related to both years spent in school and grade level reached. For example, the literacy rate for men with primary II (second grade) was 67 percent, while with primary IV it was 97 percent. Within each grade, the loss of skills also became less likely as age at the time of leaving school increased. Quality of education did not seem to affect the retention rate; neither one-teacher schools nor lack of teacher training appeared significant.

The study explored other variables associated with the lapse into illiteracy using simple correlation analysis. Gadgil found that the tendency to lapse was greatest during the first five years out of school, among workers with the lowest earnings, and among those who came from the largest villages. Retention had no relationship with village contact with the outside as measured by presence or absence of a post office, distance to the nearest road or railroad, or periodic migration. Finally, Gadgil found that even among the literate, few used their cognitive skills.

While these findings are interesting, they do not provide much policy insight. They did not use a baseline measurement of literacy, nor was the test sufficiently rigorous to measure newspaper reading ability, which is thought to be a minimum level for functional literacy. Finally, the associated variables are not controlled for the effect of another variable on retention, nor for important background variables like parental education or income.

In 1966 Greenleigh studied 1,600 recipients of welfare across three states in the United States. 7/ They had all participated in a seventeen-week adult education course, and the majority were over thirty years old. While 68 percent had completed at least five grades of school, the entire group scored below the fifth-grade level on the pre-course reading measure, and were hence considered functional illiterates at the beginning of the course. By the end of the course the mean reading level had risen from third grade to nearly fifth grade. When the same test was readministered six months after completing the course, reading levels had begun to drop. After twelve months the drop was more pronounced, but the mean was still a net gain of one grade level over what it was when they finished the course. The range was wide however; 15 percent were reading at eighth grade or better and 19 percent were still below the fifth grade.

Greenleigh explores the variables associated with retention. It was not affected by either of the three different reading systems that were used, nor by level of teacher qualifications, which included high school graduates and certified teachers. The greatest gains in reading were made by those who became employed. Post-course involvement in further education or training programs did not significantly affect their retention. The control group, which had not had the course, also increased their reading ability and retention over the same period. Finding employment was a major reason. The study concluded that the adult education courses of the type evaluated were "not of long-run educational value."

A study by Smith in Rhodesia with 18 farmers attempted to determine the effect of teaching the 85 reading lessons of the first grade of primary school. 8/ The farmers were given a sample literacy test at the end of the course, and thirteen of them were then retested after six months. Smith concluded that they had been able to maintain their skill in reading but not in arithmetic.

A Tunisian study by Simmons and Allman in 1973 tested a sample drawn from 757 Tunisian villagers who had from two to three years of functional literacy as part of adult education. 9/ Baseline data were compared with a follow-up test one to two years after the villagers had finished the course. It was found that about 75 percent had declined from the level they had reached on finishing the course. Further testing showed that 80 percent were illiterate, 16 percent semiliterate, and only 4 percent could read and understand passages from a national newspaper.

The factors associated with retention were examined by tests of simple correlation. Simmons and Allman found that high test scores were correlated with amount of previous education, socioeconomic status, and use of literacy. The scores were not related to the years spent taking adult education, use of radio and TV, attendance at the movies, contact with urban areas, or participation in local organizations.

J.M. Kapoor and Prodipto Roy examined literacy retention in India using a sample of 630 adults. ^{10/} The sample had completed either six years of schooling or literacy classes between 1958 and 1966, when tested for retention in 1968. The tests measured reading comprehension, as well as writing and arithmetic. They found that 45 percent of those adults who had literacy classes had lost their skills, while the school leavers lost 20 percent of their skills. Among the school group rural students had higher retention than urban.

In sum, what can we generalize about these studies? First of all, as we have said, their number is amazingly small in view of the importance of the subject. Comparability is minimal; the studies reviewed above do not share the same definition or measure of literacy, let alone have in common independent variables other than amount of schooling. They also suffer from serious defects in design. With the exception of the Greenleigh study, they lacked control groups. Definition and measurement of independent variables tended to be so imprecise as to make evaluation of their role extremely difficult; even with regard to previous education, "grade level completed" vs. "years spent in school" were not adequately distinguished from each other. The analytic procedures of cross-tabulation and correlation did not permit controlling simultaneously for important background variables like age, socioeconomic status, and previous schooling. Another crucial weakness was the failure to clarify initial skill levels; only the Greenleigh study obtained thorough baseline data against which retention over time could be compared.

With these caveats in mind, we summarize the results. First, the studies consistently indicate a decline in literacy skills over time - with the exception of the Rhodesian research, where the only loss was in arithmetic ability. Second, high levels of previous education are not a guarantee that people will not lapse into illiteracy. Previous educational levels ranged from some adult literacy training to complete primary. The lowest levels of schooling seem to impart very little that is retained. Third, the tests of comprehension show that even what is retained appears to have little practical value to the individual or the society.

The Approach

Our purpose was to test a model with factors that are theoretically significant in predicting individuals' loss or gain (retention) in cognitive skills after they had left school. The causal model of these factors takes the following form:

Each of the factors in the model will be represented by several dimensions when the model is tested. The dimensions were chosen on the basis of the significance in earlier studies on the determinants of cognitive achievement in developing countries. ^{11/} It was postulated they would also be significant in studying retention. For the schooling factor we should note that the sample was chosen to act as a control for the grade level of the respondents. They had all attended sixth grade. Furthermore, we did not measure the quality of their schooling, for example, teacher qualifications or expenditure. Based on the previous research we would not expect quality to be a significant factor. Thus other dimensions of schooling such as "grades repeated" and "age at entry" are explored. Family characteristics include an index of socioeconomic status, as well as a measure of parents' exposure to mass media and religiosity dimensions. Personality attributes of the students include measures of their attitudes toward school and relations with their peers. The oversimplified diagram hides many of the possible interrelationships.

Two basic approaches are possible when examining the retention of cognitive skills in a population that has been out of school for a period of time. They are the comparative cross-sectional approach and the longitudinal. The longitudinal approach measures the individual's level of cognitive achievement when he leaves school, and then measures him after a passage of time on the same test. The results would be scored for his gain or loss. The comparative cross-sectional approach, which this study used, takes two samples at the same point in time, one finishing school, and the other out of school. Both are tested for cognitive levels and interviewed for background variables to control for possible variations in the populations. The mean score of the in-school group becomes the baseline for measuring a gain or a loss for the individuals who have been out of school.

Two assumptions are basic to the cross-sectional method: that the quality of neither schooling nor students has changed over time. We are unable to control for the first assumption - no change in the quality of

schooling - although we can make some observations on possibilities. The second assumption - no change in the quality of the students - is also difficult to control for. If we consider student quality to be a bundle of dimensions including intelligence, motivation, attitudes, behavior, and family background, then we can only begin to control for these possible differences with some of the interview data on attitudes and family background. Given the lack of information on both of the assumptions, it is useful to speculate for a moment on what may have happened over time to the older population.

Throughout Tunisia there are more primary age children than there are places available for them in school. Five years ago, when the older of our two populations was in school, school places were even more scarce. How were children picked to get these places? Self-selection probably played an important role, since some parents were not convinced of the importance of education, or lived too far away for their children to walk to school. More recently, additional schools have been built, and more families have moved closer to villages and cities to take advantage of the schools. The motivation a student requires to get to school, and then to stay there, was probably greater ten years ago than it is today. Furthermore, as the proportion of low-income families with sons attending school increased, their children, as compared with children of higher-income families, would tend to do less well at school; the more education-oriented attitudes and behavior of the higher-income groups would tend to assure this result.

This speculation about the differences between our baseline population and the older population is important for interpreting the results. Both the above points about change in the quality of the schooling and the students indicate that the measured loss of cognitive skills will underestimate the true loss. Specifically, assuming the points are correct, baseline scores would be higher if they had been taken ten years ago. Thus, if a worker shows a significant improvement in the score over the baseline measure, we should adjust it downward to correct for the quality bias. If a worker showed that he lost ground relative to the baseline measure, the correction for the quality bias means that the average worker's true score was even worse. Thus, the estimates we will report are biased in favor of retention.

The sample respondents were drawn from an urban community on the outskirts of Tunis, La Goulette. The sample frame was based on the quality of housing to assure respondents from all socioeconomic groups and was checked for representativeness with the census. Respondents' ages ranged from 15 to 25. They were interviewed and tested, and their fathers were interviewed for family background data.

To test this model, the sample included one group that was still in the sixth grade - comprised of the baseline group, and those who were out of school but who also had only reached the sixth grade. This criterion limited the out-of-school group to 24 and the baseline group to 13. Thus "years of schooling" were not a variable for either the baseline or the worker group. Because the number for the baseline group was small, their scores were verified by sampling several classrooms of sixth-graders in the same community.

The out-of-school workers stopped school after six grades. Some of the baseline group will go on to more schooling. Thus a truly comparable baseline measure would have selected only those not going on to more schooling. The baseline scores are therefore biased upward.

While a small sample limits the extent to which the results can be generalized, this was intended as a pilot study, not a comprehensive survey. It was designed to explore a wide range of possible variables rather than to specify more accurately a small number of variables by using a larger sample.

The French and Arabic achievement tests were scored 0-6, and math 0-5. Scores of 5-6 on French and Arabic indicated an ability to read and understand national newspapers, a score of 3-4 included an ability to understand simple sentences and vocabulary, defined as semiliterate, and a score of 0-2 meant that at best only a few words could be understood and was defined as illiterate. For math a score of 3 or less meant an inability to use either simple multiplication or division. Several measures of retention were estimated, and the results are presented in the text. The mean scores for the tests are presented in Table 1. All three tests are consistent in suggesting a loss of retention of one group compared to the other. The average worker declined from literacy to semiliteracy.

TABLE 7.1

Mean Test Scores

	<u>In School (n13)</u>	<u>Out of School (n24)</u>	<u>Loss</u>
Arabic	4.3	3.6	0.7
French	4.2	3.8	0.4
Math	3.8	3.3	0.5

We calculated the differences for each individual rather than the group, to determine how he compared to the in-school baseline scores in the three achievements tests. For each of the three tests the differences, or rates of retention, were categorized four ways. First was the loss measure, where workers whose scores showed an improvement over the baseline were coded 0, and those whose scores showed a decline were given a score indicating points lost compared to the baseline. Second, a similar measure was computed for gains which were defined by points scored compared to the baseline. Third, a dichotomous variable was defined to include the workers who were unchanged or improved in one category, and the workers who had declined in another. Fourth, a final measure was computed from the sum of the dichotomous measures of retention for Arabic and French.

The measures in Table 2 show that about as many workers improved as declined in each of the three cognitive skills measured. They indicate that 42 percent of the workers did not suffer a loss of their Arabic ability, while 58 percent did lose, including 6 percent who suffered complete loss of Arabic ability. For French achievement, 50 percent did not decline, while 25 percent regressed to no measured ability. Math loss, while similar in pattern to the other two, showed slightly less loss at each level. The data on gains show the workers who improved most in math with a gain of 54 percent, in Arabic 42 percent, and in French 50 percent. The dichotomized scores for the measures are summed to measure "retention." Thus 33 percent of the sample declined on both the Arabic and French tests, while 42 percent improved on one but not the other, and 25 percent improved on both tests.

While the design has significant limitations, it is better than virtually all of the previous studies that lacked control groups. Of course, our cross-sectional control is inferior to a longitudinal one.

Table 2

Retention of Cognitive Achievement
(% of n24)

a. <u>Loss</u>	<u>Low</u> <u>(0)a</u>	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>High</u> <u>(4)</u>
Arabic	42	13	13	8	6
French	50	17	4	4	25
Math	54	17	17	8	4
b. <u>Gain</u>	<u>Low</u> <u>(0)a</u>		<u>(1)</u>		<u>High</u> <u>(2)</u>
Arabic	58		21		21
French	50		42		8
Math	46		29		25
c. <u>Retained</u>		<u>Loss</u> <u>(0)</u>		<u>Gain</u> <u>(1)</u>	
Arabic		58		42	
French		50		50	
Math		46		54	
d. <u>Retension of Reading</u> <u>Comprehension</u>		<u>Loss on one</u> <u>(0)</u>	<u>Loss on one</u> <u>Gain on one</u> <u>(1)</u>	<u>Gain on</u> <u>both</u> <u>(2)</u>	
Arabic & French		33	42	25	

Notes: When Arabic, French and math were summed, 25% had a loss on all three, 21% a gain on all three, and 54% had both losses and gains.

a. Because the baseline scores were not integers, and the workers' scores were, it was possible to score only a gain or a loss.

b. The "combined retained" scores are the sum of the scores in the "retained" table. Thus 33% scored 0 in both Arabic and French.

Factors in Retention

What are the factors that cause some workers to enhance their cognitive abilities and others to lose them? A model of the theoretically important factors was given in diagram 1. To represent each of these factors, several theoretically important dimensions were chosen. Each set of dimensions was entered into a stepwise linear regression predicting retention. A list of these theoretically important dimensions is presented by factor in Table 3 with their standardized beta and zero order correlation coefficients.

To simplify the interpretation of the results, we examined the possibility of combining the dichotomized variables of French and Arabic retention into one index of retention. The zero order correlation coefficient between the two was sufficiently high ($r = .80$) to suggest that they could be combined. The near normal distribution of this combined variable, presented in section d of Table 2, supports this decision.

The data in table 3 show the results of the regression equations. They indicate that each factor has at least one dimension that is significant at normal levels of probability in predicting retention.

The dimensions that are significant hold few surprises. Economic status of the family (SES), is not significant. Better measures of those family attributes more closely related to cognitive achievement, such as religiosity and mother influence, are significant. While everyone in the sample had only six grades of primary, there were differences among the respondents on other schooling dimensions. A significant dimension was "changed schools," which refers to boys who had started school in the countryside and moved to the town. Most of the dimensions for the last two factors - personality and use of cognitive skills - have a theoretical justification for their significance. The boys who replied to the question, "What would you do to make your school better if you were the director?" that they would like to see an improvement in the school facilities, are highly correlated with reading retention. It is unclear what the dimension is measuring.

The boys who left school because of bad performance, i.e., low cognitive achievement, would be expected to have lower reading retention than those who had higher performance. Note that the two scales measuring attitudes - need achievement and modernity - are not highly correlated to retention of primary education.

Finally, we would expect a reinforcing relationship between mass media exposure and retention, but were surprised to see that other dimensions of the use of cognitive skills were not significant.

The significant dimensions for each factor were then combined in one equation to test the full model of retention. The results, in table 4, suggest that three factors are represented, and each by only a single dimension. The personality factor was not significant. The family background dimension suggests the importance of religiosity in the home, at least as characterized by the presence of some member praying, for high retention. Mass media exposure, which included newspaper reading, radio listening, and TV viewing, was the second significant dimension. How media exposure affects retention is unclear; perhaps it does so by creating awareness, which would encourage use of cognitive skills.

The students who changed primary school had higher retention. These are students of migrant families, most of whom started primary in the Sahel area on the southern coast before moving to La Goulette soon after independence. Thus, this variable could be interpreted as a proxy showing that students had higher-quality instruction before they moved, that miserable conditions forced them to leave, or that the move to the city demonstrated that the family had high motivation for success. The last may be the most plausible explanation. This dimension might have best been considered under the family background factor.

Table 3

Dimensions of Cognitive Retention
(n 24)

Dependent variable: Retention of Reading Comprehension.

<u>Family Background Factor</u>		<u>Beta</u> ^{1/}	<u>r</u>	<u>R²</u>
40	Socio economic index		.11	
31	Mother supervises education	.49	.32	
29	Someone in family prays	-.54	-.48	
75	Son had assistance on homework		-.19	
68	Mother a major influence	.30	.30	.50
Variance (for significant Betas only)				
<u>Schooling Factor</u> ^{2/}				
164	Years Kuttab		-.13	
47	Primary grades repeated		.10	
60	Years since school		-.42	
48	Changed schools	.54	.54	
46	Age entered school		-.14	
Variance (for significant beta only)				.30
<u>Personality Factor</u>				
42	Age		.02	
85	Improve School facilities	.47	.54	
61	Improve aid to poorer students		.06	
73	Noise and problem for homework		.19	
92	High job aspirations		.37	
99	Advantages of job: personal		-.22	
83	Student to blame for own failure		.19	
133	Modernity scale		.19	
137	Need achievement scale		.33	
58	Left school because bad performance.	-.37	-.46	
Variance (for significant Betas only)				.42
<u>Use of cognitive skills</u>				
134	Mass media exposure	.51	.51	
109	Speaks French		.39	
125	Write French letter		.45	
136	Associated with French scale		.40	
124	Writes Arabic Letter		.41	
93	School helps work		-.10	
114	Participation in organization		-.14	
94	Work requires reading & writing		-.26	
135	Use of education scale		.35	
Variance (for significant Betas only)				.26

Note: 1/ Beta is the standardized regression coefficient and is significant at the .05 level of probability.

2/ Since all 24 subjects had 6 grades of primary, school grades do not constitute a variable in this factor.

Table 4

Factors Related to Retention
 Dependent Variable: Retention of Reading Comprehension

Independent Variables	r	Beta	t	x'x
48 Changed schools	.54	.39	2.26	1.00
134 Mass media exposure	.51	.19	.99	1.00
29 Someone in family prays	-.48	-.35	-2.10	.90
85 Desires improvement in school facilities	.54	.23	1.50	.65
31 Mother supervised education	-.32	.15	.89	.44
58 Left school for bad performance	.46	-.18	-.09	.23
68 Mother a major influence	.30	-.01	-.01	.15
constant		.30		
R ²		.73		
F for equation		6.13		
n observations		24		

Notes: 1) Significance levels for the two tailed test:

when $t = 2.06$ $P < .05$;
 when $t = 1.71$ $P < .10$;
 when $t = 1.32$ $L < .20$.

- 2) x'x is a measure of multicolliniarity.
- 3) Beta is the standardized regression coefficient.
- 4) r is the zero order correlation coefficient.
- 5) See Appendix Tables 1 and 2 for the statistics and the variables.

The R^2 for the significant variables is 73 percent; thus the unexplained residual is 26 percent which is low for cross-sectional data. Still, the residual suggests that important dimensions may be lacking. There are a number of possibilities. While we know that physical disabilities among students reduce learning potential, we did not test, for example, for dyslexia, deficient eyesight or hearing, or subnormal brain size. Nor did we attempt to measure the relative genetic endowments which may have been significant for intelligence levels. A factor that is not shown in diagram 1 and one which undoubtedly had an influence on the individual cognitive retention was luck - not randomly distributed across the sample. Other dimensions of the family background factor could have included the measure of the parents' verbal ability and measures of interaction with their children.

Summary and Implications

The urban sample aged 15-25 all had six grades of primary, which for some, because of repeating, meant as many as ten years of schooling, excluding additional time in the kuttab.^{12/} The results of our study suggest three major conclusions. First, the loss in cognitive ability, as measured in tests of reading comprehension, is clear. For the sample 33 percent declined in both Arabic and French, compared to the reference point. Forty-two percent gained in one and declined in the other, and 25 percent gained in both. And in French, 25 percent incurred total loss. Given the biases in the measurement, the actual declines would have been greater and the gains less.

Second, several of the factors considered to be theoretically significant in explaining the gain or less of cognitive abilities over time did prove to be so. These factors included family background and exposure to mass media.

Third, some dimensions hypothesized to be significant predictors of retention were not. These included years spent in the kuttab in addition to primary, the number of times primary grades were repeated, and the length of time that had elapsed since the individual had left school.

Our conclusions are tentative, since both the design of the study and the individuals who were sampled restrict the breadth of useful generalization. Specifically, using the comparative cross-sectional method to measure change in cognitive skills over time is not as good as having observations on the same individual over time. Also we controlled for the amount of primary schooling the sample had, which meant that we could not examine possible threshold amounts of schooling that might have been important for significant increases in retention. Finally, the universe limited the sample to boys from low- and middle-income urban families. We can draw little inference about other groups such as girls, rural individuals, or upper-income workers. Even with these shortcomings, however, our approach represents a significant improvement over the existing literature.

What are the implications of these results for educational policy and future research? First, the permanent effect of primary education in Tunisia for all students completing 6 grades - and even for those having up to 10 years of primary school - has to be questioned. Thus, a primary school certificate is neither a guarantee that students have reached an adequate level of literacy, nor that they will retain what they have learned.

Second, we were not testing an individual's ability to remember facts, but rather to use skills - reading and arithmetic - that are basic to further formal education. Most facts learned in primary school are usually forgotten, but we have usually assumed that the basic skills are not. Yet the results imply that some individuals who were able to read and understand national newspapers on leaving school could not do so several years later.

Third, the reason that some individuals retain more than others appears to be more a factor of family background and post-school use of cognitive skills than it is a factor of the school experience. 13/ Thus attempts to understand retention should concentrate on the non-school influences, while not ignoring schooling.

FOOTNOTES

- * Comments on an earlier draft by Samuel Bowles, Zvi Griliches and the reviewers were helpful. This research was supported by USAID/Tunis, the Harvard Center for Studies in Education and Development, the Harvard Center of Middle Eastern Studies and the World Bank. It is a part of a larger study on education in Tunisia by the author. The research assistance of Russell Beirn and Lew Koppel was appreciated.
- 1/ The UNESCO literature in the 1950s on literacy and primary education asserts that four years of primary education equals literacy. For evidence that at least in one country eight grade levels are a minimum for getting majority to literacy, see John Simmons, "Effectiveness of Schooling: Tunisian Primary and Secondary School Students" (Washington, D.C.: World Bank, May 1973). For a review of the international evidence on the impact of the quality of schooling on learning see John Simmons, "How Effective is Schooling in Promoting Learning: A Review of the Research" (Washington, D.C.: World Bank, Staff Working Paper, May 1974).
- 2/ David Harman, "Illiteracy: An Overview," Harvard Educational Review May, 1970, p. 230.
- 3/ For a review of these measures and an attempt to establish and apply a comprehensive definition, see John Simmons and James Allman, "Education des adultes et niveau d'alphabetisation dans un village Tunisien," Revue Tunisienne de Sciences Sociales, Mai, 1973.
- 4/ For examples of the exceptions, see John Simmons with Sumru Ekrut, Schooling for Development? Students and Workers in Tunisia (Cambridge, Mass.: Department of Economics, Harvard University, 1972).
- 5/ A.L. Tibawi, Arab Education in Mandatory Palestine: A Study of Three Decades of British Administration (London: Luzac and Company Ltd., 1956).
- 6/ D.R. Gadgil, "Report of Investigation into the Problem of Lapse into Illiteracy in the Satara District" in Primary Education in Satara District: Reports of Two Investigations (Poona: Gokhale Institute of Politics and Economics, 1955).
- 7/ Greenleigh Associates, Inc., Participants in the Field Test of Four Adult Basic Education Systems: Follow-Up Study (New York: Mimeo, January 1968).

- 8/ Smith, G.A.: "A Micro-study of Rural Illiteracy in the Tribal Trust Lands of Rhodesia, Evaluation of Chiduku Literacy Project." (Salisbury University College of Rhodesia, Institute of Adult Education, July 1970).
- 9/ John Simmons and James Allman, op. cit.
- 10/ J.M. Kapoor and Prodipto Roy, Retention of Literacy (New Delhi: Council for Social Development, 1970).
- 11/ John Simmons and Leigh Alexander, "The Determinants of Cognitive Achievement in Developing Countries: A Review of the Research" Economic Development and Cultural Change (forthcoming, 1976).
- 12/ Repeating grades for this sample is not a significant predictor of achievement for either French or Arabic. For math, repeating was negatively associated with achievement: the more years repeated, the lower the score. John Simmons with Sumru Ekrut, op. cit., Chapter 4.
- 13/ The study did not attempt to explore the full range of school variables, including teacher quality and other inputs. Previous research suggests that these are not likely to be significant as suggested in John Simmons and Leigh Alexander, op. cit. Furthermore, the school taught affective skills appear to be more important for high lifetime earnings than the cognitive skills as indicated in Herbert Gintis, "Education, Technology and the Characteristics of Worker Productivity," American Economic Review May 1971 and John Simmons, "The Determinants of Earnings: Towards an Improved Model" (Washington, D.C., World Bank, Staff Working Paper, March 1974).

Appendix 1

Statistics
(n24)

<u>Var.</u>	<u>coded</u>	<u>mean</u>	<u>stdev.</u>
29 Someone prays	0,1	.36	.50
31 Mum supervised educ.	0,1	.42	.50
48 changed schools	0,1	.33	.48
58 Left school	0,1	.79	.42
85 Improved school facilities	0,1	.42	.50
134 Mass media	0-6	4.08	1.35
177 Retention of reading	0,1,2	.92	.78

Note: The coding assigned the low value to a negative response, and a high value to a positive response. Mass media is a scale including radio and TV exposure, more attendance and newspaper reading.

Appendix 2

Zero order correlations coefficients
(n24)

<u>Var.</u>	<u>Var</u>	<u>Var</u>	<u>Var</u>	<u>Var</u>	<u>Var</u>	<u>Var</u>	<u>Var</u>
29 Someone prays	(29)	(31)	(48)	(58)	(85)	(134)	(177)
31 Mom supervised		0.218	0.0	-0.026	-0.480	-0.310	-0.482
48 Changed schools			0.478	-0.191	-0.029	0.139	0.315
58 Left school				-0.290	0.120	0.022	0.543
85 Improved school					-0.191	-0.589	-0.462
134 Mass media						0.331	0.538
177 Retention of reading							.506

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Chapter 8

Schooling and Earnings

Economic analysis uses several techniques to examine the relationship between education and development. The most widely used method attempts to relate individual earnings to the amount of schooling an individual has had. This chapter reviews several types of earnings analysis, and then tests the traditional models with the data from our survey of workers. We will argue, however, that the traditional models inadequately specify the major dimensions of earnings differentials. Because of this misspecification the traditional models overestimate the return to schooling. Using an improved model, we find that schooling is not as significant a determinant of earnings for low- and middle-income young workers as we had expected.

Tunisia is an eminently suitable country in which to test the applicability of these models to an important groups of developing countries. The Tunisian national income per capita of about three hundred dollars indicates the increasing importance of the quality of the work force to promote continued structural change of the economy. The post-World War II emphasis on education, which was accelerated by programs after independence (1956), has provided significant numbers of urban and rural workers who have primary and often further education. Thus the economic, industrial, and educational development that Tunisia has achieved today represents the goal that many other developing countries hope to reach in the next decade or two.

Previous Research

Rate of return analysis has the great advantage of producing one figure that estimates the discounted present value of net benefits. The disadvantages, particularly for policy planning, lie in the assumptions used in calculating the figure. Serious bias in rate of return estimates come from several sources, including those benefits from education that are not measured by an individual's earnings. There are two general types of such externalities. First are the benefits from education that accrue to the worker outside his job - for example, the ability to write his own letters rather than paying someone to do it; second are the benefits that accrue to the people around him, both workers and family, because of his assistance. Both these types of unmeasured benefits are economic. Furthermore, there are non-economic benefits from education - life styles, foexample, and the pleasure of learning, and social status. These non-economic results are often mistakenly termed "consumption benefits," although they are actually a flow of services resulting from the original educational investment. 1/

Another serious bias in rate of return studies is that the earnings differential among different amounts of schooling is viewed as the productivity effect of the additional education. In fact, recent reviews of the literature by Berg (1970), Collins (1971), Gintis (1971), and Jencks et al. (1972) suggest that this is a misleading oversimplification: behavior of the worker's parents and characteristics of the worker's personality, for example, may contribute more to the individual's earnings ability than his years of schooling.

There are several other problems when rate of return is used for data analysis. Most studies do not correct the lifetime earnings estimates for the probability of unemployment, absenteeism, or life expectancy. When Selowsky (1968) adjusts his estimates for these factors using Colombian data, the rates of return decline up to 50 percent, with the highest declines coming at the primary school level. Blaug, Layard and Woodhall (1969) estimated adjusted rates which show comparable declines for India; "almost all educational investment (in 1960) falls below the alternative social rate of return (p. 233).

Another problem is that the analysis assumes that the observed wages used for earnings reflect the marginal productivity of labor. The economic value, or shadow price, of labor may substantially differ from the market price, especially in countries with high unemployment and neo-colonial wage structures. Other problems with using rate of return include the omission of earnings of students, the calculation of lifetime earnings from cross-sectional data which assume a static wage structure, 2/ and finally, the inability of the results to aid in determining the magnitudes of future investment since the analysis is not carried out in the context of optimization. Also, owing to the lack of data, or its imprecision, rural wages are omitted, or interpolations are made from urban wages. When 90 percent of the labor force is employed in agriculture, urban rates of return do little to assist in clarifying educational investment policy for predominantly rural nations.

There are different types of rate of return. Estimates of private rates involve costs paid by the individual and the benefits after taxes, while social rates involve costs paid by the society and the benefits before taxes. Other types include marginal rates of return accruing to the grades within each of the three levels of education, and the calculation of the optimal enrollment rates to ensure the equality of the rates of return to education.

A more modest, but more realistic, approach to the problem of using earnings as a measure of the value of schooling is the simple causation approach. The causal approach searches among the multitude of economic factors including behavioral ones, to answer the central question, Why do some individuals earn more than others? The discounted lifetime earnings and causal approaches are compatible theoretically. It seems, however, that refinement of the causal approach may yield a significant amount of information

about alternative areas for investment to increase earnings. The causal approach suffers from some of the same drawbacks as the lifetime earnings approach - for example, wage rates that poorly reflect the marginal productivity of labor - but it does not require assumptions about either the costs of education or the benefits. For an example of this approach see Hansen, Weisbrod, and Scanlon (1970). The major advantage is that it enables the analysis to focus on the question of why some individuals receive higher earnings than others. 3/ The major disadvantage is that the costs of optimizing the background conditions that lead to high earnings are not included in the calculation.

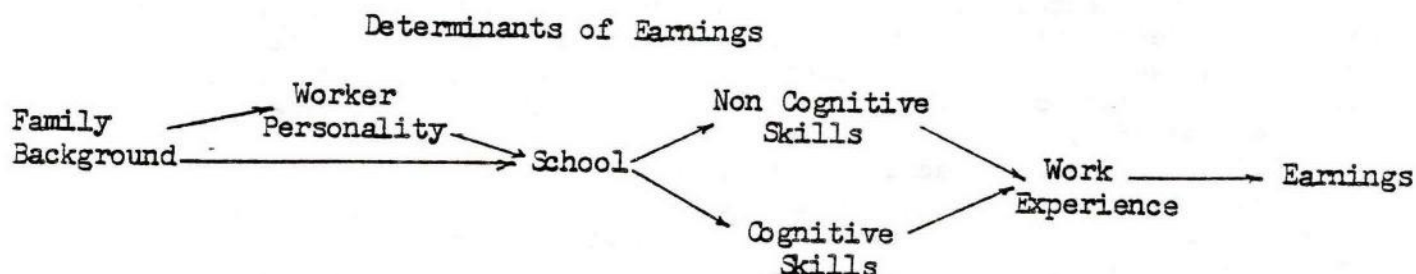
The theoretical models available for testing these questions, shaped by the confines of a single discipline, may not meet the full dimensions of the problem. 4/ Empirical work that would consider the importance of some of the full range of causal possibilities of high earnings is virtually nonexistent. Only in the most recent economic studies, for example, do we find an acknowledgment of such factors as socioeconomic status and ability. The Thias and Carnoy study (1972) in Kenya attempts to control for several background factors in estimating urban wages; these include the occupation of the father, tribal background, and parents' education. The Hansen, Weisbrod, and Scanlon study (1970) of low achievers in the United States controlled for ability and family size. While Jencks' review (1972) of the research finds that personality and luck are the major determinants of income, they are absent from most the economic models.

Sociologists, researching a similar question, use occupation rather than earnings as the dependent variable in their investigations of social mobility. The work of Blau and Duncan (1967), on the determinants of occupation in the United States, concentrates on the role of social factors. In short, our understanding of the factors contributing to earnings is far from complete.

In Tunisia, there have been two major studies of the determinants of earnings: (Carnoy, Thias, and Sack (1973) and Simmons (1972), both of which were discussed in chapter 2. The results of these studies are consistent with the data we will now present. We will show that the past emphasis on schooling as a major causal factor in high earnings is misleading. We will next describe the sample of workers, and then test several models for the rural and urban data.

As we have in the earlier chapters for cognitive achievement, we can begin by exploring the determinants of earnings, grouping them into the same factors used earlier: schooling, personality, family background, and work experience (see appendix C for a complete list). We hypothesize the determinants of earnings in the following model.

Diagram 8.1



Compared to models in the literature discussed above, this one is better specified as factors that were not considered in earlier studies are considered here. As in the earlier chapters we will examine the effects of the different factors for both rural and urban workers.

Rural Workers

As we indicated in chapter 3, the average earnings for the sample were 18.800 dinars per month, about 39 dollars in 1968. But the range in earnings was wide, with some workers earning as little as 5 dinars and others as much as fifty. ^{5/} The average age was twenty-one. The average worker had been out of school five years when interviewed and had been working three years. Thirty-eight percent of the sample had irregular employment, which was defined as being employed less than ten months during the past year. While several of the workers were either teachers or village officials, the rest were divided almost equally between skilled and semiskilled categories. We will now turn to the question of why some workers earn more than others in the village of Tadjerouine.

Schooling. The significant determinants of rural earnings as listed in table 8.1 do not include such traditional schooling variables as type of schooling or length of time that the workers attended. The use of one skill that is taught in school, however, is a significant determinant of monthly earnings.

A central finding of this study was that those boys with high earnings tended to use their French ability in reading, writing, and speaking. Even though they may be more proficient in reading Arabic, it is the use of French not Arabic that is a significant predictor of high earnings. (We have also noted this in chapter 5.) Whether they speak French as part of their job or in their leisure activities, they certainly do so as a result of their schooling, since French is not spoken in any of the families. It is important to recall from above that proficiency in French, as measured by the achievement test, was not significant in explaining earnings. High French achievers do not have high earnings. Rather, it is the subjects who use French who tend to have high earnings. In fact, the absolute level of proficiency is fairly low, with a subject having around a 50 percent probability of being able to read and understand passages from a national newspaper (see chapter 4).

Why is French used by these workers with high earnings? We have already suggested that it may be due to the demands of the rural work place, but given the occupational structure, and job descriptions, this is unlikely. Rather, it seems that the time spent using French is probably time spent outside the workroom. Thus, either the workers may see a future advantage in their capacity to use French and thus they practice it; or else they derive a present benefit, perhaps pleasure or self-esteem, from its use. The first possibility implies a capacity for individual planning, which, incidentally, is a characteristic of an individual with a high need for achievement and modern attitudes. The latter explanation might suggest a level of curiosity which use of French would help satisfy.

TABLE 8.1

Determinants of Rural Earnings

<u>Schooling</u>	<u>Direction</u>	<u>Variance</u>
Uses French	+	.12
<u>Work Experience</u>		
(None)		.00
<u>Background</u>		
(None)		.00
<u>Personality</u>		
Light a problem for homework	+	.09
Importance of a skill for stable job	+	.05

Source: Appendix table F.3.

The characteristics of the sample help to explain why the traditional schooling variables are not significant. The range of job possibilities that require formal education of the type which is taught in the schools, the supply of schooling is limited to little more than primary for most of the workers. To find higher-paying work in the cities would require virtual completion of secondary. Some minimum threshold of French comprehension was useful in determining the high earnings among our sample, but school attendance was not the basic reason that the workers either learned or used these skills (see annex table 8.1). These reasons lay with the non-school factors.

Work Experience. None of the work experience variables were significant in predicting earnings. We can only speculate about the reasons for this findings, which is not consistent with the analysis of urban workers below. The kinds of jobs that the sample have require only a minimum amount of experience for these workers to become proficient, so that at the end of six months or so there is little difference in the productivity of those with ten years experience and those with six months. A second possible explanation is that a cross-sectional measurement of earnings does not capture. The fact that, in getting one of the several better-paying jobs that are available in the village, whom you know may be more important than what you know.

Personality. The workers who found that the lack of light was a problem when they were students doing their homework tended to have higher earnings they those who did not. In chapter 4 we found that when light was a problem, the urban student had lower French scores. This variable could be a proxy for economic conditions or motivation (i.e., they wanted to work on their homework but could not). Perhaps it was the boys who were particularly persevering in their homework who mentioned lighting when asked what problems they had encountered doing their homework. Also, lighting complaints could be a proxy for family attributes such as low SES indicating which families could not afford an oil lamp, or high educational aspirations for their son (which pushed him to study under difficult conditions, including poor light).

Notable for its absence as a predictor of earnings is our measure of SES. The simple correlation between earnings and SES is .10, which is not significant at usual probability levels. If the community had a wider SES range, however, we would expect a closer association.

The workers with higher earnings replied that having skill was important for a stable job. If they had this idea for some time, perhaps it was the reason for their high relative salary; that is, their desire to learn a skill make them good and well-paid workers. It would be a measure of perception and motivation.

Workers Opinions. We have made our interpretations of the relationship between earnings and schooling. What are the views of the subjects? We asked them, "In your opinion, what is the minimum level of education necessary to find a job suitable for someone like yourself?"

The worker defined "suitable" as being a skilled worker in the artisan sense. The replies confirm their realistic view of the available job opportunities and the amount of education they feel would be useful for them. The majority replied that the minimum educational level is the equivalent of the brevet, which is a technical school degree awarded after a total of nine or ten years of schooling. As shown in table 8.2 the replies are usually

one certificate more than the one the subjects had reached themselves. Contrary to what we might have expected, they did not feel that the academic secondary certificate, the bac, was a minimum. Their educational aspirations are certainly not high, and only a few years higher than they in fact achieved.

TABLE 8.2

Minimum and Present Education
(Percentage of n21)

	<u>Considered Minimum Education</u>	<u>Their Level Education</u>
Education: none or not necessary	0	5
Primary: 1-5 years	0	14
Primary: 6 years, diploma	29	48
Secondary: 1,2 years	0	19
Secondary: 3,4 years <u>brevet</u>	67	14
Secondary: 5 years and first part of <u>bac</u>	5	0

Note: "Minimum education" is variable 291, "Level" is variable 140, see appendix C.

We asked the subjects to define "suitable" in terms of job types. The replies were coded into four categories and are presented in table 8.3. Those who are not in the middle category would like to move into it. But none of those who are there would like to move up to the highest category. They may feel either that their lack of education excludes this opportunity, or that they have achieved their job expectations.

TABLE 8.3

Present and Suitable Occupation
(Percentage of n21)

<u>Occupation</u>	<u>Present</u>	<u>Suitable</u>
Unskilled, semiskilled	48	14
Skilled, low official, tradesman	43	81
Teacher, middle official	10	10

Note: "Present" is variable 62, and "Suitable" is variable 92, see appendix C.

Job security is probably the most important single criterion for employment within the lower-skill ranges. We probed this criterion by asking, "What is necessary for finding stable employment?" We found the workers evenly divided in their answers between family influence (38%), having a skill (33%), and primary education (29%). Given the social demand for education and its supposed necessity for desired types of jobs, it is surprising that it is not the dominant reply. Perhaps this lowering of education as a priority occurs once they are employed. Or, is reverence for education diminishing with each generation as it becomes less and less able to guarantee getting a job. Furthermore, it is unclear whether they feel that future employers place highest value on the cognitive and behavioral skills schooling teaches, or the fact of attendance, or the diploma.

We then asked two successive questions: "What job do you think you will actually have in ten years?" and then, "But if it were just up to you, what occupation would you like to have?" Their expectations were realistic, with almost one-third replying that they would hold manual or semiskilled jobs and one-half, artisan and clerical posts. The proportions of those men expecting to obtain the two higher job categories in table 8.4 are also not unrealistic, assuming that the minimum education requirement for the jobs does not increase and the economy continues to grow. The 10 percent in category 3 could conceivably move to category 4 - as could those in 2 move to 3.

TABLE 8.4

Job in Ten Years: Expected and Desired
(Percentage of n21)

<u>Job Category</u>	<u>Present</u>	<u>Expected</u>	<u>Desired</u>
1. Unskilled, semiskilled	48	28	5
2. Skilled, low official, tradesman	43	53	38
3. Teacher, middle official	10	10	19
4. Professor, high official	0	10	38

Note: "Present" is variable 62, "Expected" is variable 97, and "Desired" is variable 98; see appendix C.

So far, we have only indirectly sought the subjects' views of the utility of education in achieving high earnings and job satisfaction. The views reported in table 8.3 suggest the importance of primary and technical education, while the views on what is necessary to finding stable employment only mention primary education in passing and ignore the importance of technical education. The views seem to hold that at least primary schooling may be a necessary, but not a sufficient, condition for holding a suitable job.

Questioning them directly, then, on what they feel education offers for their job-performance, we asked the subjects, "Do you need to read and write in your work?" The results, in table 8.5, show that 53 percent of the sample did not require reading and writing skills on their present job.

TABLE 8.5

Job Requires Reading and Writing
(Percentage of n21)

	<u>Present</u>
No	24
Useful, not necessary	29
Yes, necessary	14
Job based on these abilities	13

Next, we then turned the question around and asked, "Does having gone to school help you do your work better?" Fifty-seven percent replied that it did not. The results from these two questions suggest the uselessness for more than half the sample of the cognitive skills learned in school.

In summary, the data on the subjects' views, both direct and indirect, of the relationships between education and employment permit several observations. First, this sample of rural young men seemed to have a realistic view of their employment opportunities and the amount of education needed to realize these opportunities. Second, 67 percent realized that having skill or family influence was more important than having primary education for obtaining stable employment. And third, between 53 and 57 percent of the sample found that skills they were taught in school did not significantly assist them in doing their job. These views of the subjects on the role of education, including the importance of technical rather than academic training, are consistent with the data on the determinants of earnings.

Urban Workers

Using the model of diagram 8.1, we test the hypothesis that the more schooling a worker has had, the higher his earnings will be after background and personality factors are controlled for. For the urban sample, workers are defined to include both white- and blue-collar categories. We will conclude, first, that after age and socioeconomic status are controlled for, the amount of schooling a worker had was significantly related to his earnings only if he had some years in secondary school. Time spent in primary school and in different types of technical training was not related to his earnings. Second, an individual's level of cognitive achievement as measured

on tests of language and math ability is not related to his earnings. Third, while it might appear that attendance at secondary school can produce noncognitive characteristics that indicate individual modernity, further investigations shows that this appearance is illusory. And fourth, from a series of interview questions we find that the workers themselves are aware of the relative unimportance of formal education, particularly primary, for their earnings. These four findings support the conclusion that in Tunisia, primary, technical, and secondary schooling have less relevance for workers' earnings than we had expected.

Earnings. The average earnings for the urban workers are 29.600 dinars per month, or about 56 dollars. This is 60 percent higher than for the rural sample, which is the same age group. As with rural sample only 14 percent had occupations that were in the middle-income range - teachers or middle-level officials, for example. In contrast to the rural sample, only 9 percent had employment less than ten months during the past year. We now turn to the question of why some workers earned more than others in La Goulette.

Schooling. In contrast to the determinants of rural workers' earnings, we find, in table 8.6, that the more grades of secondary schooling the urban worker had, the higher his level of earnings. Attendance of more or less years of primary was not significant for this sample of workers, who had left school an average of 5 years before they were interviewed. Consistent with the findings for the rural sample, the years of work experience were not a determinant of earnings.

Background. The higher the income of the extended family, the more the worker earns; this would include income from parents, siblings, and wife. The father's ability to find the son a good job may explain this correlation, or it may be that sons in higher-income families have the opportunity to learn those work traits that are attractive to better-paying employers.

The finding that the less the mother was involved with the son's education, the more the son earned is difficult to interpret. The average amount of education for the mothers was less than two years, so the effect of her formal education could not have been significant. It is probably a proxy variable for the son's perception of his mother's unsuccessful role in his obtaining more education and higher marks than he was able to.

The final finding about background is that the older the worker's father, the lower the worker's earnings. While we can only speculate as to the reasons for this finding, it may relate to the younger fathers' being more knowledgeable about higher-paying jobs.

Personality. Age appears to be the second most important determinant of earnings as measured by the variance explained. Employers must figure that, everything else being equal, the older boys in the 15-25 age group make better workers than the younger ones. Because work experience

is not significant, employers are much more interested in age than experience. Of course since the mean experience is three years for the sample, it may be too early for experience to count much in hiring decisions. Another study in Tunisia has shown that, for a sample of workers with a mean of eight years of experience, their experience was the most significant determinant of earnings (Simmons, 1974).

TABLE 8.6

Determinants of Urban Earnings

<u>Schooling</u>	<u>Direction</u>	<u>Variance</u>
Secondary levels	+	.20
<u>Work Experience</u>		
(None)		.00
<u>Background</u>		
Total family income	+	.06
Mother supervises education	-	.04
Father's age	-	.03
<u>Personality</u>		
Age	+	.11
Living at home	-	.10
Sought work	-	.04
Help with homework: family	+	.04

Source: Appendix table F.4.

Although we have used the pooling techniques described in appendix B to obtain the significant determinant of earnings, it is useful to describe several of the analyses that were made to check these results. First, we asked if workers with higher levels of cognitive achievement earned more than other workers. Using a regression model, we found that they did not (chapter 8, appendix F). Second, we asked if workers with higher levels of individual modernity or need achievement were associated with higher earnings. We found that modernity was not a significant determinant, but that need achievement was. When need achievement was pooled with variables from other factors however, it lost significance (chapter 8, appendix F).

Workers' Opinions. We have now completed our analysis of why we think some workers earn more than others. What do the workers themselves think are the important factors? We asked them the open-ended question,

"What is necessary to find stable employment?" This was a more fundamental and less ambiguous question than asking about finding "good employment." For example, good employment would leave the stability of the job in doubt.

As the results in table 8.7 show, primary education comes in a weak third. Secondary education was not mentioned. Thus, in contrast to adults who perceive education as being essential to the future living standard, we find that young men present a very different ordering of their priorities.

TABLE 8.7

For Stable Employment
(n37)

	<u>Percent</u>
Have a skill	65
Family position and pull	27
Primary education	8

To obtain further perspective on the relationship between education and earnings, we asked the workers employed during the past twelve months, "Do you need to read and write on your job?" The results, in table 8.8, show that 40 percent do not find that reading or writing are necessary for their work.

TABLE 8.8

Job Requires Reading and Writing
(n37)

	<u>Percent</u>
Zero	16
Useful but not necessary	24
Yes, necessary	30
Job based on these abilities	30

When we turned the question around and asked, "Does having gone to school help you do your work better?" 21 percent replied that it did not.

Finally, we asked about education and employment directly. "In your opinion what is the minimum level of education necessary to find a job

suitable for someone like you?" In contrast to the previous questions that explore the utility of schooling, this question gives them the opportunity to cite their educational aspirations. The replies should also reflect peer group and personal norms. For these reasons, it is not surprising to see from table 8.9 that 76 percent reply that 3-6 years of secondary are the minimum education for someone like themselves, while only 19 percent actually reached this level. Note also that no one aspired to the university as a minimum.

TABLE 8.9

Minimum and Present Education
(n37)

	<u>Present Ed.</u>	<u>Minimum Ed.</u>
Education not necessary	8	3
Primary: 1-5 grades	21	3
Primary: 6 grades, diploma	11	16
Secondary: 1,2 grades	43	3
Secondary: 3,4 grades; <u>brevet</u>	8	43
Secondary: 5,6 grades; <u>bac.</u>	11	33
Higher	0	0

Note: Secondary includes technical, i.e., college moyen, education professionnelle, and formal apprentice.

While the answers to the above questions may leave some doubt about how the workers perceive the utility of education, a pattern does emerge. Stated briefly, it is that the workers perceive only minimal benefits from education for both their present and future employment. If they had the opportunity for more education, they might have taken advantage of it, but taking advantage of this opportunity would probably be more related to parental and peer group norms rather than to the economic utility of education. The urban workers' perception of the modest economic utility of schooling is consistent with the results of the tests of the earnings models.

Conclusion. The tests of the earnings models suggest results that are significant for both future research and investment in human resources. 6/ First, after we used the traditional model to control for age and SES, we found that most types of schooling were insignificant in providing higher earnings for workers. Attendance at secondary school was the one type of

schooling that did contribute to higher urban earnings. Second, two noncognitive attributes - modernity and need achievement - were tested, and neither one was found to be a significant predictor of either rural or urban workers' earnings. Third, the workers' level of cognitive ability as measured by achievement tests in math, French, and Arabic was not related to earnings. Finally, when the workers themselves were interviewed, they did not emphasize the role of education in providing secure employment. Other studies in Tunisia, using a larger sample, have produced consistent results (Carnoy, 1975; Simmons and Noerenberg, 1975).

Some readers will ask why we have not attempted a rate of return calculation using the corrected model or estimated a cost benefit ratio. The purpose of this study was not to produce a new figure for debate, but rather to show that the assumptions underlying the traditional model have been misleading. Furthermore, because we did not sample upper-income workers, our results could not have been compared to other results. Other readers will note that we have tested our model only with primary and lower-level secondary workers. That is true, because it is precisely there that most students in Tunisia, as well as in other developing countries, are found. With the nature of the educational situation, their location will not shift markedly in the next several decades.

Given these results, we may question what the benefits of education are, and who is receiving them. More years of schooling for more children appear to be a goal that satisfies the emotional aspirations of parents, the political needs of government officials, and the financial needs of the vast educational establishment. How is schooling policy really serving the children and society? Which types of schools are serving these two groups better than others? Are achievement scores or lifetime earnings good criteria of schooling success? If they are not, then what are the proper measures to evaluate the contribution of schooling to the development of the individual and the society?

The major finding for our sample of workers in two communities is that school attendance becomes less important as a predictor of earnings than we would have expected from the literature on the economics of education. The significant factors are virtually unmeasured in previous economic studies. Furthermore, the schooling variable is replaced by family background and personality characteristics, suggesting that schooling tended to be an intervening rather than a causal factor in the models. These modifications to the traditional economic model significantly improve its predictive ability. Finally, these results are consistent with social and psychological literature on the role of schooling in work success. For a rural and urban sample of young workers, then, the wisdom of less than a century's duration - that schooling, especially academic, contributes to earnings as we had expected - needs to be carefully reviewed.

Footnotes for Chapter 8

1. "Consumption benefits must be those that accrue to the student at the time of purchase of the asset — namely, during the period of schooling itself" (Bowles, 1969, p.12).
2. Selowsky attempts to overcome some of these problems.
3. Because of the unrealistic assumptions required in discounting the present value of the lifetime earnings of the worker, this study uses monthly earnings instead. For an example of this simplified approach, see Hansen, Weisbrod, and Scanlon (1970). For comments on Hansen et al (1970), see Barry Chiswick, Stanley Masters, and Thomas Ribick and the reply by Hansen, Weisbrod, and Scanlon in the American Economic Review (September, 1972), pp. 752-762.
4. The literature on measuring the economic benefits with the rate of return approach is extensive. Schultz (1961) provides a review of the early literature as well as estimating a rate of return to American investment in education (1963). While literature for the developing countries is scarce, examples include Bowles (1969), Carnoy and Thias (1972), Dougherty (1969), and Gourden (1967). Examples of additional work include Becker (1962), Mincer (1962), and Weisbrod (1962). For a review of the debate on the rate of return approach, see Bowen (1964). More recent studies that tend either to refine or to contradict the conclusions of the early literature include Gintis (1971), Hansen, Weisbrod and Scanlon (1970), and Selowsky (1969). For recent studies on the factors associated with school achievement that confirm a diminished role of schooling, see Bowles (1970), Coleman (1966), and the Plowden Report (Central Advisory Council, 1967). Examples of the extensive popular literature on the critique of benefits of schooling are Illich (1971), Rubenstein (1970), and Silberman (1970).
5. Sociological studies use a similar model with occupational status as the dependent variable. We found the correlation coefficient between earnings and occupation to be .89. We then used the pooling procedure to regress the independent variables against occupation (see appendix C for the variables). The same variables that were significant for the improved earnings model appear (appendix table F.4). We concluded that for this sample the measures of earnings and occupational status were similar.
6. Two improvements were made in specifying the independent variable. "Grades of school" were a better specification than "years of school." And "type of school" was a better specification than "grades of school." On-the-job learning is directly measured by length of job experience, a better proxy than ones used previously. Relative benefits to different types of education were clarified.

ANNEX TO CHAPTER 8

FURTHER TESTS WITH EARNINGS DETERMINANTS

Quantity of Rural Schooling

The traditional earnings model (Becker, 1962) is in the form of at least squares regression equation:

$$Y = f(\text{schooling, age}),$$

where schooling is measured in grades of school completed (GS), earnings (Y) is the mean monthly salary for the months employed, and age (A) is years. The least squares technique gives unbiased estimates of the regression coefficients only if the independent variables are exogenous, i.e., only if they are uncorrelated with a disturbance term in the equation. (See Bowles, (1970) for a discussion.) Sociological studies use a similar model with occupational status as the dependent variable. We found the correlation coefficient between earnings and occupation to be .89. Using the pooling procedure described in appendix B, to regress the variables of the four factor against occupation, we found, the same variables significant as we found for the improved earnings model. We concluded that for this sample the measures of earnings and occupational status and their determinants were similar.

We will first test our model by estimating the regression coefficients for grades of school:

$$Y = f(\text{GS} + \text{A}).$$

We estimated the following regression for rural workers:

$$(1) \quad Y = 8.28 + 2.62 \text{ GS}^* - .30\text{A} \quad R^2 = .25$$

(1.07) (.96)

() Standard error

* Significant at P .05.

The results partially conform to findings from the literature on the test of the traditional model. The regression coefficients for schooling, but not age, are significant predictors of earnings.

Several problems exist with the validity of the age and schooling variables. What are they measuring? Are there better measures for the same concepts?

The first problem with the traditional model is the measurement of schooling. In contrast to developed countries, the probability for repeating a grade is very high in Tunisia, as in most developing countries. Some subjects attended school for six years, but reached only the fourth-grade level because they repeated one grade twice, or two grades once. To test the possible importance of years of schooling (YS), this variable was substituted for grades of schooling. The result of equation 2, when compared to equation 1, indicates that years are almost significant at normal levels of probability. Thus, grades of school are only a slightly better measure of the contribution of schooling to earnings than years of school.

$$(2) \quad Y = 8.36 + 1.33YS^+ - .06A \quad R^2 = .17 \\ \quad \quad \quad (.69) \quad (1.02)$$

() Standard error
+ Significant at P .08

We should note, however, that the question of whether or not students should receive almost automatic passes until the end of each cycle - e.g., primary - is more than merely a matter of class marks and test results. It may also directly affect an individual's earning capacity. Our observation, which is consistent with traditional findings, does not support the policy of retaining children in school for as many years as possible when they are not automatically promoted.

A second problem is age. In the traditional earnings model, age is usually considered a proxy variable for a number of socioeconomic factors, including wisdom and ability gained over time. Age reflects the depreciation and obsolescence of learning and training. It may also measure some motivation that is connected with family responsibility, such as having a wife and children. Traditional models use it because better measures of these characteristics are not available in the published statistics usually employed by economists. In this study, however, we measured the length of time the subject was employed (LE). This has an important advantage over age since subjects of the same age may have been employed for different amount of time. It is also a proxy for measuring learning by looking and doing. We tested this hypothesis in the following equation:

$$Y = f(GS, LE, A).$$

The results in equation 3, below, show that after grades of schooling are controlled for, length of employment is not a superior measure of those dimensions of work experience and maturity which are required for high earnings. That it is not may be due to the small amount of experience which is required to learn the jobs the sample workers are doing. Other research in Tunisia on workers with more experience (Simmons, 1972) has shown the significance of work experience. We feel justified for this sample, however, in removing both age and length of employment from further models estimating earnings.

$$(3) \quad Y = 13.55 + 1.85GS^* + 1.03LE - 0.51A \quad R^2 = .26$$

(.85) (1.20) (1.13)

() Standard error

* Significant at $P < .05$

The significant coefficient for grade level reached indicates that the higher the grade level the subjects reach, the greater the probability of higher earnings. In measuring schooling, attendance at the kuttab, or the pre-primary school which teaches writing by using verses of the Koran, was omitted because it was negatively related to earnings. Including it would have thus given a downward bias to total schooling (see annex table 8.A). This finding is consistent with findings from tests of the traditional model in the United States and in developing countries. A number of interpretations of the Tunisian findings are possible. First, it is the "duller" subjects who tend to have a large number of years of school. The "brighter" boys pass more grades in fewer years and earn more. This model, however, cannot suggest if being "brighter" is attributable to cognitive abilities or to other personality characteristics.

Second, employers probably have a grade-level bias when they look for new workers. The more grades of education, the more attractive the applicant is, regardless of the applicant's true ability to do the job, everything else being equal. Third, personality is probably modified favorably by not repeating grades; the student who moves through the primary system with a minimum of repeating avoids frustration or the failure syndrome, either of which could negatively affect ability and thus earnings. Elsewhere it has been shown that teachers grade students as much, if not more, on their personality traits as on their learning abilities; thus, "duller" should include students with fewer favorable personality traits as well as those with less-developed cognitive processes. The "brighter" student may simply have conformed better to the social norms desired by the teacher (Kohn, 1969). The data of the present study cannot clarify the likelihood of these possibilities. We did, however, test age and employment for interaction in the earnings equations and found them not significant. To summarize, we have found that while total years of schooling are less significant in predicting earnings than the level of schooling reached.

Quality of Rural Schooling

Does the type of education make a significant difference in predicting the earnings of the sample? Should not, for example, secondary or technical education measurably increase the probability of higher monthly earnings? We now test these hypotheses in an equation where total years of schooling are broken into their components: kuttab, primary, secondary, technical, and apprentice. As we noted earlier, the technical education is mainly classroom work, while apprentice training, though still in a school, is more practical. Technical school is more prestigious than apprentice

school, but both require, in principle, completion of six years of primary for admission. In contrast to most apprentice schools in Tunisia, this one was located in a nearby factory and supervised by the owner.

The results, in annex table 8.A, indicate several findings that are significant. First, the type of education that the subject had tends to be associated with high earnings. The traditional studies of earnings as a function of schooling do not usually disaggregate schooling and thus they conceal a potential effect of different types of schooling. It is important to note, however, that primary education was required to enter the technical school or the apprentice center. Thus, it appears for this sample that a minimum quantity of education (i.e., primary schooling) was the necessary, but not sufficient, condition to achieve high earnings. Note, however, that this result does not relate to what was learned, but rather to the amount of time spent in each type of school.

Second, a worker with a year of apprentice training in this village earns 0.722 dinars/month more than other workers earning near the mean wage. Because this apprentice center was run by the manager of a neighboring factory which employed the graduates, this center is definitely an exception compared to other Tunisian centers. Below we will find that urban apprentice training is not significant.

ANNEX TABLE 8.A

Rural Earnings and Schooling

Dependent Variable: Earnings/Month

<u>Independent Variables</u>	<u>B</u>	<u>Beta</u>	<u>t</u>	<u>r</u>	<u>1x'x1</u>
53 Apprentice	7.22	.54	3.46	.63	1.00
164 <u>Kuttab</u>	-2.78	-.47	-2.34	-.58	.93
72 Tutoring	3.67	.36	2.17	.32	.91
51 Secondary	10.37	.28	1.84	.18	.76
54 Primary	-1.24	-.16	-0.78	.38	.38
52 Technical	-0.022	-.04	0.25	.11	.32
Constant	21.27				
R ²	.72				
F for equation	6.04				
n observations	21				

Note:

When t = 2.83, P < .01; when t = 2.08, P < .05.

Third, attendance at the kuttab has a negative effect on earnings of 0.24 dinar/month for each year attended. The implication is that years spent at the kuttab either directly affect the subject's earning capacity or are a proxy variable for a set of unmeasured and unprofitable attitudes and behaviors.

Fourth, neither secondary nor technical schooling makes significant contributions to earnings. Note, however, that we are examining the effect of an average of a little more than one year of a different type of schooling rather than what might be termed a significant amount of secondary schooling. If the sample had contained subjects with an average of four years of secondary school, we would have hypothesized this to affect their earnings. The important point, however, is that less than 2 percent of the school-age population in a rural community like Tadjerouine gets more than a year or two of secondary or technical. Thus, the findings tend to describe what may typically happen to rural boys.

We have looked at total quantity of schooling and type of schooling as predictors of earnings. Is there a relationship between educational achievement, another measure of schooling quality and earnings? For American middle- and upper-class groups the relation is positive, as both Wolfe and Smith (1956) and Weisbrod and Karpof (1968) illustrate. For American lower-class groups the relationship is weak or not significant, as the studies by Hansen, Weisbrod, and Scanlon (1970) and by Weiss (1970) show. Based on the limited number of American studies on low-income populations, we should expect the relationship between Tunisian educational achievement and earnings, to be weak or insignificant.

An important component of an individual's learning ability and one which is usually omitted in the estimation of the earnings model, is some measure of personality. We attempted to measure both achievement motivation (NACH) and modernity (MOD) of the sample. We estimated an earnings regression with these variables.

These measures are based on the work of McClelland and Winter (1969) and Inkeles (1974). Need achievement was measured with a scale composed of sentence completion items adapted from Rogers and Neill (1966). Modernity was measured by Inkeles's and Smith's short form 6 (1969) of their overall modernity scale. The results of equation 5 indicate that modernity is significant at the .05 level but need achievement is not.

Using the samples' scores on the three achievement tests -- math (MA), Arabic (AR), and French (FR) -- we estimated the following earnings regression:

$$(4) \quad Y = 10.40 + 1.98FR + 1.61AR - 1.87MA \quad R^2 = .11.$$

(1.91) (2.27) (2.77)

The results are not encouraging for establishing a strong relationship between educational achievement and earnings of the sample. None of the three achievement scores is significantly related to the earnings of the sample. We thus conclude that the quality of the subjects' cognitive ability as measured by the tests is not a determinant of earnings for the sample.

Quantity of Urban Schooling

As it was for the rural sample, the traditional earnings model was specified for the numeral data, whereby schooling is measured in terms of grades of school attended (GS) and age is measured in years (A). We estimated the following regression:

$$(5) Y = -37.87 + 3.41GS^{**} + 2.15A^{*} \quad R^2 = .45$$

(.83) (.95)

() Standard error
* P .05 level
** P .01 level.

The results indicate that both the grades of school that a young worker attended and his age were significant in predicting his monthly earnings. This is consistent with traditional findings.

As we did with the rural sample, we measured the length of time the subject has been employed (LE). It is a crude measure of informal on-the-job education, learning by looking and doing. This specification has the advantage over age that it corrects for those subjects who may be the same age but who have worked less time. We tested this variable in the following equation:

$$Y = f(GS, LE, A),$$

and the results are presented in equation 7. They show that the length of employment is not a significant predictor of income. The mean length of employment was 3.1 years, and the standard deviation was 2.0. The period may have been too short, or the jobs learned in a short time.

$$(6) Y = -41.47 + 3.28GS + 2.74A^{*} - .72EM \quad R^2 = .45$$

(.87) (1.16) (1.49)

() Standard error
* Significant at better than .05 level
** Significant at better than .01 level.

Quality of Urban Schooling

Is attendance at a grade of primary school "worth" more to the worker than a grade of secondary? We now examine this question as it relates to the different types of schooling that the worker had. These types include the kuttab, the assistance gained through private tutoring that many students use, apprentice training (which is a practical shop course), and technical training at the college moyen (which is classroom instruction). In principle, both apprentice and technical training require six years of primary school. In the regression equation in annex table 8.B, we tested the contribution of the various types of schooling, while controlling for years of employment. The results indicate that of all the types of schooling tested, only secondary was significant in predicting workers' earnings. Of course, primary attendance was required for those who gained admission to secondary, but for those men who had only primary, it was not significant.

ANNEX TABLE 8.B

Earnings and Schooling

Dependent Variable: Earnings/Month

<u>Independent Variables</u>	<u>r</u>	<u>Beta</u>	<u>t</u>
165 Secondary level	.63	.55	3.84
54 Primary	.35	.23	1.59
53 Apprentice	.30	.12	.86
72 Tutoring	.06	-.09	-.63
164 <u>kuttab</u>	.11	-.07	.51
166 Technical	-.04	.00	.00
Constant	9.7		
F for equation	4.35		
R ²	.47		
lx'xl	.74		
n observations	37		

In another equation, not reported here, years of each type of schooling were substituted for grades. The hypothesis was that the number of years a worker attended each type of school was more important than the grade of school he reached. The regression results were virtually the same. Only secondary was significant.

We saw above that attendance at secondary school was strongly related to the workers' earnings. But our improved causal model calls for the inclusion of background factors like SES and age before the schooling variables are entered in the equation. The background factors are included in the estimation made in annex table 8.C. The results reduce the significance of secondary schooling. We tested other types of schooling in the same model; they proved insignificant. From equation 2 annex table 8.C, when secondary was entered without age and SES, secondary explained 39 percent of the variance in earnings. When SES and age were entered in equation 3, the Beta of secondary fell from .63 to .42 and the R² increased from 11% to 50%.

ANNEX TABLE 8.C

Earnings, Background, and Schooling

<u>EQ.</u>	<u>Beta Coefficient (t tests)</u>			<u>R²</u>	<u>1x'x1</u>
	<u>SES</u>	<u>Age</u>	<u>Secondary</u>		
1	.45 (3.31)	.36 (2.67)		.37	.99
2			.63 (4.76)	.39	1.00
3	.27 (1.89)	.25 (1.94)	.42 (2.88)	.50	.70

Note: When t = 2.76, P .01; when t = 2.05, P .05.

We have considered the quantity of schooling that the workers have had and the different types of schooling. We now turn to the question of the effect of the workers' cognitive achievement on their earnings, controlling for age and SES. Do workers with higher levels of cognitive skills - as measured on achievement tests in Arabic, French, and mathematics - have higher earnings? We estimated the following least squares regression to test this question:

ANNEX TABLE 8.C

Earnings and Cognitive Achievement

<u>Independent Variables</u>	<u>r</u>	<u>Beta</u>	<u>t</u>
40 SES	.49	.42	2.75
42 Age	.42	.38	2.50
130 Arithmetic	.47	.27	1.17
132 French	.25	-.33	-1.69
131 Arabic	.32	.15	0.72
Constant		-31.58	
R ²		.45	
F for equation		5.13	
lx'xl		.14	
n observations		37	

Note: When t = 2.76, P .01; when t = 2.05, P .05.

The result indicates that after we control for SES and age and enter the variables separately, a worker's "doing well" in major school skills bears no relation to his level of earnings. The finding raises policy questions of investment efficiency and social equity. If earnings are the proxy for return on investment in cognitive skills learned in school, how do educators justify the schools' emphasis on teaching what appear to be unprofitable cognitive skills? If workers earn more because not because they developed cognitive skills in school, but because they attended secondary school. What kind of skills are they learning in school that the employers are rewarding? How equitable is the use of achievement tests to promote some students to secondary school and not others? Could the achievement criterion, which appears to be both inefficient and irrelevant, be serving the needs of educational institutions rather than society?

Since American studies of worker performance (Gintis, 1971) stress the role of noncognitive personality attributes in contributing to earnings, two measures were used in this study. The measurement of need achievement as conceptualized by David McClelland (1969) and operationalized by Rogers and Neill (1966) taps the extent to which workers are achievement-oriented. The Overall Modernity Scale developed by Alex Inkeles (1974) measures the extent to which an individual tends to be traditional or modern in his view of the world and himself.

We tested the possible impact of these variables on earnings in regression 2 in annex table 8.E. The results show that after age and SES are controlled for, neither a worker's modernity nor his need achievement is significant in predicting his earnings. Note, however, that adding the two personality measures significantly lowered the October SES.

ANNEX TABLE 8.E

Earnings, Modernity, and Need Achievement
(n37)

<u>Eqh</u>	Beta Coefficients (t tests)				<u>R²</u>	<u>lx'xl</u>
	<u>SES</u>	<u>Age</u>	<u>Modernity</u>	<u>NACH</u>		
1	.45 (3.31)	.36 (2.67)			.37	.99
2	.33 (2.40)	.31 (2.29)	.26 (1.74)	.21 (1.63)	.49	.69

Note: When t = 2.76, P .01; when t = 2.05, P .05.

Chapter 9

The Past as Prologue:

Conclusions and Policy Implications

The study offers insight into the educational policy and research issues which have so far not been available for most other developing countries. Because of the long support by the Tunisian Government for research, a synthesis of the findings is now possible. Furthermore, the comparative data reported on the rural and urban communities deepens the insight. This data analyzes for the first time in a comprehensive way for any developing country, the determinants of both cognitive achievement and earnings for samples from the same communities, compares students and workers from rural and urban communities, examines the role of cognitive achievement, including language skills, in the earnings of workers, reviews the issue of the depreciation of human capital by measuring loss in cognitive achievement, and, finally, studies the extent to which schools enhance levels of individual modernity among students, and then whether or not more modern workers earn more.

Schooling for development? The results presented in the previous chapters support the thesis that some Tunisian schools do not seem to be doing the job they were thought to be doing. Specifically, years of schooling are not as important for improving individual cognitive achievement or earnings as we might have supposed from either the early research or the present educational policy. In some situations, schooling appears to have little significance. As we have suggested in chapter 4, these findings are similar to recent research results for other developing and developed countries.

The processes related to cognitive achievement are a central concern of the economics of education. First, cognitive achievement can be viewed as one of the outputs of an educational production process that combines labor and capital - the technology of education. A usual concern of economic analysis is determining the optimum process in which maximum output - cognitive achievement - can be obtained at the least social cost combination of labor and capital. For example, are the marginal investments in student achievement higher to the dollar spent on teacher training or parent education or laboratory equipment? Only if we improve our understanding of the technology of education can we make future investments more efficient and effective.

Second, formal education requires more money than any other single sector in most societies, both developing and developed. Yet, until recently, we have had only a few methods available for understanding how investments in education contributed to economic growth and welfare. Thus, the processes relating to cognitive achievement to worker productivity are a central concern for the economics of education.

While the results of our study have been summarized at the end of each chapter, including words of caution about their interpretation, there remains the need to review the major conclusions and the suggest the implications for future research and investment policy.

An Overview

The Tunisian educational policy has three major goals:

- (1) achieving a rapid spread of literacy and numeracy;
- (2) teaching technical and management skills; and
- (3) modernizing attitudes and behavior.

While it would be impossible to evaluate comprehensively in one study the progress on each of these goals, we did select several measures as indications of each of these. For literacy we chose tests of reading comprehension in Arabic and French. For science, we used tests of arithmetic ability. We also measured the amount of apprentice and technical training received to determine the impact on worker education. And for modernizing attitudes and behavior, several measures were used including individual modernity.

A word is needed on what schools have done for cognitive achievement levels of the students in the samples. Our question for research was, Why did some students learn more than others? The question was not, Do students learn anything at schools? If they learned nothing, then most students' achievement scores would have been zero. Some would have learned these skills outside of school. The school did teach the skills we measured. We noted in chapter 4, however, that while most of the scores were not zero, a small but significant number of students scored either zero or sufficiently close to zero to indicate that even after five, six, or more grades of schooling, they could not read or calculate. Thus there are two aspects to the improvement of cognitive skills. First, the schools taught cognitive skills and most of the students learned something. Second, some students learned a great deal more than others.

Our approach to the problem of schooling for development has been sequential. First, we examined the role of schooling, personality, and family background as inputs in a process that produces cognitive achievement and modernization. Then we studied the amount of schooling, cognitive achievement, and modernization as several inputs that contribute to the workers' earnings. Given the nature of the problem, the methods of analysis have been eclectic, drawing mainly on the field of the economics of education, and partly on the social psychology of modernization.

The level of cognitive achievement in French, Arabic, and arithmetic was surprisingly low for students who had finished primary school. While UNESCO publications suggest that adequate literacy is obtained after four

years of schooling, our data suggests that eight years for students is more realistic. "Adequate" is defined as an ability to read and understand passages from a national newspaper. Thirty-eight percent of the sixth-graders passed the test in Arabic and 27 percent in French on tests given to 442 students in 12 schools across the country and reported in chapter 2. Our results in chapters 4, 5, and 7 are consistent with those for the 12 schools. Unfortunately, the national exam results for primary leavers cannot be used to test functional reading comprehension. National exams are designed to select for promotion, not determine functional reading skills, and the grading often reflects pressures from parents and others to change the results rather than the student's performance.

The cognitive achievement of boys who were in the last years of primary school and the first years of secondary for both the rural and urban area was predicted using a linear regression model (Appendix B). The results for both urban and rural samples showed that dimensions of the student's home environment and his personality were equally strong, if not stronger, predictors of cognitive achievement in French, Arabic, and arithmetic than was either the amount or type of the schooling that he received.

The effect of schooling, defined both by years and type of school attended, on the three measures of cognitive achievement is summarized in table 9.1. The schooling effects are measured while other factors in the cognitive achievement model - family background and the personality of the student - are controlled for. The percentage of the sample in the apprentice schools and in higher education was too small for analysis. In the table, "yes" indicates that the specific type of schooling affected achievement, while "no" indicates it did not. This is after controlling for the factors of background and personality.

Out of thirty-three opportunities for the schooling to be effective, it is so in only five of them. Even if we reduce the opportunities to twenty-one by removing the two types of purely private schooling, kuttab and tutoring, the results are little better.

TABLE 9.1

School Effects on Cognitive Achievement of Students

<u>Rural Achievement</u>	<u>Kuttab</u>	<u>Primary</u>	<u>Secondary</u>	<u>Technical</u>	<u>Tutoring</u>	<u>Uses French</u>
French	No	No /c	Yes /b	Yes	No	No
Arabic	No	No	No	No	No	No
Arithmetic /a	No	No	No	No	No	No
<u>Urban Achievement</u>						
French	No	No	No	No	No	Yes
Arabic	No	Yes	Yes	No	No	No
Arithmetic	No	No	No	No	No	No
<u>Sum Positive Effects</u>	0	1	2	1	0	1

Source: Tables 4.1-4.7.

- Notes: /a The number of times that grades were repeated was significant in predicting arithmetic for the rural sample.
- /b The positive effects, "yes," are beta coefficient significant at normal levels of probability after other variables are controlled for. See chapter 4 and appendix B for the methods.
- /c na: not applicable because of insufficient variance in amount of primary.

Why did some of the rural and urban school boys do better on the tests of cognitive achievement than others? The data in chapter 4 are clear. Characteristics of the family and home environment, including family income level and urban contact of the mother, are significant in five out of the six possible opportunities. The same is true for the effect of such personality dimensions as reading in free time, and organization attendance, on achievement scores. Personality is significant in five of six opportunities. In short, the lack of effect of schooling and the strong effects of family and personality are both recommendations for us to question the major effect of schools in accomplishing their self-defined role of improving cognitive achievement.

We then turned our attention to the young workers who had been out of school for an average of three years. How well did they score on the achievement tests, and what were the factors that contributed to the variance in their scores? Although the literature available on the subject is virtually nonexistent for any country, we expected that the length of time out of school

would be a significant factor in explaining test score variation after controlling for amount of schooling.

After controlling for the length of time out of school, plus the background and personality factors, we found that the impact of the amount and type of schooling on the variance of scores was similar to that reported for the boys in school. The results, in table 9.2, suggest the modest level of the impact of schooling on the variation in cognitive achievement of rural urban workers. Out of thirty-six opportunities only six were significant.

TABLE 9.2

School Effects on Cognitive Achievement of Workers

<u>Rural Achievement</u>	<u>Kuttab</u>	<u>Primary</u>	<u>Secondary</u>	<u>Technical</u>	<u>Tutoring</u>	<u>Apprentice</u>	<u>Uses French</u>
French	No	No	Yes	No	No	No	No
Arabic	No	No	No	No	No	No	No
Arithmetic	No	No	No	No	No	No	No
<u>Urban Achievement</u>							
French	No	No	No	No	No	No	Yes
Arabic	No	Yes	Yes	No	No	No	No
Arithmetic	<u>No</u>	<u>Yes</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>
<u>Sum Positive Effects</u>	0	2	3	0	0	0	1

Source: Tables 5.3-5.5 and 5.7-5.9.

Note: See Notes for table 9.1.

These results are slightly stronger than for the students reported above. What are the possible explanations? None is satisfactory, and all are only speculations. First, there is a lag effect. It takes several years after completing school before it begins to have an impact on achievement levels. Second, the workers who received their schooling some years before the present students, came from families with more favorable environments for learning and thus learned more from their schooling experience. Third, the quality of the instruction was better when the workers went to school than it was when the students were tested. Fourth, the average ability or motivation of the students has fallen in the same period. Only longitudinal studies will help to suggest which of these factors, or their combination, may be relevant.

Some indication of the answers to the above questions is given in an investigation of the retention of cognitive ability in chapter 7. The retention model included factors of background, personality, amounts of schooling, time since school, and use of cognitive skills to predict gain or loss of achievement. We compared the scores of urban workers who had been out of school with students who were still in school. Both groups had only six years of primary.

The results showed that 58 percent of the out-of-school workers declined in their Arabic score, 50 percent in French, and 46 percent in math. Important proportions (13 percent-29 percent) could no longer read or calculate. While personality and family background were important in explaining the gains and losses, time out of school was not. Thus, the evidence suggests that reaching a certain level of cognitive achievement in school is no guarantee that the level will be maintained. Furthermore, the percentage who lapse into illiteracy is significant, even among those who spent up to nine years in school and successfully passed six grades. Serious depreciation of human capital has occurred after an average of only three years passed since leaving school.

A major goal of Tunisian education has been to change the attitudes of the population, to modernize them. Do schools play a role in this process? If so, do they have a permanent or temporary effect? Do modern attitudes lead to an improvement in individual and social welfare? First, we asked in chapters 4 and 6 if the more modern students were the ones who did better on the tests of cognitive achievement. We found that they did not. Then we asked if workers, including the unemployed, who scored high on the achievement tests were more modern. We found that the rural workers were on all three tests, and the urban workers were on one test, arithmetic.

It is not clear why modernity was an important determinant of cognitive achievement of the workers and not the students. There are several possibilities. First, the experience the workers had after leaving school, both at work and outside, strengthened the relationship between modernity and achievement. Second, the experience of the work place generated higher or stronger levels of modernity. And third, our measure of modernity is more suited to adults than to adolescents.

Did schooling contribute to high levels of modernity among students? The data are clear for the urban group, but ambiguous for the rural group. They are ambiguous because the secondary schools where several students attend are located in the towns, where modern influence may be greater. More modern students did not have a high level of schooling or different types of schooling.

Do the more modern workers tend to have more formal education? The results in chapter 5 suggest that education was a necessary, but not sufficient, condition for a high level of modernity.

Finally, we turn to the question most widely researched in the economics of education - the role of schooling in earnings and productivity. We tested traditional models that predict workers' earnings on a basis of age and schooling. We found, consistent with previous research, that both age and schooling were significant. But most previous research is based on models that omit factors of ability, family background, and personality which should be significant in predicting earnings. In the improved earnings model these factors were added to the traditional ones. When we controlled for family background and other characteristics, we found that age and schooling became insignificant. Furthermore, the quality of schooling, measured by the cognitive achievement levels of the workers, was not significant in predicting earnings. Thus, the results suggest that the traditional earnings models may have been so poorly specified as to be misleading. Furthermore, the new model is an improvement from the perspective of educational theory, statistical estimation procedures, and common sense.

Toward a New Strategy

Two themes have emerged from our review of Tunisian education. First, there are serious problems with the efficiency, effectiveness, and equity effects of past educational investment, and in many aspects they are similar to those found in other countries. Second, Tunisian officials and teachers not only are aware of these difficulties, but also have begun to take action, as is evidenced by the limitation of enrollment and the qualitative guidelines of the IVth plan. But this is not enough; to improve education in the future, a comprehensive investment strategy is needed.

To many decision-makers, however, the preparation and implementation of a new strategy call for difficult decisions. Their dilemma can be illustrated by two examples. First, the economic importance of limiting the expansion of enrollments is recognized, and significant steps have been taken at the secondary level to begin the process. Further restriction, however, of the number of places at the secondary or especially at the higher level is likely to be opposed by the middle and upper-income group who are strong supporters of the government, as well as by the poorer-income groups, whose educational opportunities might appear to be further limited.

Second, the importance of improving the relevance of the curricula and of planning the transition from school to work is again clearly recognized, but the dilemma exists of how to do this without endangering the prestige which the existing system enjoys, including the admission of its graduates into French schools and universities. To postpone such difficult decisions can only lead both to increasing the frustration for graduates of the system who fail to find employment of the kind they expect, and to increasing the inability of the system to supply the minimum manpower skills required. Since the issues are difficult, the solutions often controversial, and the problems still largely unresolved even in developed countries, a great deal of systematic experimentation by trial and error may be unavoidable. Some of the issues that require discussion for a new educational investment strategy are outlined below.

The two objectives that may continue to guide the government are improving the contribution of formal education to both (1) economic growth and (2) social equity. The strategy to achieve these objectives (Simmons, 1974) has three dimensions:

- (1) improve the effectiveness of educational investment by better understanding how schooling contributes to labor productivity, satisfaction, and socialization;
- (2) improve the probability of equal outcomes of schooling, as well as equal access, in order to reduce inequality and resource misallocation; and
- (3) Increase the participation of all social groups in educational planning and implementation so that formal education better fulfills their needs.

The basic principles which might guide planners are consistent with the new thinking over the last three years and seem likely to evolve further. To achieve the objectives, emphasis needs to be given to factors both within and without the educational sector in raising productive employment, ensuring an easier and less frustrating transition from school to work, and improving the income distribution effects. Formal education could increasingly be regarded as complementary to other learning activities within the community such as on-the-job learning.

The Tunisian educational system, which tries to satisfy both European standards of academic excellence plus the cultural and employment needs of Tunisia, has, in fact, produced a dualistic system. The issue of dualism suggests that decisions are required to study the needs for a culturally and economically relevant education, to experiment with the most attractive options, and then adopt the best.

Several issues are central to increasing the effectiveness of school investment. One is the extent to which the expansion of the supply of school places at the secondary and higher levels can be reduced. Given the present levels of students in the system, plus the increases projected for 1973-76, the system will produce dropouts and certificate holders at an increasing rate who will not find jobs to match either their school qualifications or aspirations. Useful policy mechanisms for controlling the supply of places may include both careful manpower planning and significant and increased involvement of potential employers, parents, and students in educational decisions.

An equally important issue for reducing the supply of places is reducing the pressures from the demand side. A major dimension in the social demand for school places is the artificially distorted wage differentials. There is little economic or social justification for a Tunisian mechanic being paid eight times the wage of an agricultural laborer, or a physician

earning one hundred times the laborer's wage. Is the labor of one man or women eight to one hundred times more essential to individual welfare and social development than the labor of someone else? To what extent is it possible to design a wages policy that narrows wage differentials? A second dimension is that education is practically a free good until the end of secondary, and for this reason demand for it has few constraints. The possibility of shifting more of the cost of education to the consumer, including subsidies for low-income groups needs serious study. A third dimension is use of school certificates by employers to screen job candidates. To what extent does this practice artificially inflate the demand for more years of schooling, especially for those jobs where the cognitive skills learned in school are not required on the job? Altering wage differentials, financial responsibility, and hiring practices is essential in reducing the social demand for school places.

Educational finance is a basic tool for reducing misallocation and improving equity. To what extent can the present mechanisms be reformed and new ones introduced? We have previously discussed the importance of shifting the burden of educational costs to the consumers and thus reducing the abuse of a "free" good. This would be consistent with the government objective of reducing Government monopoly in the economy. A basic issue is to what extent providing financial power to the consumers and letting them choose schools and tutors would improve the quality of the educational product. Essential to any scheme that increases private responsibility for educational costs are subsidies for low-income groups.

After agriculture and commerce, education employs more individuals than any other sector. Thus, marginal increments in the proportion of new jobs in education would have a significant impact on reducing unemployment among the educated. To what extent could the education sector, even at unchanged levels of expenditures, become a substantial source of new jobs? The largest and fastest growing pool of unemployed are between the ages of 15 and 25 and usually have a minimum of primary education. Could they be recruited to assist in teaching at minimum wage levels, considerably below current teacher wages? Student teachers could complement teachers in the classroom. Tutors on a one-to-one basis could concentrate on low-income children; this would supplement the extensive informal system of private tutors who now teach upper-income children. The effectiveness of these innovations could be evaluated. A key element in this experiment could be parent control over the selection and payment of the tutors. Over time, neighborhood parents would quickly determine the better tutors, and the tutors would be rewarded by higher income. The funding for the tutors would come from already budgeted funds which would have gone to hiring new full-time Tunisian and foreign teachers, or from a reduction over time in the real wage of present teachers, or from a system of financial credits available directly to parents and students.

Several issues are basic to improving the equity effect of educational investment. The present system of the examination of cognitive achievement, which is heavily biased toward French language ability, has the

effect of discriminating against rural and low-income students. More equitable and efficient ways to select students for secondary and higher education need exploration.

An initial skill required by technical workers is psychomotor ability, but students are not promoted for developing it. Furthermore, it is not correlated with high achievement in arithmetic or language. Thus, able students who could learn to be skilled technicians, if promoted to intermediate school, are excluded. Their talent is wasted. The same is true for students with math but not language ability. Some countries use other criteria for school promotion, such as regional and random quotas, or measures of personality such as motivation or social responsibility, either to substitute for, or to complement, cognitive achievement scores. Can experiments be undertaken to define more economical and equitable alternatives to this present selection system?

Several issues are central to improving school efficiency. The evidence in charts 2.2, 2.4 and table 2.10 suggests that the wastage rates are high, and that reading comprehension of primary graduates is poor. To what extent can internal efficiency be improved using available pedagogical methods or administrative tools? Raising the primary entry age, permitting students to re-enter after working several years, using student teachers, and involving parents merit study. The data in chapters 4 and 5, however, and also found in other countries (Simmons and Alexander, 1974) suggest that improving the quality of the school inputs may not significantly improve the cognitive outcomes. Furthermore, the evaluation of efficiency tends to concentrate on the cognitive outcome of schooling, while the noncognitive traits are probably more important for lifetime earnings or satisfaction. This evidence indicates that experimental efforts should be considered to explore both school and non-school innovations for rationalizing input-output processes, reducing wastage, improving reading comprehension, and developing noncognitive abilities.

Bilingual instruction during primary has been the subject of considerable debate in the past few years, but little evidence exists to suggest either how efficient or how fair the suggested alternatives are. Should instruction about the French language and instruction in French of other subjects be a major proportion of the primary curriculum as it is now? Could the last year of primary be entirely devoted to French to provide a total immersion course, the most efficient way to learn a language? Data should be collected and evaluated to provide insight for planners.

The Tunisian evidence on the determinants of child health, physical growth, and psychological development (Young, 1974), plus the implications that can be drawn from nutrition and child care research in other developing countries (Selowsky, 1972; Berg, 1973), suggest that the return to the investment in human resources may be high for the pre-school age groups. To what extent should increased emphasis be given to education of children and their parents before children reach the age of primary school? Basic

principles of hygiene, nutrition, parental behavior, and child learning are the essential components of any pre-school package. If parental and child education could be done in cooperation with the already widespread system of rural clinics and mobile health care units, then the cost could be low and the impact extensive. Given these basic issues we turn to the question of reform.

There are strong interests opposed to basic reforms of the educational system. Although most politically powerful groups, including the teachers and the middle-income parents, argue in favor of the minor modifications, as they do in other countries, there is little consensus or concerted action. Exceptional political initiatives at both the ministerial and parent level will be needed to overcome successfully, and with a minimum of disruption, the pressures of the various groups now wielding educational power. Political courage will need to be reinforced by an imaginative formulation of a comprehensive strategy and program and full participation of teachers and parents.

While there are existing pressures, mainly financial, for a basic reform of the educational system, most politically powerful groups argue instead for minor tinkering within the system. These groups include: the better-educated, who think that if their education was good enough for them, it is good enough for their children, particularly if it is on a European model; the teachers and administrators, who view any major change as a threat to their careers; and the parents of middle- and upper-income students, who under a more equitable system of student selection, would have less chance of access to higher education than they now have. Only a concerted action at the Council of Ministers level could successfully overcome, and with a minimum of disruption, the pressures of the various groups now wielding educational power. The chances for successful reform depend, therefore, on both realistic solutions and political courage.

Implications for Future Research

Research studies, much to the annoyance of policy-makers, usually conclude by stating that: (1) to understand more fully the issues discussed in the present study, more research should be undertaken, and (2) to base policy decisions on the research conclusions of the study would be premature. This study will not be an exception. Words of caution are needed to prevent abrupt changes in policy without a minimum amount of consistent data and analysis. Furthermore, while observers may consider the present system to be costly and ineffective, are the alternatives any better? Too often new programs replace old ones, based on dislike of the old and ignorance of the new. This is as true in the United States as it is in Tunisia or Tanzania, as the failure of the U.S. programs to affect low-income groups in the 1960s exemplifies.

An important research issue is, what constitutes a "minimum amount of consistent data and analysis" that is acceptable as research pertinent for educational policy decisions? Is research around the world on educational processes a legitimate pool of information? Or, is only research done within

a culture, a country, or a school valid for decisions about those entities? The evidence used to test the models in this study supports the conclusion that cross-cultural variations are minor compared to the similarities. There is greater variation within a society than there is across societies. Evidence from other social sciences supports this conclusion (Simmons, 1974). We would assert, therefore, that as educational models are more widely tested, the similarities will expand. The "minimum consistent data and analysis" may be approaching a sufficient level for educational policy decisions if both a judicious use is made of existing research in developed and developing countries, and the lacunae are filled by adequately designed and coordinated studies. The educational research of the past thirty years, and particularly the decade of the 1960s, has brought insight into the schooling and learning processes that will take decades to explore and apply (Bruner, 1963; Gintis, 1971; Carnoy, 1974; Jencks, 1972).

We tested four basic models relating to the role of schooling in development. In the order they were treated they were:

- (I) the factors contributing to student and worker cognitive achievement (chapters 4 and 5);
- (II) the factors contributing to the modernity of students and workers (chapter 6);
- (III) the factors contributing to the retention of cognitive achievement (chapters 5 and 7); and
- (IV) the factors contributing to worker productivity measured by monthly earnings (chapter 8).

The implications for future research depend partially on the previous research done with these models, and the consistency of the present findings. Model I, in different forms, has been widely used with students but not with workers (Alexander and Simmons, 1974). Model II has been used with workers in a less comprehensive form, but not with students (Inkeles, 1974). Model III is a new one. Although Model IV is an innovation, its simplest forms, as discussed chapter 8, have been widely used. Our results tend to be consistent for the models that have been previously tested. The importance of this has been noted above. To understand more fully the phenomena that the models attempt to describe, significant theoretical and empirical research is needed. For policy decisions, however, we would not expect further research in the next ten years to alter basically the general conclusions for models I, II, and III. Model III, which has been used for the first time, should be replicated.

Finally, our results suggests ideas for further research. First, the methods of testing the models should move from the cross-sectional approach to the longitudinal and the experimental. These techniques, basic to the

medical and physical sciences, need wider application in educational policy research. Use of these methods has been limited, owing to the unspecified nature of the theoretical models, the inexperience with the necessary quantitative and survey techniques, and high cost.

Second, empirical research using innovative models should normally begin with small samples. In the future the data could be collected by social class origin, by urban-rural birth, by amount of education, and by occupation. While the results from limited samples are not as useful for policy decisions as national surveys are, the advantage is their lower cost and faster analysis. They are essential preconditions for executing national surveys.

Third, the importance of case studies in depth should not be overlooked in the scramble for quantitative results. For educational policy studies, they should include students, workers, parents, teachers, and educational officials. In fact, in planning survey studies the case studies should be used to both refine the models and instruments before the data is collected, and after the analysis has been made as a means of verifying and extending the results. Most surveys would have been much more useful for policy decisions if the techniques of case study research and analysis had been systematically combined.

Finally, the testing of these models, and others relating to educational policy, should enjoy some form of coordination in order to optimize the returns to investment in educational research. The experiences of the International Wheat and Maize Improvement Center (CYMMIT, Mexico) and the International Rice Institute (IRI, Philippines) in increasing crop yields should not be limited to agricultural research. In contrast, most educational research has been notable for the lack of comparable results. (For more discussion of research directions, See Appendix I).

Implications for Policy

The world crisis in formal education is a real one. On the surface it may take the form of street corners filled with unemployed school-leavers, striking teachers, student riots, or the relapse of millions into illiteracy. Less obvious to the observer than these symptoms are our results, which suggest that some schools are doing little to promote individual or social welfare, including equal educational opportunity or outcomes, better incomes, or higher productivity.

The first and easily perceived level of the crisis has stumped most planners and politicians. Resources do not exist to put everyone in school for as long as each student would like. Jobs do not, and will not exist, even for students who are now finishing school. Thus, the traditional solutions are exhausted. The evidence of this study, when supported by data collected in other countries, indicates that the second and covert level of the crisis is equally serious, with implications so sweeping for both educational policy and social change that one hesitates to make further suggestions.

But planners who argue that a goal of educational policy should be to provide more and better secondary schooling need to question the assumption on which this goal is based. The probability is that such a policy, if carried out along traditional lines without significant political change, will increasingly work against, and not for, children.

The first implication for future policy is to confirm the seriousness of the crisis. Common sense, as well as the research suggested above, can be useful here. The next implication is to establish several alternative strategies for making schooling better serve society than it does now. Given the conditions of Tunisia, evidence from this study would support investment strategies that give increased emphasis to primary schooling at the expense of secondary higher schooling and give increased investment control to parents and students.

The final implication is that sufficient political courage and power are necessary to start and sustain a program that will increase the participation of the necessary interest groups in the planning and management of learning systems. Power, the ability to act, is the essential question **mark for the future, not mountains of supporting evidence carefully researched; for the reform of the schooling process is a threat to the status quo that has extensive political implications.** With a few exceptions like Cuba and China, educational reforms have brought much fanfare in other countries, including Spain in the late 1960s and Ethiopia in the early 1970s, but few concrete improvements in individual cognitive achievement or social productivity (Simmons, forthcoming).

To improve most educational systems several dilemmas require understanding. First, more equal educational opportunities - in fact, compensatory opportunities - would mean, for example, that a smaller proportion of university places would be open to the children of the elite, assuming that the educational budget would not grow substantially. Second, low-income groups could perceive some types of reforms as cutting off their only avenue of social mobility, if the reforms were not managed fairly. Third, the education establishment, including teachers, officials, and liberal intellectuals, could see the reforms as a giant step away from "civilization" because some "standards" set by Europeans will no longer be Tunisian standards. Further more, some of their children will be the ones who will yield their places at the secondary and higher levels to make room for students from low-income families. As much as improved equality and development may be the goals of the socialist states, it is the social revolution the elite will try to avoid if it means lowering the chances for their children. The past can be prologue, or it can suggest how learning can be reintroduced into the schools.

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Demeersman

Khatabi

APPENDIX A

Achievement Tests and Scales

The Scholastic Achievement Tests

In the context of this study, literacy was taken to mean the basic skills learned through formal education in Tunisia - i.e., literary Arabic, French, and arithmetic. Three short tests were administered to measure the respondents' proficiency in each of the areas. The arithmetic test was made up of 5 items, and the Arabic and French tests of 6 items each. The items on the arithmetic test were open-ended, and the respondents (Rs) supplied the correct answer. The Arabic and French tests were tests of comprehension of the multiple-choice type. Each item was made up of a short passage, a question on the passage, and three alternative answers to the question, one of which the R picked as the correct answer. The items were evaluated by assigning a score of 0 to a blank response or incorrect answer and 1 to a correct answer. The score of an R on a given test was the sum of his scores on the items.

The three tests were item analyzed, separately for the two samples, rural and urban, with respect to item difficulty and item discrimination. For both samples none of the tests had items poor enough that their exclusion from the test would leave the reliability unaltered. Therefore, all the tests were retained in the form in which they were administered.

For the rural sample from Tadjerouine, the Kuder-Richardson 20 (KR20) reliability for the arithmetic test was .67, for the Arabic test it was .69, and for the French test it was .65. The tests administered to the urban sample from La Goulette proved to have higher reliability scores. The arithmetic test had a reliability of .71, the Arabic .74, and the French .78. These scores are adequate for our purposes.

TABLE A.1

130 Arithmetic Test

1. Addition
 2. Multiplication with decimal
 3. Litres in a decalitre
 4. Litres in a hectolitre
 5. Wheat problem
-

TABLE A.2

131 Arabic Test (English Translation) /a

- Q) Habib Bourguiba is the president of the Tunisian republic. Who is the President of the Tunisian Republic? /b
1. Ahmed ben Salah
 2. Bahi Ladgham
 3. Habib Bourguiba
- 1) Since our grandfather has grown old, he became ill. Our father went to town to find a doctor. Who went to town?
1. our grandfather
 2. our father
 3. the doctor
- 2) The child entered the garden and found a dog. The dog barked and the child was afraid. What did the child do when the dog barked?
1. entered the garden
 2. was afraid
 3. found
- 3) With the creation of the technical school in the village, the factories and businesses are able to find qualified technicians and workers. What are the students at the technical school learning?
1. music
 2. reading and writing
 3. a skilled trade
- 4) During the months of the crisis, Great Britain was quietly awaiting the time of her intervention, without that preventing her from continuing her contacts with the interested parties. When was Great Britain awaiting her intervention?
1. the time
 2. during the months of the crisis
 3. quietly

/a All sentences are in modern standard Arabic except the sixth, which is a version indialectical Arabic of the fourth.

/b This was a preliminary question to demonstrate the procedure.

5) At the end of the Aglabite rule, the propaganda for the Fatimid state expanded; the Berbers were supporting the state because they did not occupy administrative or military positions in the Aglabite rule. What did the Berbers want from the Aglabite state?

1. propaganda
2. money
3. positions

6) During the days of the events England was quietly awaiting the time to intervene, although this did not prevent her from maintaining her contacts with the two opposing countries.

1. time
2. during the days of the events
3. quietly

TABLE A.3

132 French Test (English Translation)

- 1) Tomorrow my father will take me to school.

Question

Where will my father take me?

Reply

1. house
2. to school
3. to the movies

- 2) Tunisia is today independent after having been colonized.

Q

How is Tunisia today?

R

1. independent
2. beautiful
3. colonized

- 3) Until the beginning of term, the classroom was quite empty.

Q

What was quite empty?

R

1. the street
2. the classroom
3. the beginning of term

- 4) Where I cross the road, I have to look right and left to be careful and not throw myself in front of a car.

Q

What do I have to do when I cross the road?

R

1. not look
 2. throw myself in front of a car
 3. look at both sides
- 5) In spite of the speed of the train, I arrived late at school.

Q

What was the speed of the train?

R

1. late
 2. rapid
 3. slow
- 6) Non-nuclear countries have doubts about the value of a guarantee that is entirely based on two powers, when the agreement between them both is not certain.

Q

How is the value of this guarantee considered by non-nuclear countries?

R

1. sure
2. doubtful
3. between two great powers

TABLE A.4

SES Socioeconomic Status Scale

Items

Kind of house
Number of rooms in the house
Father's education
Father's occupation
Total family income

TABLE A.5

128 Role of Women

Items

Prefer to choose own wife
Dowry not necessary
Let wife/daughter work

TABLE A.6

133 Overall Modernity

Items

Let wife/daughter work
Prefer to choose own wife
Planning important for country
Years of schooling desirable
Change harvest methods on son's advice
Think of public problems often
Interest in world news
Understand stranger's thinking
Man without religion can be good
Belong to organizations
Read newspapers
Know where Moscow is
Know where Washington is
Know who Hassan II is
Know who Bahi Ladgham is

	Rural	Urban
Average inter-item correlation	.171	.220
Average item to scale correlation	.375	.443
K-R 20 reliability	.757	.820

TABLE A.7
136 Use French

<u>Items</u>		
Speak French		
Read French newspapers		
Read French magazines		
Read French books		
Write letters in French		
	Rural	Urban
Average inter-item correlation	.332	.374
Average item to scale correlation	.469	.512
K-R 20 reliability	.71	.76

TABLE A.8

137 Need Achievement Sentence Completion

Items

For my family to live better, it is necessary

My greatest hope is

In the next five years I am going to

To have a better life I need

In order to earn a good salary in life it is necessary

A good man is one who

Today to find a good job, it is necessary

If my situation gets worse, I must

I would like my oldest son

Today to succeed at the secondary school it is necessary

Note: All responses scaled 0-3, low to high achievement.

TABLE A.9

138 Urban Contact (for Rural Sample Only)

<u>Items</u>	
City near/far	
Size of city	
Years spent in city	
How often visit city	
Average inter-item correlation	.533
Average item to scale correlation	.648
K-R 20 reliability	.78

APPENDIX B

A Guide to Regression Analysis

The main method of data analysis is the estimation of stepwise regression equations. This method enables us to examine, for example, the effect of years of schooling on Arabic test scores while holding constant the student's age and his parents' social class. While the simple correlation coefficient (r) between years of schooling and test score might be high, it is also likely that the simple correlations between score and age, and then score and parental social class, are also high. Regression analysis assists in suggesting which of the three independent variables we have mentioned affects test score more strongly than the others. 1/

The effect of the independent variables, such as parental socioeconomic status, is measured by the Beta and regression coefficients. The larger the coefficient, the greater the effect. The statistical significance of these coefficients is measured by the "t" statistic, with the two-tailed test. When there is the probability "p" that the coefficients are going to be insignificant in more than 5 opportunities out of in 100 owing to random error, we omit the coefficient from our discussion in the text. All Beta coefficients, however, that were estimated in the final regression equation are found in the appendix tables. When the probability (p) is less than 5 chances in 100, we attach an (*) to the "t" statistic. When it is less than one chance in 100, we use (**).

The tables in the text give the "direction" of the variable, that is, whether it has a positive or negative effect on the dependent variable. For example, if the direction of the socioeconomic status is positive, then we can say that the higher the family status, the higher the Arabic score, controlling for the effects of the other variables. If the sign were negative, we would say that the higher the family status, the lower the Arabic score. The second column of information in the tables is labeled "variance." This is the unique variance in the final equation that each variable explained of the total variance in the dependent variable with all the variables included. For example, if the variance is .12 for socioeconomic status, we can say that socioeconomic status accounts for, or explains, 12 percent of the variance in the sample's Arabic score. Note that the total variance is seldom more than 30 percent (see table 4.8). Thus much of the variance is unexplained.

The reasons for unexplained variance include error in the measurement of the variables and the omission of important variables. The major omission is a measure of the students' cognitive ability when they entered school.

1/ For a discussion of the technique in more detail see Blalock (1972) or Draper and Smith (1966).

On the basis of research completed after this data was collected (Bowles, 1969), we would have predicted this measure to have been significant. It would have partially captured the effects of malnutrition, intelligence, dyslexia, and the effects of parental behavior. On the other hand, since we were primarily concerned with the inputs of only several schools, there was less chance than there would have been in a nationwide survey that variation in the school inputs across the schools within each of the communities could have affected our results.

By visiting the schools, we confirmed that the variation among schools within the community was minimal. Thus it was a reasonable assumption. One of the reasons that the analysis of rural and urban were separate was that the schools in the urban community had higher quality inputs, including foreign teachers for French and more materials in the classroom.

The final equation is the result of the estimation of three or four previous equations. The previous equations are not presented for chapter 4, but they are for chapter 5 (three for the achievement regressions, and four for the earnings). In appendix C are listed the 4 factors: schooling, work experience, home background, and personality. Each factor is measured by a number of variables, the data for which were collected by interviewers using a questionnaire on a sample for students and workers in the two communities. We regressed the dependent variables, Arabic score, for example, on all the variables in factor one. We then extracted from that equation only those variables that were significant of the, 0.05 probability level. This procedure was then repeated for each of the factors. The significant variables from each factor equation were then pooled to estimate our final equation. It is this equation that appears in the appendices to the chapters.

Although the theory of the recursive models presented in the chapters implies a chronological ordering of the effects of the independent variables, we did not force variables into the equation to replicate this ordering. For example, the effect of parental socioeconomic status comes before schooling as it affects earnings. Although this approach was tried with several final equations, it did not give significantly different results.

APPENDIX C

Description of Variables Grouped by Four Factors

I: Background Variables

Description

1. Frequency of father's urban visits (Tunis for urban, Kef for rural sample) (0 = never/1=1-2 times a year/2=3-12 times a year/3=13-49 times a year)
2. Frequency of mother's urban visits (coded same as #1)
5. Number of people living at home
6. Number of persons per room (number of people living at home divided by number of rooms)
7. Number of siblings
8. Father's age
9. Years father spent at kuttab
11. Mother's age
12. Years mother spent in primary school
14. Father's monthly salary in dinars
15. Father owns farm (0=No/1=Yes)
17. Number of people supported by family income
18. Per capita family income (people supported by family income divided by family income)
19. Father's employment during last 12 months (1=none/2=1 day to 1 month/3=2-6 months/4=6 to 10 months/5=11 months to entire year)
20. Father uses extra money for saving (0=No/1=Yes)
21. Father uses extra money for family living expenses (0=No/1=Yes)
22. Father uses extra money for education (0=No/1=Yes)

23. Father uses extra money for leisure (0=No/1=Yes)
24. Father reads newspapers (0=No/1=Yes)
25. Father reads books, magazines (0=No/1=rarely/2=Yes)
26. Frequency of father's movie attendance (0=never/
1=1-2 times a year/2=3-12 times a year/3=13-49
times a year/4=once a week or more)
27. Frequency of mother's movie attendance (coded same as #26)
28. Father listens to radio (1=almost never/2=now and
then/3=often)
29. Someone in family prays (0=Yes/1=No)
30. Father supervises son's education (0=No/1=Yes)
31. Mother supervises son's education (0=No/1=Yes)
32. Both parents supervise son's education (0=No/1=Yes)
33. Others supervise son's education (0=No/1=Yes)
- SES Socioeconomic status scale (see appendix A)
41. Living at home (0=Yes/1=No)
42. Respondent's age
43. Place of birth
44. Marital status (1=Yes/2=No)
45. Father living (1=Yes/2=No)
76. Family helps with homework (0=No/1=Yes)
77. Non-family member helps with homework (0=No/1=Yes)
78. Helper's education (0=no help/1-6=levels of education)
79. Type of help with homework (0=no help/1=encouragement/
2=explanations, exercises, etc.)

II: Schooling Variables

- 46. Age at entering primary
- 47. Grades repeated
- 48. Changed schools (1=Yes/2=No)
- 49. Post-primary school in city (1=No/2=Yes)
- 164. Kuttab (0=did not attend/1=attended)
- 165. Secondary school levels
- 166. Technical school levels
- 53. Apprenticeship center levels
- 54. Primary school levels
- 60. Years out of school
- 72. Tutoring (1=Yes/2=No)
- 130. Arithmetic Score (0-5)
- 131. Arabic Score (0-6)
- 132. French Score (0-6)

III: Job-Related Variables

61. Years had job
62. Occupational status (0=none/1>manual worker, farmer, or member of cooperative, semi-skilled worker/2=military service, skilled worker, tradesman, low-level official/3=boss, student, teacher, middle-level official/4=principal, professor, professional, high-level official, political office holder)
63. Employment during last 12 months (0=none/1-irregular/2=2-9 months/3=10-12 months)
64. Salary in dinars
65. Length of employment
66. Looked for work (1=Yes/2=No)
93. Schooling helps work (0=No/1=Yes)
94. Work requires reading-writing (0=No/1=Yes)

IV: Behavioral-Attitudinal Characteristics

64. Father influential with son (0=No/1=Yes)
68. Influence of siblings on brother (0=No/1=Yes)
69. Teacher, non-relative influential (0=No/1=Yes)
57. Left school owing to background factors (0=No/1=Yes)
58. Left school owing to bad performance (0=No/1=Yes)
59. Left school owing to bad school (0=No/1=Yes)
71. Unjustly punished at school (1=No/2=rarely/3=often)
73. Noise a problem in homework (0=No/1=Yes)
74. Lighting a problem in homework (0=No/1=Yes)
75. Lack of help a problem in homework (0=No/1=Yes)
80. Wants son to be like boys at school (0=No/1=Yes)
81. Improve schools by helping the poor (0=No/1=Yes)
82. Improve schools by supervised activities (0=No/1=Yes)
83. Improve schools by better communication (0=No/1=Yes)
84. Improve schools by more discipline (0=No/1=Yes)
85. Improve schools by better facilities (0=No/1=Yes)
86. Students fail because of family reasons (0=No/1=Yes)
87. Students fail because of social reasons (0=No/1=Yes)
88. Students fail because of individual reasons (0=No/1=Yes)
89. Students fail because of school reasons (0=No/1=Yes)
90. Skill-education necessary for stable job
91. Minimum education necessary for suitable job (1=education not necessary/2=1-5 years of primary/3=primary diploma/4=1-2 secondary/5=brevet diploma/6-first part of baccalaureat/7=second part of baccalaureat)

95. Job compared to father's (1=worse/2=same/3=better)
96. Job suited to ability (1=Yes/2=No/3=other)
97. Status of job expected in ten years (coded same as #62)
98. Status of job desired (coded same as #62)
99. Desires job for power (0=No/1=Yes)
100. Desires job suitable to education (0=No/1=Yes)
101. Desires humanitarian job (0=No/1=Yes)
102. Leave town for better job (0=No/1=Yes)
103. Uses extra money for savings (0=No/1=Yes)
104. Uses extra money for family living expenses (0=No/1=Yes)
105. Uses extra money for education (0=No/1=Yes)
106. Uses extra money for leisure (0=No/1=Yes)
110. Frequency of movie attendance (0=never/1=1-2 times a year/
2=3-12 times a year/3=12-49 times a year/4=once a week or
more)
111. Listens to radio (1=almost never/2=from time to time/3=often)
113. Best friend a relative (0=Yes/1=No)
114. Member of organization/club (0=No/1=Yes)
115. Participation in organization/club (0=none/1=irregular/
2=passive/3=active/4=directive)
116. Cultural activities for distraction (0=No/1=Yes)
117. Watches T.V. (0=never/1=rarely/2=3-8 times a month/
3=almost every day)
118. Gets news from friends (1=No/2=rarely/3=Yes)
119. Reads Arabic newspaper (1=never/2=from time to time/
3=regularly)
122. Last time read book (1=over a year ago/2=7-12 months ago/
3=1-6 months ago/4=8 days to 1 month ago/5=one day to one week ago)

- 123. Remembers all news (0=No/1=Yes)
- 124. Writes letters in Arabic (0=No/1=Yes)
- 126. Last time wrote letter (coded same as #122)
- 127. Municipality should increase educational activities for young
(0=No/1=Yes)
- 128. Role of women (see appendix A)
- 133. Level of overall modernity (see appendix A)
- 136. Uses French (see appendix A)
- 137. Need for achievement (see appendix A)
- 138. Urban contact (see appendix Q)

Appendix D

Appendix Table D.1

	Distribution Of Cognitive Achievement Scores							Absolute	
	Percentage							Mean	STD
	Low	0	1	2	3	4	5		
<u>Rural (n 44)</u>									
Arithmetic	2	7	7	16	34	15	-	3.75	1.31
Arabic	2	5	2	14	25	21	32	4.43	1.53
French	2	2	7	14	36	27	11	4.07	1.31
School Levels								7.93	1.93
<u>Urban (n 88)</u>									
Arithmetic	1	5	2	24	34	34	-	3.88	1.12
Arabic	5	3	6	10	14	32	30	4.36	1.71
French	1	1	1	6	23	42	26	4.78	1.12
School Levels								8.50	2.20
<u>Sum Achievement</u>	<u>0-2</u>	<u>3-5</u>	<u>6-8</u>	<u>9-11</u>	<u>12-14</u>	<u>15-17</u>		<u>Mean</u>	<u>STD</u>
Rural	2	2	7	20	43	25		12.25	3.55
Urban	1	0	3	18	45	31		13.02	2.79

Appendix Table D.2

Statistics
Rural School Sample
 n44

<u>Schooling</u>	<u>coded</u>	<u>mean</u>	<u>Std. dev.</u>
50 Kuttab	0,1	.16	.37
54 Primary level	4-6	5.93	.33
51 Secondary level	years	1.57	1.97
52 Technical level	years	.36	.86
47 Primary grades repeated	0-6	1.43	1.09
53 Apprentice center	years	.07	.26
46 Age school entry	years	6.57	1.04
130 Math score	0-5	3.75	1.31
131 Arabic score	0-6	4.43	1.53
132 French score	0-6	4.07	1.32
<u>Background</u>			
40 SES	2 trans.	.83	.49
15 Father radio	0,1	.43	.50
02 Mother urban visits	0-5	.89	1.17
43 Urban birth place	0-2	.14	.35
<u>Personality</u>			
68 Siblings' influence	0,1	.11	.32
114 Organization experience	years	1.70	2.23
73 Homework noise	0,1	.14	.35
113 Relative best friend	0,1	.48	.50
117 TV exposure	0-3	1.52	1.02
42 Age	years	16.07	2.03

Annex Table D.3

Rural Schooling and French Achievement

Dependent Variable: French Achievement

<u>Independent Variables</u> (Schooling only)	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>1X'X1</u>
51 Secondary School	.43	.35	1.96	1.00
52 Technical School	.12	.22	1.51	.90
53 Apprentice Center	.12	.22	1.53	.84
72 Tutoring	-.27	-.22	-1.53	.80
48 Changed Schools	-.24	-.21	-1.47	.77
46 Age at Entering Primary	-.27	-.20	1.25	.61
54 Primary School	.17	.13	.40	.55
50 Kuttab	.12	.11	.69	.43
47 Grades Repeated	.03	-.11	-.69	.32

Constant	2.81
R ²	.40
F for Equation	2.50
N Observations	44.00

Significance Levels: **: t 0.00; P .01
 * : t 0.00; P .05

Appendix Table D.4

French Regression for Rural Students

Dependent Variable: French Achievement.

<u>Independent Variables</u>	<u>Beta</u>	<u>t</u>	<u> X'X </u>
51 Secondary School Levels	.58	3.00**	1.00
114 Member of organisation	-.38	-3.37**	1.00
68 Influence of siblings with student	-.31	-2.61*	.97
52 Technical School levels	.34	2.08*	.85
111 Listen to radio	.19	1.57	.75
71 Unjustly Punished	.17	1.36	.54
42 Age	-.18	-.93	.16

Constant 4.61

R² .61

F for Equation 7.88

N Observations 44

Significance levels: **: t 0.00; P .01
 *: t 0.00; P .05

Appendix Table D.5

Rural Schooling and Arabic Achievement

Dependent Variable: Arabic Achievement

<u>Independent Variables</u> (Schooling only)	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> X'XI </u>
46 Age Entered School	-.42	-.34	-2.01	1.00
52 Technical School <u>levels</u>	.18	.27	1.73	1.00
51 Secondary School <u>levels</u>	.32	.21	1.09	.76
53 Apprentice Center	-.20	-.13	-.82	.69
72 Tutoring	-.14	-.08	-.50	.65
54 Primary School <u>levels</u>	.15	.12	.79	.59
47 Grades Repeated	.01	-.12	.71	.45
48 Changed Schools	-.06	-.09	-.58	.41
50 Kuttab	.00	-.05	-.31	.32
Constant		4.51		
R ²		.31		
F for Equation		1.73		
N observations		44.00		

Appendix Table D.6

Arabic Regression for Rural Students

		<u>Beta</u>	<u>t</u>	<u>X'X</u>	<u>U.V.</u>
46	Age at School Entry	-.02	-.19	1.00	.00
121	Read in Free Time	.34	2.82**	.99	.08
2	Urban visits of Mother	.46	3.59**	.77	.13
43	Place of Birth	.32	2.75**	.67	.08
73	Homework Problems: Noise	.40	3.35**	.59	.12
86	Why Student Fails: Family	.24	2.10*	.50	.05
15	Father is Farmer	-.18	-1.55	.42	.03
113	Best Friend is a Relative	.22	1.87	.32	.04
75	Homework Problem: help	-.18	-1.56	.26	.03

Constant .99
R² .65
F for Equation 6.92
N Observations 44

Significance

** t 0.00;
* t 0.00;

Appendix Table D.7

Rural Schooling and Arithmetic Achievement

<u>Independent Variables(Schooling only)</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>X'X</u>
52 Technical School level	.27	.45	2.93**	1.00
51 Secondary School level	.26	.28	1.53	.90
53 Apprentice Center	-.23	-.20	-1.30	.84
50 Kuttab	.23	.18	1.14	.74
47 Grades Repeated	-.13	-.16	-.98	.69
48 Changed Schools	-.15	-.15	-.99	.67
54 Primary School level	.04	-.09	-.61	.57
72 Tutoring	.02	.06	.39	.46
46 Age at School Entry	-.15	-.06	-.33	.32

Constant	6.00
R ²	.34
F for Equation	1.91
N Observations	44

→
Significance

* * t < 0.00; p < 0.00

* t < .00; p < 0.00

5/16/62
627.1945

Appendix Table D.8

Arithmetic regression for Rural Students

Dependent Variable : arithmetic achievement.

<u>Independent Variables</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>X'X</u>	<u>U.V.</u>
123		.31	2.34*	1.00	.08
85	Improve School facilities	.41	3.18**	.99	.14
25	Father reads books or magazines	.29	2.34	.04	.08
52	Technical school	-.22	-1.70	.82	.04
88	Why student fails: individual	-.21	-4.68	.72	.04
23	Wrong use leisure	-.16	-1.35	.69	.03
29	Kind of help on homework	.14	1.13	.65	.02

Constant	3.24
R ²	.50
F for Equation	5.04
N Observations	44

Appendix Table D.9

Statistics
Urban School Sample
n88

<u>Schooling</u>	<u>mean</u>	<u>Std. dev.</u>
50 Kuttab		
54 Primary level	5.91	0.33
165 Secondary level	2.02	2.19
166 Technical level	0.40	0.90
164 Kuttab years	1.05	1.42
47 Grades repeated	1.88	1.29
46 Age school entry	6.11	0.61
53 Apprentice center	0.08	0.35
130 Math		
131 Arabic		
136 French		
140 Total Levels Schooling		
 <u>Background</u>		
18 Per capita income	6.89	5.95
28 Father radio	2.05	0.82
35 Parents ed.	1.60	0.49
12 Mom ed.	0.90	1.89
37 Father's salary	2.27	1.23
29 Someone prays	0.35	0.48
26 Father movies	1.09	1.27
40 SES	0.39	2.77
 <u>Personality</u>		
133 Modernity	9.68	3.89
134 Mass Media	4.22	1.57
137 Need Achievement	4.61	1.86
136 Use French	2.82	1.52
109 Speaks French	3.41	0.83
74 Homework problems; light	0.03	0.18
70 Should teacher punish	1.85	0.53
116 Distraction	0.48	0.50
91 Minimum ed.	4.49	2.08
128 Role of women	5.99	1.42
68 Mom (other relative)	0.11	0.32
81 Improve School aid to poor	0.14	0.34

Appendix Table D.10

Urban Schooling and French Achievement

Dependent Variable: French Achievement

<u>Independent Variables (Schooling only)</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>X'X</u>
165 Secondary Level	.38	.27	2.02*	1.00
54 Primary Level	.26	.16	1.37	.93
47 Grades Repeated	-.30	-.11	-.92	.65
46 Age at School Entry	-.08	-.05	-.44	.64
48 Changed Primary School	.07	.04	.37	.59
53 Apprentice Center	-.04	-.02	-.24	.58
166 Technical Level	-.13	-.03	-.26	.43
164 Kuttab Years	-.07	-.02	-.24	.34
Constant		1.87		
R ²		.19		
F for Equation		2.28		
N Observations		88		

Appendix Table D.11

French Regression for Urban Students

	<u>Beta</u>	<u>t</u>	<u>X'X</u>
136 Uses French	.23	2.25*	1.00
74 Lighting a problem in Homework	-.27	-3.12**	.99
28 Father Listens to Radio	-.27	-2.84**	.98
25 Father Reads Magazines and Books	.29	3.04**	.86
18 Family per Capita Income	.25	2.55*	.81
6 Persons per Room at home	.24	2.61*	.69
165 Secondary Schooling levels	.12	1.11	.45
83 Improve School: by better communication	-.12	-1.28	.39
106 Use extra money for leisure	.10	1.06	.31
Constant		3.89	
R ²		.46	
F for Equation		7.33	
N Observations		88	

Appendix Table D.12

Urban Schooling and Arabic Achievement

Dependent Variable: Arabic Achievement

<u>Independent Variables(Schooling only)</u>	<u>Full Equation</u>			
	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>X'X</u>
54 Primary Level	.35	.30	2.59 *	1.00
165 Secondary Level	.30	.35	2.63 *	.93
47 Grades Repeated	-.08	.20	1.67	.65
46 Age School Entry	.11	.12	1.18	.64
48 Changed Primary School	-.16	-.10	-.94	.59
166 Technical Level	-.05	-.07	.57	.46
53 Center	-.01	-.01	.05	.43
164 Kuttab Years		-.06	-.54	.34
Constant			-7.88	
R ²			.22	
F for Equation			2.83	
N Observations			88	

Appendix Table D.13

Arabic Regression for Urban Students

Dependent Variable: Arabic Achievement

		<u>Beta</u>	<u>t</u>	<u>X'X</u>
12	Years Mother spent in Primary School	-.39	-4.28**	1.00
54	Primary School Level	.21	2.25*	.99
18	Per capita Family Income	.19	1.99	.94
164	Secondary School level	.20	2.02*	.83
1	Frequency of Father's urban visits	-.18	-1.92	.78

Constant	-1.88
R ²	.36
F for Equation	9.06
N Observations	88

Appendix Table D.14

Urban Schooling and Math Achievement

Dependent variable: Math achievement

<u>Independent Variables (Schooling only)</u>	<u>Full Equation</u>			
	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>X'X</u>
47 Grades repeated	-.30	-.28	-2.23*	1.00
46 Age School Entry	-.15	-.15	-1.35	.99
166 Technical Level	.08	.17	1.41	.96
48 Changed Primary School	-.10	-.06	.50	.90
165 Secondary Level	.17	-.00	.44	.55
53 Center	-.09	.06	.04	.54
54 Primary Level	-.09	.03	.27	.52
164 Kuttab Years	.13	.01	.06	.43
Constant		5.77		
R ²		.14		
F for Equation		1.62		
N for Observations		88		

? -x

Appendix Table D.15

Arithmetic Regression for Urban Students

	<u>Beta</u>	<u>t</u>	<u>X'X</u>
133 Level of overall Modernity	.19	2.02*	1.00
81 Improve School: Aid poor	.31	3.23**	.99
47 Grades Repeated	-.20	-2.17*	.89
101 Desire Humanitarian Job	.19	2.16*	.88
79 Advanced Job Desired: Personal	.13	1.38	.81
71 Unjustly Punished	-.14	-1.42	.78
22 Money Use: Education	-.18	-1.94	.74
29 Someone Prays	-.19	2.01*	.62
28 Father Radio	-.17	-1.80	.50
18 Family Income per Capita	.12	1.29	.40

Constant	3.72
R ²	.44
F for Equation	6.08
N for Observations	88

Table: E.1

Best Predictors of School Output among BACKGROUND Variables
for RURAL School-Leavers.

Dependent Variable: French Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx' </u>
28 Father listens to radio	.447	.440	3.12	1.00
78 Helper's education	.385	.376	2.66	.99

Constant .191

R² .342

F for equation 8.56

N observations 36

Table: E.2

Best Predictors of School Output among SCHOOLING Variables
for RURAL School-Leavers.

Dependent Variable: French Achievement

<u>Independent Variable:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx' </u>
54 Primary school levels	.610	.610	4.48	1.00

Constant .421

R² .372

F for equation 20.11

N observations 36

Table: E.3

Best Predictors of School Output among BEHAVIORAL-ATTITUDINAL
Variables for RURAL School-Leavers

Dependent Variable: French Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>1xx1</u>
133 Overall modernity	.606	.688	5.72	1.00
128 Role of women	.361	.429	4.23	.99
110 Frequency of movie attendance	.477	.383	3.53	.85
118 Get news from friends	.085	-.377	-3.37	.67
69 Teacher, non-relative influential	.256	.330	3.17	.66
91 Minimum education necessary for suitable job	.252	-.301	-2.48	.42

Constant -1.673

R² .731

F for equation 13.16

N observations 36

Table E.4: DETERMINANTS OF FRENCH ACHIEVEMENT
AMONG RURAL SCHOOL-LEAVERS
(All factors combined)

Dependent variable: FrenchAchievement

Independent variables:	r	Beta	t	IX X
54 primary school levels	.610	.328	3.02	.100
133 overall modernity	.606	.368	2.96	.84
128 role of women	.361	.444	4.05	.82
28 father listens to radio	.447	.348	3.00	.57
118 get news from friends	.085	-.232	-2.10	.44
Constant	-4.107			
R ²	.719			
F for equation	15.35			
N observations	36			

Table: E.5

Best Predictors of School Output among BACKGROUND Variables
for RURAL School-Leavers.

Dependent Variable: Arabic Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
28 Father listens to radio	.520	.485	3.58	1.00
76 Family helps with homework	.410	.362	2.67	.99

Constant .315
R² .400
F for equation 11.01
N observations 36

Table: E.6

Best Predictors of School Output among SCHOOLING Variables
for RURAL School-Leavers.

Dependent Variable: Arabic Achievement

<u>Independent Variable:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
54 Primary school levels	.415	.415	2.66	1.00

Constant 1.730
R² .172
F for equation 7.06
N observations 36

Table E.7

Best Predictors of School Output among JOB-RELATED Variables
for RURAL School-Leavers

Dependent Variable: Arabic Achievement

<u>Independent Variable:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>1xx1</u>
65 Length of Employment	.385	.385	2.43	1.00

Constant 3.230

R² .148

F for equation 5.90

N observations 36

Table E.8

Best Predictors of School Output among BEHAVIORAL-ATTITUDINAL
Variables for RURAL School Leavers

Dependent Variable: Arabic Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>1xx1</u>
133 Overall modernity	.665	.723	7.14	1.00
88 Student fails for individual reasons	-.303	-.455	-4.61	.99
138 Urban contact	.065	-.340	-3.22	.84
123 Remembers author	.308	.322	3.25	.77
71 Unjustly punished at school	.194	.202	2.08	.73

Constant 1.846

R² .735

F for equation 16.60

N observations 36

Table E.9: DETERMINANTS OF ARABIC ACHIEVEMENT
AMONG RURAL SCHOOL-LEAVERS

Dependent variable: Arabic achievement

Independent variables:	r	Beta	t	XI' XI
133 overall modernity	.665	.590	5.56	1.00
88 students fail because of individual reasons	-.303	-.303	-2.92	.99
76 family helps with homework	.410	.279	2.64	.95
123 remembers author	.308	.214	2.34	.91
Constant	1.279			
R ²	.674			
F for equation	16.02			
N observations	36			

Table: E.10

Best Predictors of School Output among BACKGROUND Variables
for RURAL School-Leavers.

Dependent Variable: Arithmetic Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xy </u>
78 Helper's education	.394	.307	2.46	1.00
28 Father listens to radio	.374	.515	3.96	.99
7 Number of siblings	-.350	-.372	-3.01	.98
21 Father uses extra money for living expenses	.247	.366	2.80	.86

Constant 1.396

R² .534

F for equation 8.88

N observations 36

Table E.11

Best Predictors of School Output among BEHAVIORAL ATTITUDINAL
Variables for RURAL School-Leavers

Dependent Variable: Arithmetic Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>lxxl</u>
133 Overall modernity	.499	.371	2.68	1.00
82 Improve schools with supervised activities	.449	.342	2.46	.88
105 Use extra money for education	-.150	-.307	-2.33	.83
67 Father influential on son	-.396	-.273	-2.06	.78

Constant 1.676

R² .492

F for equation 7.53

N observations 36

Table E.12: DETERMINANTS OF ARITHMETIC ACHIEVEMENT
AMONG RURAL SCHOOL-LEAVERS

Dependent variable: Arithmetic achievement

Independent Variables:	r	beta	t	X'XI
133 overall modernity	.499	.445	3.83	1.00
78 helper's education	.394	.315	2.76	.99
7 number of siblings	-.350	.341	-3.00	.99
67 father influential on son	-.396	-.308	-2.62	.90
105 use extra money for education	-.150	-.248	-2.18	.87
Constant		2.776		
R ²		.62		
F for equation		9.97		
N observation		36		

Table: E.13

Best Predictors of School Output among BACKGROUND Variables
for URBAN School-Leavers.

Dependent Variable: French Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
17 Number of persons supported by family income	.307	.316	3.20	1.00
42 Respondent's age	.264	.275	2.78	.99
Constant		-1.771		
R ²		.170		
F for equation		8.70		
N observations		88		

Table E. 14

Best Predictors of School Output among SCHOOLING Variables
for URBAN School-Leavers

Dependent Variable: French Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
54 Primary school levels	.521	.376	4.14	1.00
48 Changed schools	.347	.270	3.13	.97
165 Secondary school levels	.355	.200	2.30	.91
46 Age at entering primary	-.327	-.185	-2.04	.78
Constant		4.743		
R ²		.421		
F for equation		15.08		
N observations		88		

Table: E.15

Best Predictors of School Output among JOB-RELATED Variables
for URBAN School-Leavers.

Dependent Variable: French Achievement

<u>Independent Variable:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
93 Schooling helps work	.332	.332	3.26	1.00
Constant		2.921		
R ²		.110		
F for equation		10.66		
N observations		88		

Table: E.16

Best Predictors of School Output among BEHAVIORAL-ATTITUDINAL
Variables for URBAN School-Leavers.

Dependent Variable: French Achievement

Independent Variables:

		<u>Beta</u>	<u>t</u>	<u> xx </u>	
136	Use French	.717	.813	10.46	1.00
124	Write letters in Arabic	.008	.159	2.22	.95
81	Improve schools by helping poor.	.224	.168	2.40	.94
95	Job compared to father's	.168	-.187	-2.44	.77
74	Lighting a problem in homework	.124	.144	2.06	.75

Constant 1.852

R² .609

F for equation 25.52

N observations 88

Table E.17: DETERMINANTS OF FRENCH ACHIEVEMENT
AMONG URBAN SCHOOL-LEAVERS

Dependent variable: French achievement

Independent variables	r	Beta	t	IX XI
136 use French	.717	.625	7.59	1.00
54 primary school levels	.521	.186	2.51	.78
17 number of people supported by family income	.307	.171	2.58	.76
48 changed schools	.347	.196	2.91	.71
74 lighting a problem in homework	.124	.151	2.28	.70
95 job compared to father	.168	-.157	-2.18	.57
Constant	.381			
R ²	.658			
F for equation	25.98			
N observations	88			

Table: E.18

Best Predictors of School Output among BACKGROUND Variables
for URBAN School-Leavers.

Dependent Variable: Arabic Achievement

<u>Independent Variables:</u>		<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
29	Someone in family prays	-.316	-.420	-4.18	1.00
SES	Socio-economic status scale	.195	.273	2.75	.99
1	Frequency of father's urban visits	-.077	-.307	-2.83	.88
32	Both parents supervise son's education	.123	.216	2.09	.76

Constant 4.983

R² .236

F for equation 6.41

N observations 88

Table: E.19

Best Predictors of School Output among SCHOOLING Variables
for URBAN School-Leavers.

Dependent Variable: Arabic Achievement

<u>Independent Variables:</u>		<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
54	Primary school levels	.416	.359	3.72	1.00
165	Secondary school levels	.346	.272	2.82	.95

Constant 1.110

R² .244

F for equation 13.68

N observations 88

Table: E.20

Best Predictors of School Output among JOB-RELATED Variables
for URBAN School-Leavers.

Dependent Variable: Arabic Achievement

<u>Independent Variable:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
94 Work requires reading/writing	.220	.220	2.09	1.00
Constant		2.911		
R ²	.048			
F for equation	4.36			
N observations	88			

Table: E.21

Best Predictors of School Output among BEHAVIORAL-ATTITUDINAL
Variables for URBAN School-Leavers.

Dependent Variable: Arabic Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
98 Status of job desired	.496	.396	4.82	1.00
126 Last time wrote letter	.342	.243	2.92	.98
137 Need for achievement	.348	.253	3.16	.96
85 Improve schools by better facilities	.149	.195	2.34	.95
81 Improve schools by helping poor	.254	.185	2.24	.87
124 Write letters in Arabic	.320	.171	2.00	.73
Constant		-1.938		
R ²	.498			
F for equation	13.40			
N observations	88			

Table E.22: DETERMINANTS OF ARABIC ACHIEVEMENT AMONG
URBAN SCHOOL-LEAVERS

Dependent variable: Arabic achievement

Independent variables:	r	beta	t	X' XI
98 status of job desired	.496	.335	4.06	1.00
126 last time wrote letter	.342	.165	2.00	.99
137 need for achievement	.348	.199	2.52	.97
29 someone in family prays	-.316	-.249	-3.16	.92
124 write letters in Arabic	.320	.300	3.59	.82
165 secondary school levels	.346	.199	2.31	.63
Constant	-0.481			
R ²	.535			
F for equation	15.51			
N observations	86			

Table : E.23

Best Predictors of School Output among BACKGROUND Variables
for URBAN School-Leavers.

Dependent Variable: Arithmetic Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
42 Repsondents age	.321	.333	3.46	1.00
17 Number of persons supported by family income	.232	.257	2.66	.99
30 Father supervises son's education	-.223	-.242	-2.51	.99

Constant -1.722

R² .220

F for equation 7.92

N observations 88

Table: E.24

Best Predictors of School Output among SCHOOLING Variables
for URBAN School-Leavers.

Dependent Variable: Arithmetic Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
54 Primary school levels	.533	.475	5.34	1.00
165 Secondary school levels	.375	.276	3.11	.95

Constant .362

R² .357

F for equation 23.56

N observations 88

Table: E.25

Best Predictors of School Output among JOB-RELATED Variables
for URBAN School-Leavers.

Dependent Variable: Arithmetic Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
66 Looked for work	-.325	-.298	-2.98	1.00
94 Work requires reading/writing	.269	.234	2.34	.98
Constant		2.815		
R ²		.160		
F for equation		8.09		
N observations		88		

Table: E.26

Best Predictors of School Output among BEHAVIORAL-ATTITUDINAL
Variables for URBAN School-Leavers.

Dependent Variable: Arithmetic Achievement

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
133 Overall modernity	.546	.387	3.79	1.00
124 Write letters in Arabic	.209	.330	3.98	.98
136 Use French	.500	.334	3.23	.60
Constant		-.086		
R ²		.447		
F for equation		22.68		
N observations		88		

Table E.27: DETERMINANTS OF ARITHMETIC ACHIEVEMENT
AMONG URBAN SCHOOL-LEAVERS

Dependent variable: Arithmetic achievement

Independent variables	r	beta	t	IX XI
133 overall modernity	.546	.384	5.16	1.00
54 primary school levels	.533	.352	4.87	.91
30 father supervises son's education	- .223	.259	- 3.80	.90
124 write letters in Arabic	.209	.239	3.42	.85
66 looked for work	- .325	- .161	2.35	.80
165 secondary school levels	.375	.155	2.11	.66
17 number of people supported by family income	.232	.142	2.10	.64
Constant	-1.433			
R ²	.648			
F for equation	21.05			
N observations	88			

Table: F.1

Best Predictors of School Output among BACKGROUND Variables
for RURAL School-Leavers.

Dependent Variable: Overall modernity

<u>Independent Variable:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
28 Father listens to radio	.438	.438	2.84	1.00

Constant 3.709

R² .192

F for equation 8.09

N observations 36

Table: F.2

Best Predictors of School Output among SCHOOLING Variables
for RURAL School Leavers.

Dependent Variable: Overall modernity

<u>Independent Variable:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
54 Primary school levels	.401	.401	2.55	1.00

Constant 5.202

R² .161

F for equation 6.50

N observations 36

Table F.3: BEST PREDICTORS OF SCHOOL OUTPUT AMONG JOB RELATED VARIABLES FOR RURAL SCHOOL LEAVERS

<u>Dependent Variable:</u> Overall Modernity.				
<u>Independent Variable:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>1x'x1</u>
64 salary	.485	.485	3.24	1.00
Constant			7.567	
R ²	.236			
F for equation	10.48			
N observations	36			

Table F.4: BEST PREDICTORS OF SCHOOL OUTPUT AMONG BEHAVIORAL-ATTITUDINAL VARIABLES FOR RURAL SCHOOL-LEAVERS

<u>Dependent Variable:</u> Overall Modernity				
<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u>1X'x1</u>
104 use extra money for family living expenses	-.502	-.402	-3.69	1.00
118 get news from friends	.374	.381	3.73	.99
57 left school due to background factors	.333	.367	3.51	.98
136 association with French	.490	.318	3.03	.89
113 Best friend a relative	.264	.299	2.73	.74
Constant			5.516	
R ²	.837			
F for equation	14.09			
N observations	36			

Table: F.5

Best Predictors of School Output among BACKGROUND Variables
for URBAN School Leavers.

Dependent Variable: Overall modernity

<u>Independent Variable:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
42 Respondent's age	.510	.499	5.81	1.00
SES Socio-economic status scale	.258	.202	2.34	.99
29 Someone in family prays	-.251	-.245	-2.86	.97
6 Number of persons per room	-.211	-.221	-2.52	.90
8 Father's age	-.062	-.184	-2.14	.85

Constant 4.225

R² .426

F for equation 12.19

N observations 88

Table: F.6

Best Predictors of School Output among SCHOOLING Variables
for URBAN School Leavers.

Dependent Variable: Overall modernity

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
165 Secondary school levels	.350	.449	4.66	1.00
166 Technical school levels	.233	.319	3.37	.97
60 Years out of school	.152	.216	2.74	.93

Constant 7.703

R² .271

F for equation 10.42

N observations 88

Table: F.7

Best Predictors of School Output among JOB-RELATED Variables
for URBAN School Leavers.

Dependent Variable: Overall modernity

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
64 Salary	.425	.323	3.29	1.00
93 Schooling helps work	.417	.311	3.16	.89

Constant 7.768

R² .267

F for equation 15.45

N observations 88

Table: F.8

Best Predictors of School Output among BEHAVIORAL-ATTITUDINAL
Variables for URBAN School Leavers.

Dependent Variable: Overall modernity

<u>Independent Variables:</u>	<u>r</u>	<u>Beta</u>	<u>t</u>	<u> xx </u>
136 Use French	.606	.502	6.87	1.00
96 Job suited to ability	.420	.257	3.66	.96
119 Read Arabic newspaper	.153	.222	3.11	.93
86 Students fail because of family reasons	.382	.216	3.06	.88
57 Teacher, non-relative influential	.295	.184	2.57	.80
90 Skill-education necessary for stable job	.226	.174	2.48	.76

Constant 2.133

R² .623

F for equation 22.26

N observations 88

Annex Table: F.9

MODERNITY REGRESSION FOR RURAL STUDENTS

	Beta	t	1X'X1
Age	.23	1.91	1.00
Money use: education	-.21	-2.43*	.99
Need achievement	.29	3.10*	.95
Why student fails: family	.20	2.03	.83
Uses French	.32	2.81**	.58
Advantage of job desired: education	.25 .21	2.89** 2.43**	.57 .46
Organization experience			
Technical school	.19	1.82	.30
Money use: leisure	.23	1.31	.22
Constant	-2.48		
R2	.77		
F for equation	12.62		
n observations	44		

* $P < .05$.

** $P < .01$.

Annex Table: F.10

MODERNITY REGRESSION FOR URBAN STUDENTS

	Beta	t	IX'X1
Use of French	.37	3.94**	1.00
Secondary	.16	1.58	.72
Son likes boys at school	-.14	-1.75	.68
Mother goes to the movies	.16	2.04*	.63
Why student fails: family	.09	1.11	.59
Money use: leisure	-.17	-2.18*	.58
Mother's education	.17	2.08	.51
Father listens to radio	-.13	-1.71	.47
Father travels.	.13	1.58	.38
Age	.12	1.26	.22
Constant	-.95		
R2	.58		
F for equation	10.52		
n observations	88.00		

* P < .05

** P < .01

Annex Table F 11
Canonical Correlations

Number of Canonical Variate Sets	Corresponding Eigen values	Corresponding canonical correlation	λ	χ^2	degrees of freedom	Significance
1	.389	.353	.624	40.10	24	.020
2	.291	.578	.539	21.14	15	.150
3	.158	.815	.398	7.89	8	.400
4	.031	.968	.180	1.27	3	.650

Canonical Coefficients for Dependent Variables

	CANVAR 1	CANVAR 2	CANVAR 3	CANVAR 4
VAR068	-.008	.199	.984	-.220
VAR114	-.18	-.156	.075	.95
VAR040	.310	-.1899	.150	-.048
VAR057	.933	.357	-.065	.196

Canonical Coefficients for Independent Variables

	CANVAR 1	CANVAR 2	CANVAR 3	CANVAR 4
VAR013	.625	.487	-.089	-.353
VAR113	.480	.082	-.884	.257
VAR043	.452	-.222	.226	-.117
VAR002	.121	-.869	-.157	-.541
VAR015	.458	.0184	.400	.807
VAR117	.576	.165	.249	-.355

APPENDIX G

Tables for Chapter 8

Appendix Table G.1

Rural Statistics
(n 21)

<u>Variable</u>	<u>Coded</u>	<u>Mean</u>	<u>Standard Deviation</u>
64 Earnings	dinars	18.762	10.862
175 Schooling (GS)	grades	6.4	2.1
141 Schooling (YS)	year	8.8	3.4
42 Age	year	21.3	2.3
65 Length employment	year	3.2	2.2
53 Apprentice	year	0.4	0.8
164 <u>Kuttab</u>	year	1.3	2.2
72 Tutoring	year	1.0	1.1
54 Primary	year	5.5	1.4
51 Secondary	year	0.1	0.3
52 Technical (moven)	year	0.9	0.8
132 French achievement	0-6	3.8	1.5
131 Arabic achievement	0-6	4.3	1.5
130 Math achievement	0-5	3.3	1.2
137 Need achievement	0-5	3.1	1.7
133 Overall modernity	0-15	10.1	2.3
136 Uses French	0-5	2.2	1.4
124 Writes Arabic	0,1	0.9	0.4
94 Job reading	0-3	1.6	1.2
74 Insufficient light	0,1	0.3	0.5
90 Employed skill	1-3	1.9	0.8
44 Marital status		.19	.40
76 Help with homework: family		.38	.50
20 Money use: saving		1.71	.72

Note: 0 = No; 1 = Yes

Appendix Table G.3
Rural Earnings Regression

Dependent Variable: Earnings

<u>Independent Variables</u>	<u>r</u>	<u>Regression Coefficient</u>	<u>Beta</u>	<u>t</u>	<u>x'x</u>
53 Apprentice center	.63	-1.02	-.08	-0.36	1.00
136 Uses French	.62	3.43	.43	3.84**	.89
74 Light a problem for homework	.57	8.91	.40	3.33**	.73
76 Family helped with homework	.14	4.38	.20	1.59	.60
90 Importance of a skill for stable job	.44	5.23	.40	2.57*	.40
133 Modernity	.46	0.89	.19	1.22	.16
44 Marital status	.58	7.59	.28	1.82	.07
20 Father would save money	.20	2.88	.19	1.54	.04
54 Primary schooling level	.38	-0.52	-.07	-0.58	.03
Constant		-15.36			
F ₂ for equation		12.52			
R ²		.96			
n		21.0			

Appendix Table G.4
Urban Earnings Regression

Dependent Variable: Earnings

<u>Independent Variables</u>	<u>r</u>	<u>Regression Coefficient</u>	<u>Beta</u>	<u>t</u>	<u>x'x</u>
165 Secondary	.63	2.34	.22	2.41*	1.00
41 Living at home	-.44	-45.41	-.39	-4.99**	.99
42 Age	.42	3.49	.48	5.32**	.87
102 Leave at 20 dinar	-.54	- 4.95	-.13	-1.69	.66
76 Help with homework: family	.16	11.91	.21	2.97**	.57
66 Sought work	-.37	-14.59	-.24	-3.35	.51
31 Mother supervised education	-.15	- 8.79	-.23	-3.05	.42
16 Total family unions	.55	0.10	.33	3.78	.27
8 Father's age	.16	- 0.59	-.23	-2.89	.20
29 Someone in family prays	-.06	- 4.75	-.12	-1.68	.15
12 Mother's education	.11	9.88	.12	1.58	.11
67 Father's real influence	-.14	- 3.31	-.06	-0.95	.10
Constant		30.82			
R^2 ✓		.91			
F for equation		19.22			
N		37.0			

Note: The following variables did not enter the equation, but were part of the final pool of variables:

133 OM (r=.54) 137 Nach (r=.27) 54 Primary ed (r=.35)
91 minimum education (r=.41) 90 Stable employment (r=.03) ○

APPENDIX H TABLE 2.A

PROJECTED REQUIREMENT FOR NEW TEACHERS DURING FOURTH PLAN
1973-1976

	<u>1972</u>			<u>1973-1976</u>	
	<u>Stock</u> (1)	<u>Additional/ Year</u> (2)	<u>%</u> (3)	<u>Required/³ During Period</u> (4)	<u>New as % of Stock in 1972</u> (5)
Primary	19,145	674	4	2,698	14
Secondary	4,971 ¹	507	11	2,030	41
Higher	546 ²	154	29	616	113
Total	24,662	1,335		5,344	

- ¹ Of whom 40 per cent were French cooperants.
² Of whom 57 per cent were non-Tunisians.
³ This excludes any replacements for cooperants.

Source: Note de Synthèse du Plan, pp. 21-22

APPENDIX TABLE 2.B

PROJECTED BALANCE OF SECONDARY TEACHERS AT
END OF THE PLAN

(in teachers)

<u>Secondary</u> ^{a/}	<u>Excess</u>	<u>Deficit</u>
Arabic	637	-
History and Geog.	112	-
Math	-	551
French et al	-	420
Physics and Chemistry	-	114
Total	799	1,085

Source: "Note de Synthèse du Plan," p. 22

Notes: a) The Balance is based on the projected student enrollments and flows of teachers.

APPENDIX TABLE 2.C

PROJECTED CAPITAL EXPENDITURES: FOURTH PLAN

(Millions of Dinars)

	Plan					
	<u>1971/72</u> (1)	<u>Categ. A</u> (2)	<u>Categ. B</u> (3)	<u>Total</u> (4)	<u>Total Year</u> (5)	<u>Increase (Percent)</u> (6)
<u>Ministry of Education</u>						
Primary	1.1	6.7	1.2	7.9	2.0	87
Secondary	4.1	10.3	22.8	33.1	8.3	103
Higher	4.6	7.3	24.3	31.6	7.9	72
Total	<u>9.7</u>	<u>24.3</u>	<u>48.3</u>	<u>72.6</u>	<u>18.2</u>	<u>88</u>
<u>Ministry of Agriculture</u>						
Total	m	m	m	1.8	.5	-
<u>Ministry of Social Affairs</u>						
Total	-	-	-	0.4	.1	-

Source: "Note de Synthese du Plan," p. 25 ff.

Note: a Category A: classrooms (6-18 months to achieve in construction).

b Category B: food services, teacher housing, equipment, and classrooms (more than 18 months to achieve in construction).

c These tentative figures illustrate the rate of increase in spending by level, as there were no other data available. For example, the total for the period is projected in the final plan for 43.4 million dinars, not 72.6 as shown in preliminary document. (Fourth Plan, p. 207)

APPENDIX TABLE 2.D

PROJECTED CURRENT EXPENDITURES: FOURTH PLAN

(Millions of Dinars)

	1971/72	Plan Period	
		Total	Per Annum ^a
<u>Ministry of Education</u>			
Primary	21.5	102.7	25.5
Secondary	28.7	118.8	29.7
Higher	8.4	54.4	13.6
Administration	1.0 ^c	3.0	1.0
Total	59.6	279.9 ^d	70.0
<u>Ministry of Agriculture</u>			
Total	3.0 ^c	14.8	3.7
<u>Ministry of Social Affairs</u>			
Total	1.0 ^c	4.0 ^c	1.0 ^c

Source: "Note de Synthèse du Plan," p. 25 ff.

Notes: a The Ministry of Education expenditures increase at the rate of 19.5 percent/year over the plan period compared to base year 1971/72.

b Columns may not add, owing to rounding.

c Estimate.

d The final estimate is 255.2 million dinars, but the items do suggest the proportions (Fourth plan, p. 101).

APPENDIX I

Future Research

Our results suggest future research directions of both theoretical and policy interest. The basic theoretical problems involve the issues of how children and adults learn, how schools affect the learning process, and how schooling affects work performance.

For model I, (chapters 4 and 5) the small impact of schooling on achievement needs more intensive study. Better achievement tests should be designed, being careful to test skills useful to the individual and society, such as reading comprehension and problem-solving, rather than self-serving school exercises. Criterion referenced testing offers useful concepts. School grades should be collected for as many years of the student's career as possible. National achievement tests should also be used, such as the exam to enter secondary school. Both grades and national tests could be substituted for the specially designed tests as dependent variables in the model, in order to analyze differences among the determinants.

Our results suggest that the family and personality factors, especially attitudes and behavior of parents, IQ, and other aptitudes of the students, need more careful specification based on recent theoretical and empirical work than we were able to do. School inputs, such as teacher quality and class size, which were omitted from this study because of their probable insignificance, could be examined if only to confirm past work.

The samples should include the students and workers of high-income parents, omitted in this study. Ideally, students should be measured for ability, personality, and achievement on entry to school, and the results compared to later data. Experimental studies could examine the effect on the achievement and behavior of students and workers when rote teaching is complemented by a problem-solving or open-classroom approach.

For model II, which examined in chapter 8, the factors contributing to modernity, virtually all of the previous research has been for workers. Although Inkeles (1974) hypothesized that the impact of schooling on modernity should be similar to the impact of factories, better data on students are needed for comparison.

For model III, describing the factors contributing to retention, in chapters 5 and 7, two avenues of future research hold considerable promise. First, the personalities of the individuals should be more accurately defined, particularly in terms of ability and motivation. Second, the perceived and actual demands of the use of cognitive skills both at work and elsewhere need study. Future research should rely on longitudinal and experimental methods and avoid cross-sectional methods. The estimation of educational cost benefit ratios in the future should include an item for depreciation based on the probability of loss of cognitive skills.

For model IV in chapter 8, major improvements could be made in the dependent variables. Earnings are often not a good proxy for productivity, although they do estimate what is important to the workers. Measures of physical productivity should complement those of earnings. Supervisors' ratings (the measure essential for promotion), and a measure of worker satisfaction should be used as dependent variables (Simmons and Noerenberg, 1975). The model would also benefit from using better measures of worker personality, such as a peer rating, and a measure of vocational aptitude.

The samples to test model IV should include workers within occupations as well as data on hierarchically ranked occupations within and across firms. This will aid in determining, for example, the role that schooling plays in obtaining high-status first jobs (Alexander, 1975).

Additional subjects for research that are outside the narrow confines of the models, but are suggested by our results, include some of the following subjects.

Alternative learning processes to formal schooling should be explored. After all, unschooled men contributed to considerable economic and social progress before the introduction of mass education in the nineteenth century. Are school buildings, teachers, and a mass bureaucracy the only ways to teach the basic cognitive and behavioral skills?

One experiment would be to substitute for the present method of funding and managing primary education, a variation on the voucher system. Vouchers for hiring tutors would be distributed at no charge to low- and medium-income families. Teacher quality would be measured by the percentage of their students who passed the exams. Poor teachers - those with a low percentage - would eventually have few students or go out of business. Teaching could take place at home, or in rented rooms including schools. Thus, the tutor would have an incentive to get as many passed as possible, rather than the present incentive of dropping out as many as possible in order to make his or her classroom more manageable. The best teachers would attract the most students, and then would have to organize other tutors with less experience, but promise. No bureaucracy would be required to supervise the teachers. The costs would fall significantly and the benefits rise. Anarchy? Perhaps, when compared to the present strait-jacket, but if motivation is important for student learning, so it is also for teachers to perform well. A reward system based on ability rather than seniority would go a long way to increase the effectiveness of teaching. This kind of scheme would only work in countries and communities in which there were a few potential tutors who did not have the prospect of better earnings and job security elsewhere. But the number of unemployed secondary school-leavers is now high enough in most countries, and will skyrocket in the next several decades, to provide these tutors.

The benefits of this voucher system may be numerous. First, the communication between teacher and student may improve because the teacher need not feel that, because of certificates and civil-service status, he or

she is an "untouchable." Second, cooperation may replace fear as a learning mechanism. And how much better a behavioral trait is cooperation for encouraging the development of a productive and integrated individual than fear with its plethora of destructive syndromes. Third, if the teacher becomes ineffectual, parents may take their vouchers elsewhere, at once. Fourth, a large number of school-leavers, now unemployed and increasing the ranks of delinquents, could be gainfully employed, if we make three assumptions. First, because the number of teachers would substantially increase, the number of primary students per teacher in Tunisia would fall substantially from present levels, now about eighty for the first three years (based on two groups of students per day), and forty for the second three years. Second, the earnings of teachers under the new system would be about the same as they are now getting. And third, a large number of children who dropped out or were flunked out before reaching the last year of primary would come back to school.

The list of potential benefits continues. Fifth, enlarging the number of teachers from the ranks of the unemployed secondary leavers would mean that their basic skills would not tend to depreciate from lack of use, but rather appreciate. This passive, alienated group could become active, and their reintegration would contribute significantly to the human resource endowment of the country. Sixth, a loosely supervised system would mean that tutors would be better able to individualize teaching programs.

A second experiment relates to the decertification of the labor market. The goal would be to enable employers increasingly to hire workers on the basis of ability or potential trainability, rather than on the basis of certificates that have little or no relevance for most blue and white-collar jobs. In the United States, the first major step in decertifying the job market was illustrated by the U.S. Supreme Court decision in Griggs Duke Power, 1971, in which employers were prevented from requiring a high school diploma from potential employees.

In a third and simple experiment, schools or tutors could communicate information by visits to craftsmen to explain their work, and descriptions of other occupations and their requirements both awakening student's curiosity and an awareness of future job opportunities. Such encounters would be a useful learning device as well as an opportunity for interaction with adults.

Fourth, if tests for admission and selection procedures to secondary and higher schooling are biased in favor of upper-income students, then a fairer system should be developed to replace it. Experiments with quota systems and peer group screening are needed.

Fifth, the value of manual labor is perhaps the most forgotten category of skills in developing countries, and the most important from the criteria of national development. A student's entrance into secondary school means that for the rest of his student's life, he will scorn manual labor and see it as a second-rate occupation. That an "educated" person probably does

Not understanding the importance and satisfaction of craftsmanship is perhaps the costliest contradiction in the third world. Experiments in work study should take place at the secondary level, both mandatory and voluntary (Fussell and Qarmby, 1974). In voluntary programs, time lost from studies could be compensated for by giving the work-plan students a handicap on their exams, and thus boost their scores. This kind of program would eliminate the need for the wider range of costly and ineffectual apprentice centers. These functions should be either jointly shared by the firms and the government ministry responsible, such as industry, tourism, or agriculture, or else performed by the firms alone. Few countries in the world have developed effective vocational training outside the plant (Zymelman, 1974; Castro and Sousa 1974). Given the nature of civil-service salary levels and capital constraints, schools, by definition, seldom have equipment comparable to that of the firms or the same level of competent instructors. Perhaps the most beneficial aspect of work-study programs would be that the offspring of the elite, and others who are headed for positions of responsibility in the society, would have the opportunity to understand a little of the nature of manual work, workers, and their importance in society. This might be one way to avoid the tragic errors in "human engineering" that the elite commit in the name of social progress.

Note that this discussion is not about reform. Rather it suggests research and experimentation. If the experiments are successful, then investigation should begin about the nature of alternative reforms based on the research.

