Who Gets to Go to School?: Parental Schooling Choices Among the *Ariaal Rendille* of Northern Kenya.

by

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ABSTRACT

An enormous literature details the benefits of educating female children with respect to lowered fertility and infant/child mortality levels. Far less examined are patterns of parental decision-making with respect to selecting specific children for schooling. This thesis uses logistic regression methodology to delineate parental decision-making patterns concerning childhood education in the *Ariaal Rendille* community of *Karare, Marsabit* District, northern Kenya. Results reveal clear, predictable parental strategies reflecting specific household characteristics and larger cultural traditions.

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CHAPTER ONE

FEMALE EDUCATION: ISSUES, CONCERNS, AND PROBLEMS

1.1 Introduction to the Issue of Female Education world-wide and its positive impact on demographic rates

In terms of the developing world, female education is viewed as a viable pathway towards securing economic development, modernization and population control. For over two decades, research has attempted to evaluate the effects of female education on everything from fertility to household income to infant mortality and morbidity (Ballara 1991; Caldwell 1979,1980,1982; Hadden & London 1996, Mensch & Lloyd 1997, 1998; United Nations 1985, 1995). Results of several studies indicate girls and women who have had some degree of schooling do indeed have fewer children (Ainsworth et al. 1996; Bledsoe & Cohen 1993, Caldwell 1980, 1982; Datta 1987; Dudley & Pillet 1998; Hyatt & Milne 1992; Jain 1981; Leslie et al., 1986; Sadik 1990). According to Hadden & London (1996:33), generally speaking "the fertility depressing effects of education arise because better educated women are more frequent and effective contraceptors and marry at older ages than less educated women."

There is also a link between education, reduced fertility and reduced child mortality and morbidity (Bellew et al. 1992; Boerma 1987; Browne & Barrett 1991; Caldwell 1979, 1980; Cleland & Van Ginneken 1988; Hill & King 1993; Hertz et al. 1991; McGuire & Popkin 1990; Raut 1993; Sadik 1990; United Nations 1985). McGuire & Popkin (1990) point out:

> [Children of educated mothers] will be better fed and clothed, generally better cared for and therefore, healthier. In addition better-educated mothers will be more knowledgeable about health

> and safety risks and prevention, and about nutrition, all of which lower the mortality and improve the health of their children.

In addition to the positive aspects of reduced fertility and reduced child mortality, educated women have an impact on economic development and modernization. "There is considerable support for the proposition that increasing the education of girls results in both greater labour force participation in adulthood and higher earnings" (Hadden & London 1996:34). Other studies support this proposition (Anderson 1988; Bellow et al. 1992; Browne & Barrett 1991; Boserup 1986; Caldwell 1982; Herz et al. 1991; Jazairy et al. 1992; Pracharapoulos & Woodhall 1985;). Needless to say, educated women who contribute financially to a household enjoy more autonomy within that household. Figure One, taken from Dr. Alan Hedley's 1997 address to the 33rd World Congress of the International Institute of Sociology, held in Cologne, and entitled *Reducing the Gap Between North and South: A Universal Imperative* succinctly summarizes the returns resulting from female education.

1.2 Caldwell's Wealth Flow Theory

John Caldwell, a demographer from the Australian National University, was one of the pioneers in exploring the link between female education and reduced fertility, infant mortality and morbidity. In his 1979 study of infant mortality in Nigeria, Caldwell unbundled "education" from the previous four fold classification of political, social, sanitary and medical changes which had been suggested as influencing fertility rates as well as morbidity and mortality rates among children. Caldwell (1979: 396) concluded "that

mother's education could not be employed as a proxy for general social and economic change but needed to be explored in its own right."

Figure 1

DEVELOPMENT OUTCOMES RELATED TO EDUCATION BY GENDER

Private Returns

Market Factors:
Higher earnings

Nonmarket Factors:
Increased human capital
Higher social status
Greater occupational mobility
Increased self-determination
Older age at marriage
Greater fertility control
- Few children
- Better family health and nutrition
- Lower infant, child, and maternal mortality
- Longer life expectancy
- More attention given to children
- Greater gender equity of children
- Greater education of children
- Better employment prospects for children
- Improved quality of life

Public Returns

Market Factors:
Increased labour productivity
Greater technological innovation
More entrepreneurship
Higher GNP per capita
Faster GNP growth
More equitable income distribution
Less drain on government resources
- Shift from home-based to market-based work
- Higher taxes on earnings
- Lower dependency ratio (lower fertility and higher female labor force participation)
- More efficient use of public health services

Non-market Factors:
More political and civil liberties
More responsible consumers and citizens
Improved functioning of political process
- More informed use of natural resources
- Reduced population growth
- Healthier population (and future generations)
- Reduced incidence of disease (including AIDS)

- Greater returns from educating women than men.

Sources: Hedley 1997a; Hill and King 1993; Schultz 1993; Subbarao and Raney 1993; Summers 1994; World Bank 1991:52-69; 1993:42-51; 1995a.

In the Nigerian study, Caldwell (1979:404) looked at several social factors thought to have an impact on child mortality including, mother's occupation, father's occupation, area of residence, father's education, mother's education and type of marriage. Upon analysis he found "that maternal education is the single most significant determinant of these marked differences in child mortality" (Caldwell 1979:408). Caldwell however, at least in 1979, never fully explored the mechanisms of this influence.

In 1980, Caldwell published an article in Population and Development Review entitled *Mass Education as a Determinant of the Timing of Fertility Decline.* In this article, subsequently expanded in 1982 to become a book entitled Theory of Fertility Decline, Caldwell returned his attention to the mechanisms involved in female education and its impact on fertility decline and reduced infant mortality and morbidity. Caldwell (1980:225) proposed, "the greatest impact of education is not direct but through the restructuring of family relationships and, hence, family economies and the direction of the net wealth flow." This he argued, occurred through five mechanisms: 1) reducing the child's potential for work inside and outside the home, 2) increasing the cost of children beyond the fees, uniforms and other incidentals associated with getting an education, 3) creating children who become dependent on the family and society, 4) speeding up cultural change in the direction of the dominant culture and, 5) propagating the values of the dominant class (Caldwell 1980:227-228).

Caldwell notes in traditional Western society before the advent of public schools, (and one can add in the Third World as it stands today), the whole family worked together as a family production unit. Children were expected to contribute to the running of the household, and they were valued as members of the work force. Thus the more children in

the family the more efficient and productive the household. High fertility was the normal state of affairs. Indeed as Caldwell (1980:226) notes it was "regarded as honourable and a fulfillment of parents' duty to their elders." Thus it was part of the family morality. In this system the flow of wealth was upward from child to parent to grandparents (Caldwell 1980:226). However, with the introduction of the public school system and mandatory attendance, there was a change in the direction of net wealth flow; downward from grandparent to parent to child. Subtle changes in the family occurred with the advent of mandatory public education. These five "mechanisms" as Caldwell calls them, were mentioned briefly above but deserve further illumination.

The first mechanism argues that children attending school could no longer be expected to work inside and outside the home. Aside from the obvious time constraint, Caldwell (1980:227) proposes two other reasons for this phenomenon. Firstly, he argues, parents may discourage children from participating in traditional chores that are at odds with their new learning and status. Secondly, parents may feel that traditional familial work is beneath the status of a child who is so obviously going to be successful in the outside world. The second mechanism argues that besides the obvious expenditures associated with schooling there are additional costs to which the family has to attend as well. According to Caldwell (1980:227) parents have to pay for better clothes, food and other extras which allow the child "to participate equally with other school children." Caldwell (1980:227) also proposes that school children place more demands on their parents' time, energy, and resources. Demands which were unprecedented and which parents were loath to challenge for fear of alienating this 'new child' whose " authority is the new authority of the school and [whose] guides are the non-traditional ways of life that have been revealed."

The third mechanism sees children becoming more dependent, not just on their families to support them financially while they attend school, but on the state as well which values children for their future returns. "All these changes make children less productive and more costly both to the family and to the society. These changes also mean, "children no longer really share responsibility for the family's survival in the present" (Caldwell 1980:228).

The fourth mechanism sees an acceleration of cultural change. Caldwell (1980: 228) argues, "in the West, values of the school were clearly middle-class values, and the schools imposed as many of these on the working class as they could. Ultimately, the school agenda was that of the broader economy – capitalism.

The final mechanism worked its subtle magic on the family, by invoking nationalist sentiments. Caldwell (1980:228) notes that schools are the "major instrument for propagating the values, not of the local middle class, but of the Western middle class." Thus schools serve to alienate children from their traditional familial productive unit by turning them into citizens of the world.

Caldwell (1980: 245) points out "family production was controlled by family morality, which gave power to the old and usually to the male, and which frequently sharply differentiated production and consumption roles by age and sex." However, according to Caldwell's wealth flow model the introduction of compulsory universal schooling resulted in changes which served to produce a child-centred family. Instead of wealth flowing from child to parent to grandparent, in this new family morality wealth flowed downwards from grandparent to parent to child. More emphasis was placed on the needs and welfare of the child, because the child, in achieving an education, would be better equipped to cope in the

changing economy. The moral codes and traditions of the elder generation, which had guided and served the family under traditional modes of production where the family was both producer and consumer, no longer served the family because "schools destroy the corporate identity of the family, especially for those members previously most submissive and most wholly contained by the family: children and women" (Caldwell 1980:243).

In his treatise, Caldwell relates the mechanisms, which first appear as changes within the family unit, to the eventual reduction of fertility levels, child morbidity and child mortality. Caldwell (1980:228) notes, "the first two postulates [or mechanisms] are widely accepted, partly because they can be seen to operate even without the recognition of a major restructuring of the family morality. But it is probably the last three that have the most impact in changing family economies from a situation in which high fertility is worthwhile to one in which its is disastrous."

Using the *Princeton Index,* a compilation of census and demographic data providing dates for fertility declines in fifteen countries including, England, Wales, Netherlands, Belgium, Germany, Australia, Italy, Spain and Portugal, Caldwell finds support for his wealth flow theory. In all these countries' the fertility declines were predated by the enactment of compulsory school attendance legislation. "The advent of mass schooling in 15 or more countries in the late nineteenth century was close [in time] because of the transmission of the idea, while the nature of their economies and their per capita incomes varied widely. Significantly, the advent of their fertility declines was also close" (Caldwell 1980:237).

Provided school attendance is compulsory, the state can afford to provide public education, the infrastructure is in place to meet the demands of business, and the labour market can gainfully employ new graduates, then Caldwell's net wealth flow paradigm is a

valid explanation of the mechanisms which restructure family relationships and economies. However, in much of the developing world school attendance is not compulsory, the state does not have the resources to fund public education, the infrastructure for business is virtually non-existent and those students who do graduate cannot find employment. In the West it is important to note that mandatory public education came about at roughly the same time as the industrial revolution and the expansion of capitalism. The developing world has yet to see a widespread industrial revolution as was seen in the early 19th century.

1.3 Substantiating Claims and Proposed Pathways

Rowley (1993: 3) notes "every United Nations sponsored report on international development since the late 1960's has stressed the importance of universal literacy and has urged an end to the widespread gender disparity in school enrollment." These reports include the 1969 Pearson Report, the Brandt Report of 1987, 1992's Agenda 21, UNICEF's 1994 *The Progress of Nations,* and the United Nations 1994 "Conference on Population Development." Even the World Bank, thinking in practical economic terms, has hopped on the education bandwagon: "educating girls quite possibly yields a higher rate of return than any other investment available in the developing world (Summers 1992: 132; see also Schultz 1993, Summers 1994).

Despite these important co-relations, the actual pathways by which female education affects social and demographic parameters remains unclear (Cleland & Van Grinnikan 1989; Howson, Harrison, Hotra and Law1996; Bledsoe, Johnson-Kuhn, Haaga 1999; Lloyd and Mensch 1999).

In his study on child survival in developing countries Cleland (1988:1357) addresses the issue of mechanisms arguing, "little progress towards an understanding of practical or policy implications will be made until the mechanisms by which parental education, influences health and survivorship are identified." Cleland (1988: 1363) suggests that the mechanisms by which parental education have a positive impact on health and survivorship have little to do with increased income, or increased material resources or even access to modern health services. Rather, it appears that the benefits of parental education come in the form of attitudinal, behavioural, social and cognitive changes within the individual in turn resulting in positive outcomes for children in the family.

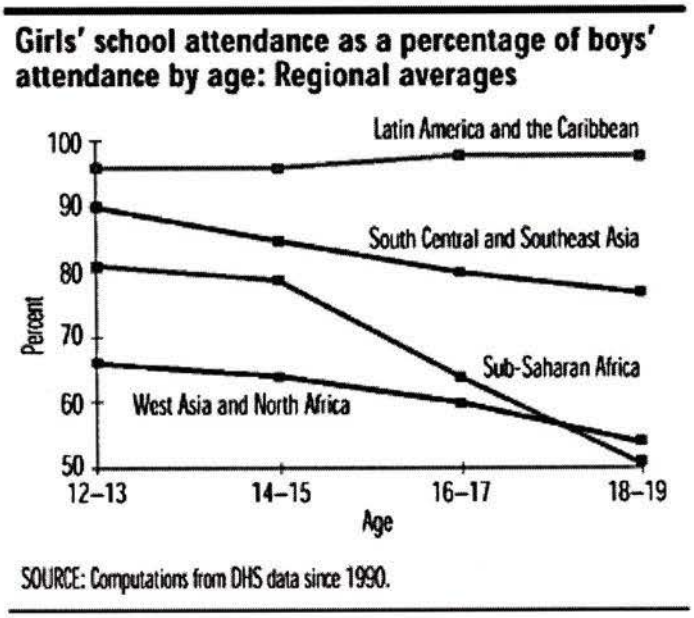
An example of a social change acting as a mechanism can be found in simple behavioural changes such as hand-washing before meals or having private baths rather than public bathing in the local river. These behaviours are often introduced to students during their schooling years. These new types of behaviours become socially desirable and continue into adulthood. This in turn influences the health of children often without conscious intent. Cleland (1988:1364) cites research done in Bangladesh which found that the major difference between educated and uneducated mothers was an emphasis on cleanliness by the former. According to Cleland, (1988:1364) "their houses and children appeared to be neater and cleaner and their desire for social gentility led to a preference for washing with tank or tube-well water at home, and to spurn public bathing in canals or rivers."

Cleland (1988:1366) concludes with a call for more research into the mechanisms noting "medical interventions by themselves will achieve only a modest impact. But, disclosure of the mechanism by which education influences survivorship could have important practical and concrete implications for health and educational policies."

1.4 Enrollment Rates for Female Children still Lag Behind Those of Boys

Although study after study has outlined the positive benefits of female education, and although development agencies and world congresses continue to call for more female education, enrollment rates for female children still lag behind those of boys in most developing countries. The gender gap continues to be substantial in Africa, the Middle East and South Asia (Nuss & Majka, 1985; Herz et al. 1991; Bellew et al, 1992; Hill and King 1993, Howson, Harrison, Hotra and Law. 1996). What then accounts for this disparity?

Figure 2 - Girls' School Attendance as a Percentage of Boys Attendance by Age: Regional Averages.



From Population Council at http://www.popcouncil.org/ppdb/schooling.html

According to Hill & King (1993:108), "ultimately, the reasons why women are seldom as well educated as men lie outside the educational system." Research has shown there are legitimate barriers to females attending school (Hill and King 1993; Mensch and Lloyd 1997; Lloyd and Mensch 1999). These include high tuition fees, lack of uniforms, lack

of female only schools, and lack of toilet facilities. However none of these are insurmountable, especially once the decision has been made to send a female child to school.

In addition Mensch and Lloyd (1997:35) note serious physical impediments which curtail girls' access to an education. They cite the lack of time to learn; the lack of material inputs (such as instruction materials, toilet facilities, water, electricity or transportation) the lack of extracurricular activities; and the lack of effective teachers and teaching.

However, in their examination of three primary schools in Kenya, Lloyd and Mensch (1999) suggest that the greatest obstacle to female education lies in the attitudes of teachers towards female students and the education literature which reinforces gender inequality in the society. Lloyd and Mensch (1999:92) cite numerous examples of policies and administrative practices that clearly favour male students. For example, boys are awarded more scholastic prizes, boys are not asked to leave school should they father a child yet girls are forced to leave, boys and girls have different uniforms, boys are allowed to leave their dormitories in the early evening but girls are expected to remain in their dormitories, boys are not compelled to kneel when speaking to teachers but this behaviour is demanded from girls. The curriculum also serves to discriminate against girls. Textbooks and teaching materials show a higher proportion of males to females, and "when women are depicted, they typically are in a position subordinate to men and are portrayed in fewer types of roles, and their physical appearance is assigned more importance than their achievement" (Lloyd and Mensch 1999:93).

Lloyd and Mensch (1993:95) also found that teachers tend to favour male students over female students. Teachers tended to describe boys as "responsible," "hardworking," "ambitious," "serious" and "scholarly" while girls were described as "less serious," "lazy,"

"timid," "more interested in their appearance" or "more interested in boys." In the final analysis Lloyd and Mensch (1999:98-99) point out that while in the economic and demographic literature, female education does appear to have a positive impact; on a social level the education females receive serves to "reinforce the gender inequalities present in the surrounding society." Women thus can never be anything other than wives and mothers. While an educated mother may take better care of her children, or be able to acquire marketable skills, in the current educational climate, she will not be an effective channel for radical social change.

1.5 How are Children Chosen to Attend School?

The great majority of research on female education focuses on the outcomes rather than the initial choices involved in determining just which child(ren), in any particular household, get(s) to go to school. Indeed, even before selecting the particular child who will be sent to school, the family has to make an initial conscious decision to participate in the schooling process, a process that, incidentally, may be incongruent with their own traditional way of life. Lloyd and Blanc (1996:267) concur:

> While governments – meaning generally the central government – play the primary role in the provision of schooling in Africa, parents and other family members play the deciding role in determining whether or not children actually enroll in school when it is available, and, if so, by what age. They also decide how long their children remain in school…Families serve as their children's gatekeepers through their control over children's access to the educational resources made available to them by the state.

In his 1982 publication, Theory of Fertility Decline, Caldwell (1982: 44) suggests a possible criterion -- individual potential -- as a reason for why children are chosen to attend

school. In essence, Caldwell is suggesting that the child who demonstrates the ability to succeed in the educational environment most likely will be chosen to attend school. Caldwell (1982:44) also suggests parents may select children randomly to attend school an event he refers to as a "lucky dip." While recognizing that a child's individual potential is a viable criterion for determining who gets to go to school, this research instead argues that culturally specific values and traditions including subsistence patterns, inheritance patterns, household labour characteristics and gender roles have a greater impact on determining which child(ren), if any, get(s) to attend school. Thus far the literature on this topic is rather limited; however, some researchers have addressed this question (Roth 1987; Niles 1989; Sathar and Lloyd 1994; Lloyd and Gage-Brandon 1994; and Lloyd and Blanc 1996). In 1987, Roth (1991) conducted research among isolated *Rendille* pastoralists living in the town of Korr in Northern Kenya in sub-Saharan Africa. Roth concluded (1991:140) "in the pastoralist sample, traditional *Rendille* values of sex and birth order, reflecting male primogeniture were the most important determinants [influencing parental decision-making in schooling choices]." Thus parental schooling choices were based not on the child's individual intellectual potential or ability, but on a cultural system which values males over females and first born male children over later born male children. This study indicated that the variables related to cultural traditions had a greater impact on which, if any, children attended school rather than variables related to economic status.

Working in Northern Nigeria, a predominantly Islamic region, Niles (1989) found that in rural areas, there were two main reasons why parents were reluctant to send female children to school. The first was religious grounds. "There is a lingering fear, especially among the illiterate, that education would expose their children to alien Christian influences.

Parents feel that Western-styled education is contrary to their faith and way of life" (Niles 1989:14)

According to Niles, (1989:14) the second impediment to female education is cultural. "The culture of the *Hausa* people defines the woman's role as primarily that of housewife, and many women are kept in seclusion. Girls are usually given in marriage as early as eleven and twelve years of age, so education seems to have little relevance for the role women are expected to play. Further, early marriage makes it impossible for a girl to receive even six or seven years of schooling." In this study it is clear that cultural traditions and practices are the final determinants in parental schooling decisions.

Using data from the 1991 Pakistan Integrated Household Survey, Sathar and Lloyd (1994) looked at the factors affecting primary school attendance among and within families in Pakistan. In their study, they concluded that mother's education and household income had the greatest impact on whether children were sent to school. However, the study further showed that it was male children who were more likely to be educated. "The most pervasive theme emerging from these results is the systematic disadvantage that girls face in Pakistan – a disadvantage which transcends the effect of most other variables. Parents prefer boys to girls and appear willing to provide far more for them in terms of schooling" (Sathar & Lloyd 1994:126). Thus while educated mothers may desire that all their children be educated, it appears that in the case of reduced economic surplus the choice is to send sons rather than daughters to school. This stems partly from the fact that Pakistan is a patriarchal society, where women are valued mainly as wives and mothers. Thus, while we see that a family's economic status determines *if* children in a particular family *may* attend school, a

cultural bias, favouring male children over female children influences *who* ultimately gets to go to school.

In another study sample, Lloyd and Gage-Brandon (1994) looked at the barriers affecting schooling opportunities for children in Ghana. Using data from the Ghana Living Standards Measurement Survey, Lloyd and Gage-Brandon (1994:301) ran multivariate statistical analysis to explore the statistical relationship between sibling size and children's educational outcomes. They determined that the variables, sex of child, birth order and number of siblings had an impact on whether children were selected to attend school and whether those attending school remained in school.

Because Ghana is a polygamous society, data were organized into two sample types: all children of household mothers and all children of household fathers. In terms of enrollment, the study found that in the mother-based sample "the number of younger siblings ha[d] no noticeable effect on enrollments" (Lloyd and Gage-Brandon 1994:302). However, with the father-based sample the number of younger siblings had a negative impact on school enrollments. This indicates the more younger siblings a girl has, the less likely she is to attend school. Further to this, fathers discriminated on the basis of birth order (first born) and sex of child (male) in determining who would be enrolled in school.

Lloyd and Gage-Brandon (1994:303) also found "among teenage girls, each additional younger sibling significantly increases the probability of girls dropping out of school." This effect was found mainly in the mother based sample suggesting woman are resigned to (or do not challenge) the traditional sex roles which see the burden of child care in Ghana, as well as most of sub-Saharan Africa, resting with themselves. Thus, with the addition of each new child to the family, mothers are more likely to make use of their

daughters as domestic labour or to provide child care rather than let them finish their schooling. The same rationale applied when Lloyd and Gage-Brandon measured educational attainment. "Educational attainment among teenage girls is negatively affected by the number of younger siblings in both samples, and the relationship is statistically significant. Each additional younger sibling has a statistically significant effect on the sex gap in educational attainment" (Lloyd and Gage-Brandon 1994:304)

Finally, Lloyd and Blanc (1996:272) examined the contributions of the extended nuclear family and its impact on school enrollments in seven sub-Saharan countries. Using data culled from Demographic and Health Surveys as well as their own survey on traditional household data, the authors were able to "analyze some of the key determinants of children's schooling." Results of the multivariate analysis show the variables: education of the household head, household standard of living, presence of other children in the household, nuclear family and sex of household head were key determinants of children's schooling. (Lloyd and Blanc 1996:284-289). In this analysis Lloyd and Blanc (1996) concluded the educational attainment of the household head as well as the household standard of living had the greatest impact on whether a child would be sent to school. They also found that children in female headed households "show universally better school outcomes, than children living in male headed households when households with similar resources are compared" (Lloyd and Blanc 1966:267).

Hill & King (1993:130) argue: "enough data are now available on most countries to describe fully how gender inequality manifests itself in the educational system. But more analysis is needed of the process – that is, of how females become disadvantaged – before effective remedial strategies can be designed. The analysis needs a multivariate approach."

Further to this the authors note that the "levels of attainment, achievement and wastage are all contingent [*firstly*] on the decision to enroll" (Hill & King 1993:109). However, it is hardly surprising that with such venerable bodies as the World Bank and the United Nations extolling the virtues of educating females, that the praise for female education and the research on the practice of female education remains locked in a self-fulfilling prophecy whereby research has focused primarily on substantiating the claims of reduced fertility, reduced child mortality and morbidity, increased autonomy and greater earning potential associated with higher levels of female education.

1.6 Thesis Statement

I will use demographic data collected from among *Ariaal/Rendille* pastoralists of northern Kenya to test the study proposition that culturally specific values and traditions including subsistence patterns, inheritance patterns, gender, birth order, age-set affiliation, wife number, and household wealth are the primary determinants in parental decision-making in selecting which children will be chosen to attend school. Selection of which children will attend school is not a "lucky dip" or "happenstance" as suggested by Caldwell in his fertility decline theory, but rather is predictable from a knowledge of *Ariaal* cultural patterns.

The preceding chapter explored the literature related to the positive co-relation between female education and decreased fertility, reduced child mortality and morbidity, increased autonomy, and increased earning capability. It also pointed out the dearth of studies devoted to the question of how parents determine which children will be selected to attend school. Chapter Two is devoted to illuminating the cultural traditions of the *Ariaal-*

Rendille of Kenya. Chapter Three is divided into two sections – Materials and Methods. Materials provide details on the town of Karare, and on subsistence patterns. The Methods section is concerned with predictions of which children attend school based on cultural patterns, method of analysis and a discussion of the dependent and independent variables. Chapter Four presents the results of the multivariate analysis in light of the predicted behaviours. Finally, Chapter Five begins with a discussion of political economy and its relevance to this study. It then explores some of the barriers to female education and ends with recommendations for further research.

CHAPTER TWO

ARIAAL CULTURE AND IDENTITY

2.1 Putting Education in Perspective in the Third World

In wealthy western countries parents do not have to decide to send children to school; the state makes that decision on their behalf. The state pays for the infrastructure and also makes most of the decisions concerning the content of the curriculum leaving parents little input into the process. In state operated public school systems, the erection of regional boundaries, districts and territories determine which school children will attend, again leaving parents with few options. In wealthy western countries there are, of course, a host of privately funded schools. Parents can opt to send their children to these schools provided they can afford the tuition fees. In the wealthy western world, unless a parent is providing educational instruction in the home, a form of education known as "home schooling," a parent who does not send a child to school, is considered negligent and is liable for legal prosecution (Bledsoe 1999:12).

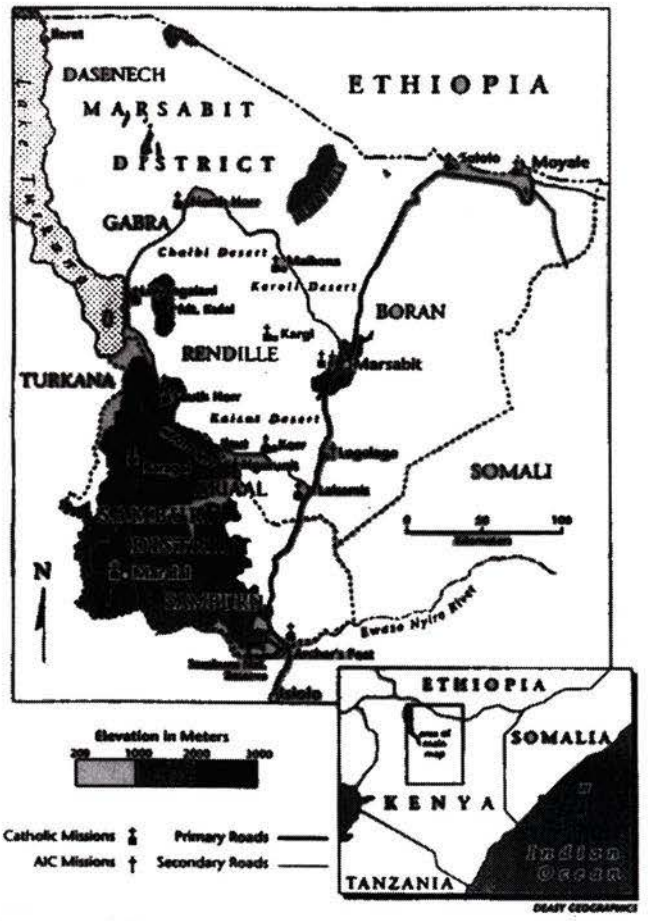
The above discussion does not apply in poorer countries. Despite attempts by UNESCO and other development agencies calling for universal primary education in Asia, Latin America and Africa by the year 1980, the goal of universal education is still a distant dream for most developing nations in the world (New Internationalist - August 1999: 28). Indeed, in terms of world spending on education, in 1995, Africa accounted for 1% of the total, South Asia 4%, East Asia 4%, the Arab States 2% and Latin American 5%. The developed world on the other hand contributed 84% to the total (New Internationalist - August 1999: 28). Obviously, there is nothing "universal" about primary education in the

Third World. Thus, at least, in the Third World, parents have to make numerous decisions about schooling. Provided parents have made the initial decision to participate in the schooling process parents still have to make a decision regarding who will be sent to school. As Bledsoe (1999:13) notes, "across the world, unequal access to education, whether by gender, by perceived ability, or by class is the rule rather than the exception."

How then do parents make that decision? In order to assess how parents make that decision, Fuller and Liang (1999: 184) argue that researchers need to look at "how household level processes and institutional arrangements operate simultaneously to condition intra-family decision making." This chapter serves to illuminate those household level processes or key determinants in *Ariaal* society which impact on parental decision making. The chapter has been organized into sections with each section presenting information on a key determinant. Thus there are discussions centered on the history of the *Ariaal*, pastoralism, gerontocracy, the age-set system, women's role in society, the Nykeri tradition and inheritance patterns. These key elements serve to illustrate the role intra-family dynamics play in the decision making process. In turn these key elements provide the foundation for the parental decision making predictions against which the 1996 demographic data collected from among the *Ariaal/Rendille* will be tested in order to substantiate the thesis statement that cultural factors influence parental decision-making.

2.2 Ariaal Rendille Pastoralists

Figure 3 - Map of Kenya



Fratkin & Smith: African Pastoralist Systems © 1994, pg. 98

Ariaal Rendille represent an amalgamation of *Rendille* and *Samburu* pastoralist populations. According to Elliot Fratkin (1998:64) "the *Ariaal* are the product of a long standing tradition of intermarriage between *Samburu* and *Rendille* society, and they have formed a unique bridge culture combining elements of the two larger traditions." These are the *Samburu* and the *Rendille*.

The *Samburu* are Nilotic cattle keepers from the Western Highlands of Kenya. During the 1890's, they were particularly hard hit by drought and famine (Waller and Sobania 1994:60). They along with the *Maasai* and *Turkana* (neighbouring pastoralist tribes) lost

their herds to rinderpest and pneumonia. The remaining destitute *Samburu* began migrating towards *Rendille* communities, offering their labour in exchange for cattle in an attempt to rebuild their stocks. These *Samburu* lived on the fringes of *Rendille* camps; Fratkin (1998:46) notes these people came to be called *Masagera* (*Rendille* who follow *Maasai*), *Turia* (mixture) or *Ariaal* (a word which may derive from the *Boran* word for mobile livestock camp).

The *Rendille* are Cushitic speaking camel keepers of the arid lowlands of Kenya. Whereas rinderpest and pneumonia had wiped out *Samburu* cattle herds, *Rendille* camel herders escaped unharmed and flourished during this period. However, by the end of the 19th century, *Rendille* populations were cut in half by smallpox. Although the camel herds remained intact, the *Rendille* lacked the human resources to properly care for them. The *Rendille* lack of manpower to herd their own camel stocks forced them into the position of having to hire *Samburu* and *Ariaal* to help maintain their herds. Through this alliance, the *Samburu* and *Ariaal* were once again able to build up their own cattle and small livestock herds, thereby lessening their dependence on the generosity of the *Rendille*.

The next serious threat to the pastoralists came in the form of British colonialists. However as Fratkin (1998:46) notes, the *Rendille*, *Samburu* and *Ariaal* managed to maintain good relations with the colonialists. In fact, the pastoralists welcomed the creation of administrative police posts in Marsabit as a means of protection against their enemies, the *Turkana* and *Boran*. For their part, the colonialists had little use for the arid deserts of the northern half of the country, except as a military buffer against Ethiopian encroachment.

Isolated Kenyan pastoralist groups enjoyed relative autonomy and anonymity from the decisions, policies, and politics centered in the Kenyan capital of Nairobi for well over a

hundred years. However, beginning shortly after Kenya's independence in 1963, capitalism, development, drought, and missionaries would bring change to the northern region.

2.3 Key Elements in Ariaal Society

2.3.1 Pastoralism

Barfield (1993:4) describes pastoralism as a mode of subsistence production based on livestock husbandry, requiring the frequent movement of herds for animal procurement of water and vegetation. In East Africa, pastoralism is a "food production system" in which "traditional" herding societies rely upon their livestock for milk, rather than for meat, or market sales (Fratkin 1991:6). According to Barfield (1993:4), "it is as much a way of life as a way of making a living," for in its "traditional" form, pastoralism conjoins family members and solidifies the household as the basic unit of production, hence bonding humans to animals, to each other and to the land.

2.3.2 Gerontocracy

In his 1969 ethnography, *The Samburu: A Study of Gerontocracy in a Nomadic Tribe*, Paul Spencer characterises *Samburu* culture as a gerontocracy. In a gerontocracy, elders in the community have control over all critical resources such as livestock and women. While it is hardly surprising in a patriarchal society to see men having a greater influence over women; in a gerontocracy, elder men also have considerable control over the social and economic lives of the young warriors or *lmurran* in the community. Thus not only do elders make all decisions centred on the care, feeding and distribution of livestock but elders are

also responsible for determining the timing of initiation ceremonies, negotiating bride-price payments and handling disputes within the community.

Among the Ariaal, elders perform all the blessings and ceremonial slaughters necessary for the coherence both of the individual family and the community. The *Ariaal* follow both *Rendille* and *Samburu* cultural practices but are more like *Samburu* in their community organization. That is, they are incorporated into *Samburu* clans, follow *Samburu* age set rituals, use the *Samburu* language and participate in *mugit* ox slaughters (Fratkin 1998:50). Those *Ariaal* who keep camels share with the *Rendille* rituals related to the well-being of their camels such as the *sorio* and *almondo* (Fratkin 1998:54). Whether the traditions followed are *Samburu* or *Rendille*, it is the elders in the community who oversee the performance of all rites and ceremonies associated with these traditions. As with the *Rendille*, the *Ariaal* have an elder who sits in the *naabo* or ritual center of the village reciting the evening prayers.

Decisions regarding marriage are negotiated entirely among the elders in the community for as Spencer (1973: 101) notes " the *lmurran* are generally felt to be too inexperienced to handle such matters." A *lmurran* has to be very careful not to anger any elder in the community for when his father begins negotiations for a bride, "every elder of her father's age-set or phratry, of her mother's phratry or any elder linked through some form of brotherhood to her family can refuse her in marriage by threatening to curse her future children (Spencer 1973: 101). Because this is a polygamous society, *lmurran* have the added problem of having to compete with elders for brides. "Regardless of the ideal for any girl to be a man's first wife, her kinsmen may be more attracted to the prospect of her becoming a junior wife to a known rich and worthy man than a first wife to an unknown and

possible unworthy *lmurran*" (Spencer 1973:101). Indeed for many families there is no choice. Thus many *lmurran* despite having completed the tenure for the warrior age-grade are forced by circumstances to remain single, and so are betwixt and between – no longer warriors but being unmarried -- unable to participate in the community as elders.

Among the *Ariaal* elders make important decisions concerning livestock and marriage as well as ensuring rituals and traditions necessary to the cohesiveness of the social unit are enforced and enacted. As with their active influence over all traditional and ceremonial aspects of the *Ariaal* way of life, one could expect that the elders in the community would have considerable influence over access to the educational system. For as Caldwell (1980:244) notes, "fundamentally, the school attacks the traditional family's economic structure by weakening the authority of the old over the young (and of the male over the female)."

2.3.3 The Ariaal Age Set System

An age set system is a series of rules marking the timing of different stages in the male life cycle (Roth 1998: lecture materials). Circumcision signifying the transition from boyhood to warriorhood opens the *Ariaal* age-set system. Among the *Ariaal* a new age-set is begun every fourteen years, here boys between the ages of eleven and twenty-five are circumcised with other members of their clan. Age-set systems consist of age-grades. An age-grade is a stage through which each male passes at some period of his life (unless he dies first) together with the others in his age-set. Thus each man belongs to only one named age-set but will pass through several different age-grades. There are three principal age grades among men. These are boyhood, before they are members of an age-set (from birth to adolescence), moranhood or warriors (from adolescence to early manhood) and elderhood

(from early manhood until death) (Fratkin 1998: 57-58). Below is the age-set distribution for the *Ariaal* (Fratkin 1998:45).

Figure 4 - Age Set Distribution for the Ariaal.

Age Set Name	Circumcision Year	Marriage Year
Il- Kororo	1978	1992
Il-Kashili	1964	1978
Il-Kimaniki	1951	1966
Il-Mekuri	1937	1951
Il-Kiliako	1922	1936

According to Fratkin (1998:57):

> For *Ariaal* men, circumcision and initiation into warriorhood is the most important event of their life. The circumcision ritual is performed in especially constructed villages outside the larger clan settlement, where the mother of each initiate builds her house for the two months of the circumcision villages' existence. The circumcision operation is performed by a man from the *Dorrobo* tribe who moves from boy to boy outside their mother's houses in the circle. Two male relatives hold the youth's back and right leg while the operation is performed. An initiate should not flinch or shout out during the operation, or he will be shamed for life. The boys rest in the circumcision village for about a month, until they have healed.

Each age-grade has explicit rules about what clothes and ornaments they wear, what foods they eat, or with whom they may associate. For instance, adolescent boys and married elders may milk camels, but warriors may not; warriors may wear red, and grow their hair, but boys may not (Fratkin 1998:57).

2.3.4 Women in Ariaal Culture

Ariaal women and girls have no formal group ceremonies, age-grades, and age-set rituals to mark the stages of their lives. They do however, pass through distinct periods as

preadolescents, adolescents, married women, mothers and widows (Fratkin 1998:58). Each of these roles has clear prescribed behaviours as well as prohibitions and restrictions. *Ariaal* women do not inherit livestock, either from their fathers, or from their husbands. Her husband may allot her several livestock for domestic use but she does not own them and cannot trade or sell them without permission from her husband.

An *Ariaal* widow is forbidden to remarry although she may continue to bear the children of her husband's kin (Fratkin 1998:61). The combination of widowhood and non-female inheritance places women in a precarious situation. For a widow, unable to remarry, lacks a husband to protect and provide for her and is dependent upon the generosity of her husband's kin. If they do not wish to support her she may become destitute. There is however, a way for an *Ariaal* widow to ensure her interests in her husband's stock. *Ariaal* girls typically marry men who are one or two age sets removed from them. This means that *Ariaal* girls marry older men, sometimes men as much as twice their age. Consequently, there are a great many *Ariaal* widows. The most prudent course of action for an *Ariaal* women, upon her marriage, is to produce a male heir. For although an *Ariaal* widow does not own the animals of her deceased husband, she can manage them in trust for her male children until they have passed through the warrior age grade. Once her sons have passed to the elder age grade, married and taken control over the herds, an *Ariaal* widow can feel confident that her own future is secure (Roth 1999: 9).

Among the *Rendille*, the production of a male heir is a celebrated event. "As soon as a wife has borne a male heir, she moulds her hair with fat and ochre into a large cockscomb, which is sometimes perforated, sometimes solid, and runs from the forehead to the neck,

where it ends in a little stump. This the woman keeps in perfect condition until her son is circumcised or her husband dies, when she removes it" (Adamson 1967:149-150).

Ariaal post-marital residence rule is patrilocal (Roth 1999:14). This means that upon her marriage an *Ariaal* girl moves to her husband's village. Children of the union belong to the husband's patriline as the *Ariaal* are patrilineal, that is, they trace descent though the male line (Roth 1999: unpublished article, pg. 14). *Ariaal* men pay a brideprice, traditionally eight cattle, but now usually one cow and a mixture of small stock, for the women they wish to marry (Fratkin 1998:59). This brideprice compensates the bride's family for the loss of her labour as well as the labour of her future progeny. Divorce is prohibited among the *Ariaal* (Fratkin 1998:62). Divorce would entail a women's family having to return the brideprice; something the receiving family might not have the option of doing if the receiving family has already used this brideprice to purchase a bride for their son.

In pastoral livestock economies, the entire family is the main unit of production. Even children are expected to help as much as they are able. *Ariaal* girls begin to work, assisting their mothers, very early in their lives. They are expected to help in the performance of the daily household routines and chores (Fratkin & Smith 1994:91). The main tasks of females in *Ariaal* society include: preparing meals; building and repairing houses; looking after younger children; manufacturing clothing and other implements; fetching water and fetching firewood. To a lesser degree, women and girls also tend to the herds, including grazing, watering, and milking livestock kept within the family compound. Women are also the primary sellers of milk from their herds (Fratkin & Smith 1994:101). According to Fratkin and Smith (1994:101), who did time allocation studies between October and December of 1985, *Ariaal* women spent, on average, 36.7% of their time engaged in various

household activities, 14% in livestock tasks, 14% in manufacturing tasks and 35% of their time resting.

Men spent their time tending to their herds, allocating livestock chores to various family members, supervising animal husbandry, maintaining wells, gossiping, and, provided they have the necessary skills, engaged in wage labour. Those same time allocation studies saw married males engaged in household tasks 7.2% of the time; 33.4% of men's time was spent in livestock duties, 2.3% in manufacturing tasks and 53.4% of their time was taken up by resting.

It is the circumcised warriors or *lmurran* who spend all of their time with the livestock taking the animals to grazing lands and bringing them back to the settlement. While away from the main settlement *lmurran* live in camps known as *fora.* Younger boys between the ages of six and eleven are usually responsible for the juvenile herd members grazing near the settlement (Fratkin 1998:83).

It is clear that all family members make important contributions to the functioning of the domestic unit. Women's work, in particular involves meeting the daily needs of family members for food, water, shelter and clothing. Sending any child to school means his/her labour would be lost to the family, placing an additional burden on the remaining members to complete the chores. Thus amongst the *Ariaal*, sending girls to school increases the domestic burden on mothers and sisters. Female education is further hindered by the cultural practises of patrilineality and patrilocality. Both these practices remove the daughter and any children she might bear from her natal home, thus parents never see a future return from investing in their daughter's education in the present. In a patrilineal system descent is traced through the male line. When a girl marries, the children of the union, their labour and her labour belong

to the husband's lineage. In places where the marriage residence rule is patrilocal; when a girl marries she leaves the natal home, and moves in or near her husband's father's home. Clearly, parental investment in a daughter's education has little guarantee of returns for the natal family.

2.3.5 Nykeri Tradition

Nykeri are adolescent beaded girls, sometimes as young as ten to twelve years old, who enter into long term pre-marital sexual relationships with *lmurran* or warriors (Roth *et al.* 2001: 8). To initiate these relations, warriors present beads to a young girl's mother. The girl's mother then gives her consent to the relationship, by fashioning the beads into necklaces, bracelets, or skirts and giving them to her daughter to wear. A *nykeri* may have several partners before she marries since *lmurran* often share their *nykeri* amongst themselves. *Lmurran* rarely marry the *nykeri* they have beaded. In fact, marriage among *nykeri* and *lmurran* would be considered incestuous since most *nykeri* come from the same clan as the warriors with whom they are involved (Roth *et al.* 2001:8). The marriage rule for the *Ariaal* is clan exogamy, thus *Ariaal* are expected to marry someone from outside his or her own clan.

In *Ariaal* society the *nykeri* tradition functions as one of the ways in which intergenerational tension and conflict are avoided (Roth *et al.* 2001:8). The warriors' age grade consisting of adolescent males between the ages of eleven and twenty-five are bound by the rules of that age grade for the next eleven years of their lives. As such they will spend most of their time away in *fora* camps responsible for the care and maintenance of large numbers of livestock. Warriors will be completely under the control of elders who will make all major decisions concerning the livestock, as well as concerning the timing of

ceremonies and rituals of the age grade. During this time warriors will be prohibited from marrying. Warriors will perform most of the dangerous, physical labour necessary for the survival of their family's herds. As they do so, they will witness their fathers and other elder prosperous males in their community marry increasingly younger wives (sometimes their own *nykeri*), continue to make all the important decisions concerning the herds and gain in status and prestige in the community. The *Ariaal* community recognises that these young males need an outlet for their tensions and frustrations and the *nykeri* tradition provides that release.

Roth et al., (2001) found that educated girls were able to opt out of the system. This was mainly due to parental influence, since parents who invested in their daughter's education rarely agreed to allow them to participate in the *nykeri* tradition. Thus these girls were not beaded. In fact, Roth et al., (2001) found a negative correlation between female education and beading. They also found that girls who opted out of the *nykeri* tradition had a later sexual debut, thus reducing the risk of contracting the HIV virus and other STD's as well as reducing their overall fecundity.

It seems quite clear that women's roles are prescribed and narrowly defined in *Ariaal* culture. Beginning at a very young age girls work extensively in the home helping with domestic chores. To send a female child to school reduces the household labour pool. Later, young adolescent girls as *nykeri* serve as sexual partners to the warriors in a bid to help alleviate intergenerational tension. Without some sort of outlet this tension has the potential to seriously disrupt *Ariaal* society. As Roth et al., (2001) have demonstrated girls who attend school are frequently removed from the *nykeri* tradition by their parents. Reducing the number of *nykeri* through schooling has many positive benefits especially with regards to

reducing the transmission of HIV and other STD's. However, the loss of the *nykeri* tradition threatens the cohesiveness of the society. Finally, married *Ariaal* women who are without the benefit of inheritance or the option of remarriage must concentrate their efforts on producing a male heir to secure their retirement. In the event that a female child is produced an *Ariaal* woman understands that this female child will eventually leave the natal home. There appears to be very little room to manoeuvre within this system, since the roles women are assigned are important to the social cohesiveness of the group. It is evident through the work of Dr. Roth et al., (2001) that sending girls to school disrupts this cohesion.

2.3.6 Inheritance Patterns Among the Ariaal

Tension is also alleviated through the knowledge warriors have that they will eventually inherit the herds for which they are caring. *Ariaal* practice partible inheritance, with livestock divided among all sons, in contrast to the *Rendille* inheritance strategy of primogeniture (Roth 1991). In *Ariaal* communities all sons can expect to receive a portion of their father's livestock, whereas only first born *Rendille* sons will inherit from their fathers. In his research among the *Rendille* conducted in September and October of 1987, Roth (1991:139) demonstrated first born sons were chosen for schooling significantly less than later born sons, reflecting the importance of primogeniture.

From the preceding discussion of *Ariaal Rendille* cultural traits one can gain an insight into the key elements of *Ariaal Rendille* society which would have the greatest impact on parental decision making in determining which children will be selected to go to school. This thesis argues that in *Ariaal Rendille* society the primary determinants influencing parental decision-making are situated within the context of cultural traditions. It is the

amalgamation of these cultural traditions, that is, inheritance patterns, age-set membership, patrilineality, ascribed gender roles and subsistence patterns which are the primary determinants of parental selection in terms of which children get to attend school; not random selection, aptitude or a "lucky dip" as Caldwell, characterises the selection process.

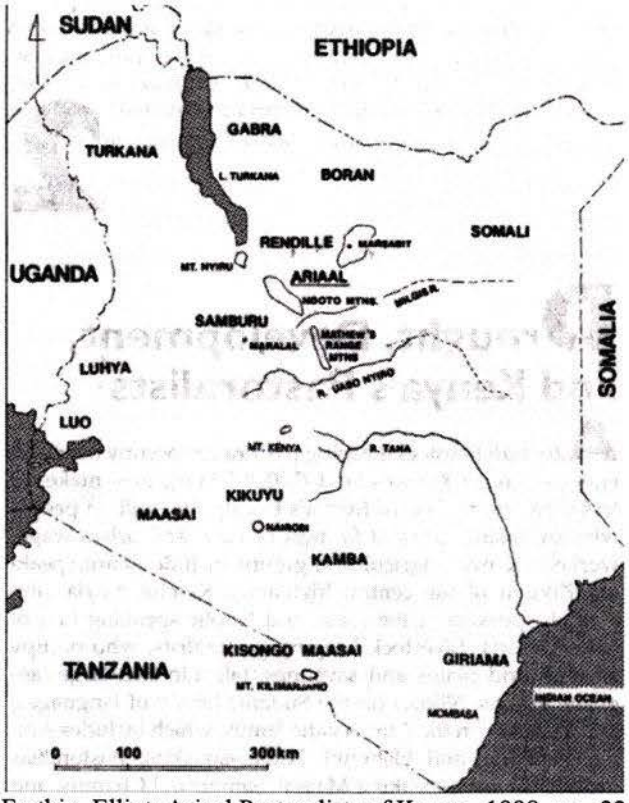
CHAPTER THREE

MATERIALS AND METHODS

MATERIALS

3.1 The Setting: Karare Village

Figure 5 Tribes Of Kenya And Their Geographical Locations



Fratkin, Elliot: Ariaal Pastoralists of Kenya., 1998, pg., 22

Figure 5 shows the location of the various tribes in Kenya. The *Ariaal-Rendille* live in the Marsabit area in the northern regions of Kenya. In 1985, University of Victoria Masters thesis candidate, Judith Mitchell visited Kenya to conduct research for her thesis on Women's Milk Marketing. Not having had the good fortune to visit the community myself, I give you Ms. Mitchell's description of the community taken from her thesis entitled Pastoral

Women And Sedentism : Milk Marketing By *Ariaal Rendille* Females Of Northern Kenya, 1997.:

> The *Ariaal Rendille* community of Karare (population 2,000) is situated in north-central Kenya on the lower western slope of Mount Marsabit, 17 km downhill from the district's capital of Marsabit. The Karare community consists of traditional *manyattas* (clan-based settlements) scattered within a 10 km radius from the Karare centre. Recent drought, intertribal warfare, and loss of grazing land to a nearby national game preserve has restricted the mobility of community members, causing considerable reduction in livestock holdings of many. A proportion of the *manyattas* consist of sedentary agro-pastoral *Ariaal* while the rest are composed of either sedentary or semi-sedentary cattle pastoralists, who often graze their animals inside the forested state preserve. Just as Fratkin (1991:24) notes "there is no 'typical' *Ariaal* community", I also observe that there is no 'typical' *Ariaal manyatta* within the community of Karare as a whole.
>
> The Karare centre consists of a very small *soko* (two market stalls), several tiny shops, and a cluster of residential dwellings belonging to *Ariaal*. These are located just roadside to the only transportation route in the north, which links Marsabit, and the area to Isiolo and Nairobi. With the exception of lorry and truck transport movement to and from the south, the rugged corrugated road and paucity of locally owned vehicles keeps traffic at a minimum. Lying within a ten minute walk from the Karare centre is the Kargi-Karare Catholic Mission which supplies the community with a priest and church, elementary school, medical dispensary and a piped water well. At times the relations between the mission and the *Ariaal* appear troubled, as regular access to education, medical services and/or water supplies is often dependent upon the personal 'likes and dislikes' of the local priest. An alternative source of piped water for the community exists in the agro-pastoral settlement known as the Scheme. This watering point was established in the 1970s by the National Council of Churches of Kenya as part of a famine-relief project for irrigated maize farming (Loltome, per. comm.; Fratkin 1993).

Professional photographer Sabania Schwartz, who collected private donations and held other fund-raising ventures to raise the money, founded the school in the 1980's. The school has since become a maintained school, meaning the Kenyan government provides

trained teachers (Roth: personal communication). Preliminary data analysis shows that of the 1,071 children in this study 300 or 28% of them have ever attended school, whereas 765 or 72% of children in this study have never attended school. Schwartz's husband Dr. H.J. Schwartz was part of UNESCO's Man and the Biosphere Project, which funded the Integrated Project in Arid Lands (IPAL). The IPAL project was an interdisciplinary project which "studied the impact of domestic livestock on desert environments in northern Kenya" (Fratkin, Roth and Galvin 1994:2).

3.2 Subsistence Strategies within Karare

Fratkin and Smith (1994:91) point out that pastoral societies have wide variations in production. Some specialize exclusively in livestock, while others maintain mixed economies in agriculture and animal husbandry or small stock pastoralism and fishing. With few exceptions, most pastoralist societies produce primarily for their own subsistence needs. That is; they use the milk, meat, and blood of the animals to meet their nutritional requirements. In addition they use livestock for trade and rituals. Among the *Ariaal* "a main economic role of cattle is for bridewealth....cattle are also the main source of cash income providing over half of their cash earnings through trade and sales; small stock account for an additional 40% of generated income" (Fratkin and Smith 1994:99). *Ariaal* will sell their livestock to market traders for cash in order to purchase other foods items such as grains, tea and sugar or make direct trades of livestock for foodstuffs with neighbouring agricultural groups (Fratkin & Smith 1994:93). Among this study population of eighteen villages, 89 families practice a combination of herding and agriculture, and 167 families can be classified as primarily subsisting off the products of their herds.

Of the eighteen villages in this research study, the families in three are comprised of *Ariaal* whose main mode of subsistence is primarily through the products of agriculture. Neither the *Rendille* nor *Samburu*, the "parent" tribes of the *Ariaal*, have traditions of agricultural production. Among the *Ariaal*, the transformation from pastoralist to agriculturist was the response to long periods of drought occurring between 1963 and 1980 (O'Leary 1990:161). The Kenyan Government was convinced that sedentarization and commercial livestock production were the keys to combating the effects of drought as well as ensuring the survival of the pastoralist populations, albeit, not as nomadic pastoralists. As a result, in Kenya, during the drought years between 1963 and 1980 "the District Famine Relief Committee did not restrict itself to feeding the destitute. It also recommended long-term solutions to the drought and numerous recommendations were discussed. These included: the establishment of agricultural settlement schemes on Mt. Marsabit...government policy favoured settlement schemes, including irrigation projects. It was less disposed to taking measures to strengthen the livestock economy which is the mainstay of the districts economy" (O'Leary 1990:163).

3.3 Data Collection

This research will utilize information gathered by Dr. Eric Roth, Professor of Anthropology at the University of Victoria, during his visit to Kenya in June and July of 1996. These data were collected as part of a larger research project entitled *Concomitants of Sedentism and Female Milk Marketing for Ariaal Rendille Pastoralists of Northern Kenya.* This ongoing parent project, funded by the Social Sciences and Humanities Research Council of Canada (SSHRC), lies under the direction of my graduate supervisor, Dr. Eric A. Roth.

The parent project examines, over a three-year period, the social and biological concomitants of sedentary female milk marketing in the formerly nomadic *Ariaal Rendille* community of Karare and assesses whether female milk marketing benefits the health, growth and nutrition of *Ariaal Rendille* children. The SSHRC study also operates in collaboration with a National Science Foundation (NSF) funded project, entitled *Social Demographic and Health Consequences of Pastoral Sedentarization in Marsabit District, Kenya*. The principal investigator of the NSF project is Dr. Elliot Fratkin, Department of Anthropology, Smith College, Northampton, Massachusetts, USA. Co-investigators are Dr. Eric A. Roth, Dr. John Galaty, McGill University and Dr. Martha Nathan, Smith College.

A team of enumerators collected information from participants on a number of demographic indicators including: marital status, number of children, parental education level, parental age-set affiliation, languages spoken, whether children ever attended school, type and number of livestock holdings, sources of monetary income, and whether families sold milk or agricultural products.

Data were collected from two hundred and fifty-six (256) participating households scattered throughout eighteen villages in and around the town of Karare. In total one thousand and seventy-one (1,071) children were included in the study. Below is a detailed breakdown providing the names of the villages surveyed for this study, the number of participating households in each village and the subsistence pattern associated with each village.

Figure 6 - Karare Village and Houses

Karare Villages

Number used for coding purposes	Name of Village	Number of Households in	Subsistence Pattern

		Village	
1	Lkartinya 1	10	Pastoralists
2	Lkartinya 2	4	Pastoralists
3	Lbaranja	20	Pastoralists
4	Kulapesa	36	Pastoralists
5	Lkume 1	6	Pastoralists
6	Lkume 2	23	Pastoralists
7	Lorora	17	Pastoralists
8	Lmaromo 1	10	Pastoralists
9	Lmaromo 2	2	Pastoralists
10	Lmusakado 1	1	Pastoralists
11	Lmusakado 2	7	Pastoralists
12	Lmusakado 3	5	Pastoralists
13	Lmararie 1	8	Pastoralists
14	Lmararie 2	12	Pastoralists
15	Lmararie 3	6	Pastoralists
16	Scheme - Left Side	42	Agro-pastoralists
17	Scheme - Right Side	15	Agro-pastoralists
18	Scheme - Center	32	Agro-pastoralists

3.4 Predictions of Which Children Attend School based on Cultural Patterns

Based on *Ariaal* cultural patterns outlined in Chapter Two, the following predictions can be made regarding which children will be selected to attend school.

Prediction One: Female Bias

As with most sub-Saharan African pastoralist populations brideprice is paid for women. In essence a father trades his daughter for cattle and small stock. Thus, a male seeking a wife will have to pay for her with cattle. Once a girl marries, her natal family loses access to her labour and the labour of any children she might bear. In turn the natal family gains livestock that still require a great deal of care, yet the labor pool is now reduced.

There is no indication that an educated woman fetches a higher bride price than an uneducated woman does. Indeed, an educated woman may find it more difficult to find a partner, especially, in light of the fact that educated women enjoy /demand greater autonomy. Patriarchy and female liberation hardly go hand-in-hand! One can predict that females in any given family will be given lower priority than males as to attendance at school.

Predication Two: Have Siblings Ever Attended School?

Once a parent has made the initial decision to participate in the educational process, then that parent has undergone an attitudinal shift and has accepted the idea that schooling is an instrument of social betterment. It is therefore likely that if siblings attend school, then all the children in a particular family will attend school.

Predication Three: Birth Order

The *Ariaal* practise partible inheritance, which means that all the males in any given family, theoretically, receive a share of their father's possessions. However, there is much uncertainty in the *Ariaal* way of life: animal stocks can be decimated by disease or drought. First born sons who will be the first to pass though the age-grade cycle will be less likely to go to school, since parents can be relatively confident that there will be stock to inherit. Later born sons face more uncertainty and thus would be selected to attend school as a means of "hedging their bets."

Female children do not inherit. First born female children will be expected to be available for marriage to the members of the up-and-coming age-set age, who will all be

seeking brides upon completion of the cycle. For this reason, it is predicted that later born female children will be sent to school preferentially over first-born female children.

Predication Four: Father's Age Set Affiliation

As mentioned, the town of Karare, established during the early 1970's, is a relatively new settlement. Prior to its existence the current inhabitants participated in a predominantly pastoral existence, living in semi-permanent camps and moving with their livestock. Elder people in this community have stronger ties with this tradition than the younger generation. The performance and maintenance of tradition requires a particular value system. Despite current social change, older age-set parents still retain the values encapsulated in these traditions, and are thus less supportive of education services. It is predicted that younger parents, who have grown up in the town, and have only a dim memory of a previous mode of existence, will be more amenable to sending their children to school.

Predication Five: Wife Order

In *Ariaal* culture there is a certain status associated with being the first wife. Second and subsequent wives, who are usually considerably younger, often defer to the wishes and demands of the elder first wife. It is predicated that the children of first wives will be selected over the children of second and subsequent wives, to attend school.

Prediction Six: Subsistence Pattern

It is predicted that the two types of subsistence patterns, that is pastoralism and agro-pastoralism, found among the families in Karare, will have an impact on schooling choices.

One can predict agro-pastoralists are more likely to send their children to school, as they are more tied to the "modern" monetary economy, and thus have seen a shift in their traditions and values. Agro-pastoralists do not have the huge labour requirements associated with herding livestock but rather have short periods of intense agricultural activity, leaving them free to pursue other activities while crops are growing. Pastoralists, on the other hand, have daily requirements for the feeding, watering and care of herd animal stocks. Pastoralists are also concerned with building up their stocks either through careful animal husbandry or sometimes raids on neighbouring tribes. Pastoralists are thus more likely to keep their children at home, as these children constitute their families' labour pool.

Prediction Seven: Household Wealth

It is predicated that herders whose herd stocks are above the median of eleven (11) animals per household are more likely to send their children to school than herders whose herd stocks are below the sample median of eleven (11) animals. Those herders whose herd total is above the sample median have the potential financial means to send their children to school. Those herders whose income falls below the sample median lack the resources to send children to school. Further to this, they need the labour of their children to continue to build up their herds.

The use of cash in *Ariaal* society is a recent phenomenon and as such has been used as a proxy to indicate a modern measure of wealth as opposed to the traditional way of measuring wealth by calculating livestock holdings. It is predicted that families whose income is above the sample median of 6,000 shillings are more likely to send their children to school than families whose sample median income is below 6,000 shillings.

3.5 Data Analysis

Analysis of the data collected during the 1996 field study will follow closely the model used by Dr. Eric Roth in 1991 to analyze parental decision making among the *Rendille* pastoralists of Korr in northern Kenya.

The dependent variable "ever been to school" forms a dichotomous categorical variable. A dichotomous variable can only have two outcomes. For instance 'ever been to school' can only be answered yes or no. In this instance the dependent variable "ever been to school" was coded (1) for yes and (2) for no. As no assumptions about the form of the parent distribution are required these responses are assumed to be distribution free.

This research is concerned with the relationship of one or more variables to the outcome variable 'ever been to school,' thus it is a multivariate problem. The mathematical modelling approach best suited to this problem analysis is logistic regression. Logistic regression is a most popular analytical model because it provides estimates that must lie in the range between zero and one, and a non-parametric S-shaped description of the combined effects of several factors on an outcome. Thus data will be analyzed and examined by logistic regression using the LOGISTIC and CATMOD routines included in Statistical Analysis System (SAS), version 6.11. (SAS 1996).

In this study the dichotomous variable "ever been to school" forms the dependent variable. Independent variables include: sex of child; birth order; whether siblings attend school; parental age set position; wife order; subsistence pattern; household wealth total shillings and household wealth cattle holdings.

Coding for the independent variables was organized as follows:

Figure 7 - Coding of Variables

	Independent Variable	Abbreviations used in Tables	Coded One (1)	Coded Two (2)
1.	Sex of Child	SEX	Female	male
2.	Siblings Ever Attend School	SIBS	Yes	no
3.	Birth Order	BIRTH	first born	subsequent children
4.	Father's Age Set Affiliation	AGESET	1, 2, 3,	4, 5
5.	Wife Order	WIFE	first wife	all other wives
6.	Subsistence pattern	SUBPAT	pastoralism	agro-pastoralism
7.	Household Wealth - Cattle Holdings - Traditional	WEALTHCT	below median	above median
8.	Household Wealth - Total Shillings - Modern	WEALTHTS	below median	above median

Sex of child was coded (1) for female and (2) for male. Whether siblings ever attended school was coded (1) for yes and (2) for no. Birth order was coded (1) for the first-born child and (2) for all subsequent children. Father's age set affiliation was determined to be (1) if the father belonged to age sets Il-Kororo, marriage year 1992; Il-Kishili, marriage year 1978; or Il-Kimaniki, marriage year 1965; or (2) if the father belonged to age sets Il-Mekuri, marriage year 1951 and Il-Kiliako, marriage year 1936. Wife order coded children of the first wife as (1) and children of second and any subsequent wives as (2). Subsistence pattern was coded (1) for pure pastoralism and (2) for agro-pastoralists.

Household wealth was determined by two criteria. Firstly, as a measure of modern wealth the total past year sales of wet milk, dry milk, cattle and small animal stocks was calculated using PROC UNIVARIATE to establish a median of 6000 shillings. Using the routine PROC UNIVARIATE procedure the total number of cattle was calculated, to represent traditional measures of wealth. The median was calculated to be eleven (11) livestock units. Families with household income or total livestock units above the median

were coded as (2). Families with household income or total livestock units below the median were coded as (1).

As was indicated earlier in this chapter Karare is home to three relocated villages of *Ariaal* who now subsist predominantly through agricultural activities. Collectively this group is referred to as the "Scheme" (Roth: personal communication). Further to the prediction that agro-pastoralists would be more likely to send their children to school than would pure pastoralists, this research is also interested in whether there is a difference in attendance based on sex between the agro-pastoralists and pure pastoralists. In order to test for sex differentials the bivariate PROC FREQ and the multivariate PROC CATMOD and PROC LOGISTIC models runs will be run separately for each sex and each subsistence pattern. Isolating the pure pastoralists from the agro-pastoralists will form these samples. The initial census and subsequent coding process, coded pure pastoralists villages as numbers 1 through 15, agro-pastoralists villages were coded as numbers 16 through 18. This can be seen in Figure Six above. Villages 1 through 15 (pure pastoralists) have a sample size of n= 673 children, while villages 16 through 18 (agro-pastoralists) have a sample size of n=392 children.

In summary, the demographic data collected from among the *Ariaal* of Karare have been coded and formulated into dichotomous variables. These variables include the dependent variable "ever been to school" as well as eight independent variables – sex of child, siblings ever been to school, birth order, age-set affiliation, subsistence pattern, wife order, household wealth in total shillings and household wealth in total cattle holdings. In addition, and based on the key determinants in *Ariaal* society, as discussed in Chapter Two, a number of predictions have been put forth concerning which children will be selected to

attend school. For instance it is predicted that males will be selected over females, later born children will be selected over first born children and when one child in a family attends school all children will be likely to attend as well. Children of the first wife will be selected to attend school and children whose fathers belong to the younger age sets will also be selected to attend school. *Ariaal* characterized as agro-pastoralists will be more likely to send their children to school than pure pastoralists and finally those families whose household wealth, either in total shillings or total cattle sales, is above the median are also more likely to send their children to school. In addition, agro-pastoralist and pure pastoralists populations will be analysed to determine if there are sex differentials in school attendance.

The SAS PROC LOGISTIC and PROC CATMOD logistic regression procedures will be used to test the effect of the independent variables on the dependent variable. Chapter Four will present and discuss the results of the logistic regression. In addition, the results will be discussed in light of the predicted behaviours to determine if parental schooling choices can indeed be ascertained from cultural patterns and traditions.

CHAPTER FOUR

ANALYSIS AND RESULTS

4.1 General Results

The data were first subjected to bivariate analysis, which shows the impact of each independent variable on the dependent variable. These results were derived from the SAS PROC FREQ module, and are shown in **Appendix A** as chi-squared values. This is a less interesting analysis, as it does not provide information regarding how the independent variables act together on the dependent variable. Nevertheless, it does allow for some preliminary observations. For all children, results indicate that the variables birth order, sex of child, whether siblings attended school, father's age set, subsistence pattern, household wealth as measured by cattle holdings, and wife number all have a statistically significant ($p<0.05$) impact on whether a child will be sent to school. Except for wife number which presented a chi-square value of 0.004, and household wealth as measured by cattle holdings which presented a chi-square value of 0.009 each of the above independent variables presented a chi-square value of greater than 0.001. Household wealth as measured by total shillings presented a chi-square value of 0.129 and thus does not appear to have an impact.

To test for sex-specific patterns the total data set was divided into males (n. = 543 and females n. =522). Sex of child was not collected for six of the children in the study sample. Results of the bivariate analysis derived from the SAS PROC FREQ model for females indicate that birth order (chi-square 0.005), whether siblings attended school (chi-square 0.001), father's age-set (chi-square 0.001), wife number (chi-square 0.005), cattle holdings (chi-square 0.001) and subsistence pattern (chi-square 0.001) all have a statistically significant ($p<0.05$) impact on whether a female child will be sent to school. Household

wealth as measured by total shillings resulted in a chi-square value of 0.057 and is thus a non-significant variable.

Results of the bivariate PROC FREQ for males indicate that the independent variables birth order (chi-square 0.001), whether siblings attended school (chi-square 0.003) subsistence pattern (chi-square 0.001) and fathers' age-set (chi-square 0.037) have a statistically significant ($p<0.05$) impact on whether a male child will be sent to school.). Wife number (chi-square 0.109) and both measures of household wealth, that is cattle holdings (chi-square 0.469) and total shillings (chi-square 0.403) are non-significant variables for males.

While these bivariate results give some indications of which variables are significant and which are not, they do not provide information about the interaction between the independent variables and how they act concomitantly on the dependent variable. For this a multivariate model is needed and the data were subjected to two such tests – the SAS PROC LOGISTIC regression with a backward elimination procedure and the PROC CATMOD procedure.

PROC LOGISTIC is designed primarily for logistic regression analysis when the outcome variables are categorical. It provides useful information such as odds ratio estimates and model diagnostics as well as providing the most parsimonious fit of the data, which it does by employing stepwise procedures which eliminate all variables exceeding the 0.05 significance level (Stokes et al. 1996:165). The PROC LOGISTIC model is a main effects model providing information on the impact of an independent variable on the dependent variable while simultaneously controlling for the effects of other independent variables (Singleton 1988: 212). In short, it does only one thing at a time.

The PROC LOGISTIC procedure presents clear, useful, results in the form of an odds ratio. The odds of an event is defined as the probability of the outcome event occurring divided by the probability of the event not occurring. The odds ratio for a predictor tells the relative amount by which the odds of the outcome increase (O.R. greater than 1.0) or decrease (O.R. less than 1.0) when the value of the predictor value is increased by 1.0 units. Also found in the PROC LOGISTIC procedure outcome is Pr > chi-square which is the probability of obtaining a greater chi-square statistic (by chance) than that observed, provided that the null hypothesis (that the parameters for the effect are zero) is true. Finally, the procedure generates the WALD statistic, a test of the null hypothesis that the parameters for the effects are zero. This has an asymptotic chi-square distribution. WALD is a general command for analyzing nonlinear functions of parameters.

While PROC CATMOD can also be used as a main effects model, for this analysis a saturated PROC CATMOD procedure was performed as it permits an examination of interaction between variables e.g. sex - by birth order. "Interaction effects refer to outcomes in which the effect of one independent variable depends on the level or value of another" (Singleton et al. 1988: 229). PROC CATMOD is an alternative way in which to fit the logistic regression model for some analysis. The main advantage is that it is not necessary to create indicator variables to handle qualitative explanatory variables. PROC CATMOD is a deviation from the mean model; its effects are differential rather than incremental (Stokes et al. 1996:206).

The PROC LOGISTIC procedure features several selection methods, for this analysis the BACKWARD parameter was selected. In this model, "results of the Wald test for individual parameters are examined and the least significant effect that does not meet the

level for staying in the model is removed. Once an effect is removed from the model, it remains excluded. The process is repeated until no other effect in the model meets the specified level for removal" (Stokes et al., 1995). These remaining variables, after eliminating all variables exceeding the 0.05 significance level, were subjected to the saturated PROC CATMOD procedure in order to examine interactions among the statistically significant variables.

To begin, I ran a main effects model incorporating all children. The most parsimonious model, derived by backward elimination procedures, is shown in **Table 1**. The PROC LOGISTIC results in **Table 1** show that the familial variables of birth order, sex of child, and whether siblings ever attended school have a significant impact on whether a child is selected to attend school. Thus the composition of the household is of great importance. In addition, the variable subsistence pattern also proved significant. The independent variables wife number, household wealth, whether total shillings or cattle holdings and father's age-set does not have an impact on child selection.

Table 1
PROC LOGISTIC (main effects) with backward elimination for ALL CHILDREN

PROC LOGISTIC - Analysis of Maximum Likelihood Estimates for All Children

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr> Chi-Square	Standardized Estimate	Odds Ratio
Intercept	1	-0.6858	0.5057	1.8392	0.1750	.	
Birth	1	-0.8173	0.1621	25.4188	0.0001	-0.192898	0.442
Sibs	1	-0.7134	0.1636	19.0231	0.0001	-0.189874	0.490
Sex		0.5390	0.1455	13.7178	0.0002	0.148628	1.714
Sub Pattern	1	0.9066	0.1467	38.2093	0.0001	0.241167	2.476

Results of the saturated PROC CATMOD for all children, shown in **Table 2,** found that there are two interactions, the first between subpat and sibs and the second between

subpat and sex. This indicates that subpat will have a measurable effect on these two variables. In effect, there is an independent relationship between subpat, sibs and sex above and beyond their relationship to the dependent variable. Thus the model indicates that sibs, sex, subpat and birth appear to have strong effects on the variable 'ever been to school' and these would be better assessed in a model that includes the interaction of sibs/subpat and sex/subpat.

Table 2
PROC CATMOD (saturated model) for ALL CHILDREN

PROC CATMOD - Analysis Of Maximum-Likelihood Estimates For All Children

Effect	Parameter	Estimate	Standard Error	Chi-Square	Probability
Intercept	1	-0.9400	0.0981	91.73	0.0000
Birth	2	0.4088	0.0907	20.30	0.0000
Sibs	3	0.4960	0.0977	25.79	0.0000
Sex	4	-0.3067	0.0924	11.01	0.0009
Subpat	5	-0.3603	0.0955	14.24	0.0002
Birth*Sibs	6	0.0389	0.0897	0.19	0.6646
Birth*Sex	7	-0.0108	0.0876	0.02	0.9020
Birth*Subpat	8	-0.0260	0.0870	0.09	0.7653
Sibs*Sex	9	0.1228	0.0901	1.86	0.1731
Sibs*Subpat	10	-0.2720	0.0915	8.84	0.0029
Sex*Subpat	11	-0.1817	0.0837	4.71	0.0299
Birth*Sibs*Sex*Subpat	12	-0.0912	0.0813	1.26	0.2619

To ascertain if these patterns differ with respect to the sex of the offspring a main effects model for females only was run with PROC LOGISTIC. Results shown in **Table 3** indicate that birth order, whether siblings ever attended school, father's age set and subsistence pattern have an impact on whether a female child is selected to attend school. Wife number and household wealth, again both total shillings and cattle holdings do not have an impact on parental selection for female children.

Table 3
PROC LOGISTIC (main effects) with backward elimination for FEMALES ONLY

PROC LOGISTIC - Analysis of Maximum Likelihood Estimates for Females

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr> Chi-Square	Standardized Estimate	Odds Ratio
Intercept	1	0.2823	0.7696	0.1345	0.7138		
Birth	1	-0.8055	0.2655	9.2054	0.0024	-0.180683	0.447
Sibs	1	-0.9435	0.2976	10.0509	0.0015	-0.246498	0.389
Age-Set	1	-0.6705	0.2903	5.3359	0.0209	-0.168429	0.511
Sub Pattern	1	1.3458	0.2292	34.4687	0.0001	0.355683	3.841

Results of the saturated PROC CATMOD for females only are listed in **Table 4.** These indicate no interactions among the variables deemed significant by the PROC LOGISTIC procedure.

Table 4
PROC CATMOD (saturated model) for FEMALES ONLY

PROC CATMOD - Analysis Of Maximum-Likelihood Estimates For Females

Effect	Parameter	Estimate	Standard Error	Chi-Square	Probability
Intercept	1	-3.2682	102.8	0.00	0.9746
Birth	2	0.4821	0.1859	6.72	0.0095
Sibs	3	0.5167	0.1861	7.71	0.0055
Ageset	4	0.2284	0.1997	1.31	0.2527
Subpat	5	-0.6428	0.1831	12.32	0.0004
Birth*Sibs	6	-1.8714	102.8	0.00	0.9855
Birth*Ageset	7	1.8270	102.8	0.00	0.9858
Birth*Subpat	8	-1.8936	102.8	0.00	0.9853
Sibs* Ageset	9	2.0431	102.8	0.00	0.9842
Sibs*Subpat	10	-2.1661	102.8	0.00	0.9832
Ageset *Subpat	11	2.1726	102.8	0.00	0.9831
Birth*Sibs* Ageset *Subpat	12	1.9639	102.8	0.00	0.9848

The same tests were conducted for males only. Results of the main effects PROC LOGISTIC are shown in **Table 5.** These indicate that the variables birth order, whether siblings ever attended school and subsistence pattern exert the greatest influence on whether a male child will be selected to attend school. Wife number, father's age-set, household wealth, both total shillings and cattle holdings, do not have an impact on parental selection for male children.

Table 5
PROC LOGISTIC (main effects) with backward elimination for MALES ONLY

PROC LOGISTIC - Analysis of Maximum Likelihood Estimates for Males

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr> Chi-Square	Standardized Estimate	Odds Ratio
Intercept	1	0.4782	0.5931	0.6502	0.4201		
Birth	1	-0.7841	0.2073	14.3093	0.0002	-0.192667	0.457
Sibs	1	-0.5054	0.2050	6.0765	0.0137	-0.136498	0.603
SubPattern	1	0.6138	0.1948	9.9267	0.0016	0.164343	1.847

Results of the saturated PROC CATMOD for males only, as seen in **Table 6,** indicate that there was an interaction between the SIBS and SUBPAT variables. This interaction presented a probability of 0.0249. As was seen with ALL CHILDREN, the variable subsistence pattern is again influential on the siblings ever attend school variable in terms of parental schooling decisions.

Table 6
PROC CATMOD (saturated) for MALES ONLY

PROC CATMOD - Analysis Of Maximum-Likelihood Estimates For Males

Effect	Parameter	Estimate	Standard Error	Chi-Square	Probability
Intercept	1	-0.6331	0.1182	28.67	0.0000
Birth	2	0.4014	0.1182	11.53	0.0007
Sibs	3	0.3948	0.1182	11.15	0.0008
Subpat	4	-0.2134	0.1182	3.26	0.0711

Table 6 (continued)
PROC CATMOD (saturated) for MALES ONLY

PROC CATMOD - Analysis Of Maximum-Likelihood Estimates For Males

Effect	Parameter	Estimate	Standard Error	Chi-Square	Probability
Birth*Sibs	5	0.0923	0.1182	0.61	0.4352
Birth*Subpat	6	-0.0387	0.1182	0.11	0.7431
Sibs*Subpat	7	-0.2652	0.1182	5.03	0.0249
Birth*Sibs*Subpat	8	0.0387	0.1182	0.11	0.7434

The independent variable 'subsistence pattern,' whether for all children, females only, or males only, presented the most consistent statistically significant results ($p<0.05$) as indicated in the bivariate analysis results (see **Appendix A** Tables 14 - 16) as well as the PROC LOGISTIC results (see Tables 1, 3 and 5), thereby prompting further investigation of this variable. To that end, bivariate and multivariate runs were conducted separately for each subsistence pattern, that is agro-pastoralists and pure pastoralists in the context of the sex variable.

Bivariate results as shown in **Appendix A** Table 23 for agro-pastoralists indicate that roughly equal numbers of female children (n=74) attend school as do male children (n=89). Sex of child offers a chi-square value of 0.493, thus it is not a statistically significant variable for the agro-pastoralist population. This is confirmed by the PROC LOGISTIC run. PROC LOGISTIC results shown in **Table 7** indicate that birth order and whether siblings ever attended school are important variables among agro-pastoralists. The results of the PROC LOGISTIC with backward elimination, as shown in **Table 8** eliminated sex of child (as well as several other variables) with a Pr > Chi-square of 0.4625. Thus, it is clear that for the agro-pastoralist population sex of child is not a determining factor in the selection of which child (ren) will attend school.

Table 7
PROC LOGISTIC (main effects) with backward elimination for AGRO-PASTORALISTS

PROC LOGISTIC - Analysis of Maximum Likelihood Estimates for Agro-Pastoralists

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr> Chi-Square	Standardized Estimate	Odds Ratio
Intercept	1	3.0319	0.6295	23.1941	0.0001	.	.
Birth	1	-0.9215	0.2545	13.1138	0.0003	-0.219529	0.398
Sibs	1	-1.4695	0.2993	24.1004	0.0001	-0.341167	0.230

Table 8
PROC LOGISTIC summary of backward elimination for AGRO-PASTORALISTS

PROC LOGISTIC - Summary of Backward Elimination Procedure for Agro-Pastoralists

Step	Variable Removed	Number In	Wald Chi-Square	Pr> Chi-Square
1	WEALTHCT	6	0.3898	0.5324
2	SEX	5	0.5398	0.4625
3	WIFE	4	0.7408	0.3894
4	WEALTHTS	3	0.7593	0.3836
5	AGESET	2	1.3217	0.2503

Results for the pastoralist population present an altogether different position regarding sex of child. The bivariate analysis as shown in **Appendix A** Table 24 indicates that of 137 pastoralist children who ever attended school 45 or 13.39% are females whereas 92 or 27.30% are males. Thus it appears that pastoralist male children are twice as likely as their female counterparts to be selected to attend school. PROC LOGISTIC results shown in **Table 9** removed several variables from the analysis. However, as seen in **Table 10** the sex of child variable was retained as it did not meet the 0.05 significance level for removal from the model. This same run introduces an odds ratio of 2.452 confirming that males rather than females are almost two and one-half times more likely to be sent to school.

Table 9
PROC LOGISTIC summary of backward elimination for PASTORALISTS

PROC LOGISTIC - Summary of Backward Elimination Procedure for Pastoralists

Step	Variable Removed	Number In	Wald Chi-Square	Pr> Chi-Square
1	WEALTHTS	6	0.00244	0.9606
2	WIFE	5	0.0247	0.8750
3	WEALTHCT	4	0.1026	0.7478
4	SIBS	3	0.9147	0.3389

Table 10
PROC LOGISTIC (main effects) with backward elimination for PASTORALISTS

PROC LOGISTIC - Analysis of Maximum Likelihood Estimates for Pastoralists

Variable	DF	Parameter Estimate	Standard Error	Wald Chi-Square	Pr> Chi-Square	Standardized Estimate	Odds Ratio
Intercept	1	-0.7344	0.5645	1.6925	0.1933	.	.
Birth	1	-0.6323	0.2138	8.7449	0.0031	-0.148501	0.531
Sex	1	0.8969	0.2057	19.0159	0.0001	0.247440	2.452
Ageset	1	-0.7390	0.2335	10.0182	0.0016	-0.190818	0.478

As well as providing a table containing the statistically significant variables the PROC LOGISTIC procedure also furnishes a summary of those variables which met the 0.05 significance level for removal from the model. They are reproduced at this point in the interests of continuity. Discussion of these results can be found within the context of the predictions.

Table 11
PROC LOGISTIC summary of backward elimination for ALL CHILDREN

PROC LOGISTIC - Summary of Backward Elimination Procedure for All Children

Step	Variable Removed	Number In	Wald Chi-Square	Pr> Chi-Square
1	WIFE	7	0.000023	0.9962
2	WEALTHTS	6	0.0915	0.7623
3	WEALTHCT	5	0.0780	0.7800
4	AGESET	4	3.0313	0.0817

Table 12
PROC LOGISTIC summary of backward elimination for MALES ONLY

PROC LOGISTIC - Summary of Backward Elimination Procedure for Males

Step	Variable Removed	Number In	Wald Chi-Square	Pr> Chi-Square
1	SEX	7	.	.
2	WEALTHTS	6	0.000356	0.9849
3	WIFE	5	0.000648	0.9797
4	WEALTHCT	4	0.1980	0.6558
5	AGESET	3	0.2144	0.6434

Table 13
PROC LOGISTIC summary of backward elimination for FEMALES ONLY

PROC LOGISTIC - Summary of Backward Elimination Procedure for Females

Step	Variable Removed	Number In	Wald Chi-Square	Pr> Chi-Square
1	SEX	7	.	.
2	WIFE	6	0.00227	0.9620
3	WEALTHTS	5	0.0588	0.8084
4	WEALTHCT	4	0.6632	0.4154

4.2 Analysis of Results in the Context of Predictions

Based on the data generated in these analyses, we turn now to a more in-depth or detailed analysis of the data within the context of the specific predictions generated in Chapter 3.

PREDICTION ONE - Sex of Child

The first prediction was of a bias against females in *Ariaal* society, which means males will be selected over females to attend school. **Appendix A,** Table 1 shows the results of the PROC FREQ bivariate, we see that in the total sample size of 1,071children, 119 females or 22.80% of females attend school whereas 181 males or 33.33% of males

attend school. As shown in **Table 1** the odds ratio for the variable sex is 1.714 indicating males are almost twice as likely to be selected to attend school over females.

These data support the first prediction of a bias against females in *Ariaal* society. The numbers indicate that females are less likely to be selected to attend school. When the data are broken down by subsistence pattern, we see that agro-pastoralists do not appear to make a distinction between male and female when selecting who will be sent to school. Pastoralists, on the other hand, seem to favour male children over female children, as the results clearly show that females are less likely to be sent to school.

PREDICTION TWO - Siblings Ever Attend School

The second prediction asserts that if siblings attend school then it is most likely that all children in a particular family will attend school. According to the PROC FREQ bivariate result, as seen in **Appendix A** Table 2, in the total sample, 224 or 33.33% of all the children who attended school, also had siblings who attended school, whereas only 76 or 19.05% of the children who attended school, had siblings who did not attend school. As shown in **Table 1**, the odds ratio for siblings is 0.490 indicating that children without siblings are half as likely to attend school, relative to children with siblings. This lends credence to the position that if one child in a particular family attends school then all other children are likely to attend as well.

When separated out for females and males, the results as seen in **Tables 3** and **5** confirm that parental schooling choices cluster in family units. That is, if parents send one particular child in a family they are likely to send other children in the family as well. For females only the bivariate results (see **Appendix A** Table 3) show 100 or 28.99% of the

female siblings of females attend school, whereas only 10.38% of the female siblings of females did not attend. For females, the PROC LOGISTIC procedure (**Table 3**) retained the siblings ever attend school variable and presented an odds ratio of 0.305 indicating that for females only female siblings are just over a third as likely to attend school.

Results for males only confirm the parental pattern of sending all the children in a family to school. As seen in **Table 5** the odds-ratio is 0.603 indicating that siblings of males are two-thirds as likely to attend school as not. Thus the prediction if siblings attend school then it is most likely that all children in a particular family will attend school is supported by these results.

PREDICTION THREE - Birth Order

The third prediction states that first- born males and females will not be selected to attend school due to their obligations as inheritors and brides. Instead later born children will be selected to attend school. For all children, bivariate results (see **Appendix A** Table 5) indicate that 102 or 39.38% of first born children attend school, while 198 or 24.38% of later born children attend school. Results for the PROC LOGISTIC (**Table 1**) run did not eliminate the variable birth order and supplied an odds ratio of 0.442 indicating that later born children are approximately half as likely to attend school as first born children. Thus, contrary to the prediction, the data indicate that first-born children are indeed selected over later born children to attend school.

Results for males and females in the context of birth order seem to substantiate the prediction that parents favour first born children over later born children for school attendance. Bivariate results (see **Appendix A** Table 6) for females only indicate 36 or

32.43% of first born females attend school versus 83 or 19.90% of later born females. For females only the results of the PROC LOGISTIC shown in **Table 3** retain the birth order variable as being statistically significant and offers an odds-ratio of 0.447. This indicates that later- born females are slightly less than half as likely than first-born females to be selected to attend school

Results for males only show a similar pattern as seen with all children and females only, that is, later born males are not selected to attend school. Bivariate results (see **Appendix A** Table 7) show 66 or 44.00% of first- born males attend school, versus 115 or 28.82% of later born males. The PROC LOGISTIC results seen in **Table 5** display an odds-ratio of 0.457 indicating that later born males are slightly less than half as likely as first born males to be selected to attend school. Thus the predication that first-born children will not be selected to attend school is not corroborated by the results of the logistic regression.

PREDICTION FOUR - Father's Age Set Affiliation

For all children, the results of the PROC FREQ bivariate analysis present a chi-square value of 0.001 for father's age-set (see **Appendix A** Table 8). 233 or 31.36% of the children who attended school came from the age-sets dated between 1964 and 1992 whereas 67 or 20.43% of the children who attended school came from age-sets dated between 1936 and 1950. However, the PROC LOGISTIC with backward elimination procedure as shown in **Table 11** removed the variable father's age set as it met the 0.05 significance level for removal from the model. While the logistic procedure removed this variable from the model the PROC FREQ bivariate results clearly indicate the majority of the children who attended school came from the more recent age-sets.

PROC FREQ bivariate (see **Appendix A** Table 9) results for females only indicate that 99 or 26.83% of females who attended school came from the more recent age-sets whereas 20 or 12.58% of females who attended school came from the older age-sets. The PROC LOGISTIC run as seen in **Table 3** retained this variable and presented an odds-ratio of 0.511 indicating that female children are half as likely to come from the recent age-sets dated 1964 to 1992 than the older age-sets dated 1936 to 1950. It appears for females only, the variable father's age set is statistically significant in parental decision making.

Results for males only as seen in the PROC LOGISTIC model **Table 12** indicate that father's age set is not statistically significant in determining whether males have ever been to school.

It appears that the variable father's age set exhibits some contradictory results when broken down for males and females. However, for all children the variable is important, and supports the assertion that children belonging to more recent age-sets would be more likely to attend school.

PREDICTION FIVE - Wife Number

The fifth prediction states that children of the first wife would be more likely to be sent to school. This is due to the first wife's status and position within the family, which allows her to exert more influence with her husband. Consequently, she is more likely to lobby for her own children to be sent to school. Results of the PROC LOGISTIC as shown in **Table 11** removed the variable wife number from the model.

At the time of the survey, the number of *Ariaal* men with more than one wife was rather limited. Forty-one households presented a total of 46 additional wives. While

logistic regression does make allowances for difference in size of numbers, the magnitude of the difference is probably too great to provide a comparable sample.

Results for females for PROC LOGISTIC as seen in **Table 13** and for males as seen in PROC LOGISTIC **Table 12** present the same pattern of results as seen with all children. That is, they show that wife number is not statistically significant in determining whether females or males will be selected to attend school.

PREDICTION SIX - Subsistence Pattern

As indicated earlier in this thesis, of the eighteen villages surveyed for this sample, three villages consist of relocated *Ariaal* who subsist predominantly through agricultural activities. The other fifteen villages are composed of families who subsist predominantly through pastoralist activities. According to the PROC FREQ bivariate analysis, (see **Appendix A** Table 14) of the 300 children in the survey who attended school, 45.67% or 137 came from pastoralist families, whereas the children of the agricultural villages constitute 163 or 54.33% of the total. At first glance, it could be concluded that regardless of subsistence pattern, each pattern accounts for roughly half the number of children who attended school. However, further analysis indicates that 20.18% of the children in the survey who attended school came from pastoralist families, whereas 41.58% of the children in the survey who attended school came from agricultural families. Thus those families who practice agriculture are two and one-half times more likely to send their children to school which is indicated by the odds ratio of 2.476 in **Table 1**. Thus the prediction that agro-pastoralists will be more likely to send their children to school is true.

PROC FREQ bivariate results (see **Appendix A** Table 15) show 74 or 39.78% of agro-pastoralist female children attend school whereas 45 or 13.16% of pastoralist female children attend school. Results of the PRO LOGISTIC as seen in **Table 3,** present an odds ratio of 3.841 indicating that agro-pastoralist females are almost four times as likely to attend school then their pastoralist peers.

According to the PROC FREQ bivariate results as seen in **Appendix A** Table 15 for males only, 92 or 26.82% of pastoralist males attended school whereas 89 or 43.20% of agro-pastoralist males attend school. These figures are quite similar, nevertheless according to the odds-ratio, as seen in **Table 5** for the PROC LOGISTIC model, agro-pastoralist males are 1.847 times or almost twice as likely to attend school as their pastoralist male counterparts.

In terms of subsistence pattern, the assertion that agro-pastoralists are more likely to send their children to school is substantiated by the data for all children, female children only and male children only, thus the predication is correct.

PREDICATION SEVEN AND EIGHT - Household Wealth

For all the samples run, that is all children, male children only, and female children only the variables Total Shillings and Total Cattle holdings as proxies for household wealth proved not to be statistically significant. All PROC LOGISTIC runs (see **Tables 11, 12,** and **13**) eliminated these variables as they met the 0.05 significance level for removal from the model. As the results indicate, predications seven and eight which state that wealthier families are more likely to send children to school over poorer families are not supported by these data.

4.3 Summary of Results

In conclusion, the small numbers (n=300) of *Ariaal* children who attend school indicate that the *Ariaal* are not participating in the educational opportunities at their disposal. The familial variables: birth order, sex of child, and whether siblings ever attended school appear to be the most significant variables in determining which children will be selected to attend school. To elaborate, those children who do attend school are much more likely to be male children rather then female children. Also, it appears that educating children clusters in families, that when one child is selected to attend school, all the children are more likely to attend school. Finally, first born children be they male or female are more likely to attend school then their later born siblings.

Variables centered on the parental generation also exert some influence on parental decision making. However, some qualifiers are necessary. Children born to fathers whose age-sets are Il-Kororo, marriage year 1992; Il-Kishili, marriage year 1978; and Il-Kimaniki, marriage year 1965 are more likely to be sent to school than children born to father's whose age-sets are Il-Mekuri, marriage year 1951; and Il-Kiliako, marriage year 1936. This result is hardly surprising being that the current (and only) school was built in 1970, thus children born to men in the older age-sets would not have had the same opportunity to attend an educational facility. Wife order proved to be of little statistical value, undoubtedly due to the small numbers of subsequent wives in the survey.

The final variable showing a consistent impact whether for all children, females only or males only is subsistence pattern. Families who practice agriculture are more than twice as likely as pastoral families to send their children to school. This is undoubtedly connected to the labour needs associated with each type of subsistence pattern. Cattle and small stock

require daily care thus labour needs are high on a daily basis. In contrast agriculture has short periods of intensive labour requirements, such as planting and harvesting seasons, leaving its practitioners free to engage in other pursuits.

Further to the above finding, it should be noted that agro-pastoralists are just as likely to send female children to school as they are to send male children. Pastoralists, on the other hand show a significant bias in favour of male children. The final variable household wealth whether in total shillings or total cattle holdings proved to be of little statistical value.

Overall, these data indicate that the selection of which children will attend school certainly is something more than a "lucky dip" or "happenstance" as suggested by Caldwell (1982). Rather, the patterns delineated by these analyses demonstrate that the choice of which children attend school is based on several related familial, and subsistence factors, many of which were predictable from a knowledge of *Ariaal* culture. Of the eight variables predicated to have an impact on parental selection, five were shown to indeed have an impact — birth order, sex of child, siblings ever attend school, father's age-set affiliation and subsistence pattern — while three did not appear to have any impact on parental selection — wife number, total shillings and total cattle holdings.

The results of this statistical inquiry provide a clear indication of how cultural patterns and traditions play a role in impeding the progress of female children's entry into the educational system. While these results are indicative of the parental schooling choices being made among the *Ariaal* of Karare; Chapter Five will explore some further political, economic and institutional forces which also influence, constrain and complicate parental schooling decisions.

CHAPTER 5

A SYNTHESIS

5.1 Political Economy

As the data in Chapter 4 indicate, the selection of which children attend school in *Ariaal* society is a result of careful consideration by *Ariaal* parents based on their cultural patterns and traditions. It is not, as Caldwell noted in his 1982 book Theory of Fertility Decline, a random selection, a "lucky-dip" or a happenstance. It would seem however, that in this treatment of the *Ariaal*, 'culture' has been reduced to eight independent and one dependent variable. How does the researcher account for or measure the policies and changes that the economy of modern humanity, neighbouring tribes, missionaries or even the Kenyan government has brought to the lives of the *Ariaal*?

It is the burgeoning field of demography, which provides a viable explanation for a synthesis of culture (in terms of easily identifiable traits), and the wider political economy in which a 'culture' finds itself. Demographic theory also provides the best working definition of culture and it is in this definition that we find the best explanation for why culture is the primary determinant in parental decision making.

Demography is "the study of the statistics of birth, death, disease, migration, etc. as illustrating the conditions of life in communities" (Oxford Dictionary 8th ed. 1990). The application of demographic principles to the study of the conditions of life in communities is a relatively new technique employed in anthropology. A typical demographic analysis uses a mathematical equation, "in which the demographic behaviour in question (fertility, age at marriage, etc.) is the left-hand term (i.e. the dependent variable) and the factors that influence

that behaviour (education, occupation, etc.) are the right-hand term (i.e. the set of independent variables)" (Kertzer 1995: 137).

The subsequent results of demographic analysis often explain *what* is happening but not *why* it is happening. This, of course, is the central question in all social science research. Why does a particular group do something in a particular way? Explanations of particular behaviours often center on a vague notion of 'culture,' however culture itself is never adequately explained. Demographers themselves are keenly aware of this paradox: "the problem of culture – lamented by some demographers, championed by others, and until recently ignored by most – just will not go away. The issue of culture goes to the heart of the explanatory problems faced in demographic research. Indeed, the demographer's quandary can serve as a model of the problem faced by all who attempt to explain social behaviour" (Kertzer 1995:137).

As opposed to the traditional 19th century adaptionist or ideational explanation of culture Keesing (1974: 89) urged the practitioners of anthropology to view culture as "a system of knowledge." Kertzer concurs (1995:144) noting the traditionalist approaches to culture "view culture as a laundry list of traits" trapping its inhabitants into a series of behaviours from which they can never escape. Demographers, as did Keesing in his 1974 treatment of the subject of culture, have challenged the traditionalist view, presenting fresh approaches to the study of and explanation of culture. For example, Penn Handwerker argues:

> Culture cannot be seen as a set of variables other than economic, political, social religious, and psychological, for culture is not distinct from these phenomena. Culture thus refers to the content and structural specifications that people use to define economic,

> political, social, religious, and psychological factors. (Quoted in Kertzer 1995:143)

This new approach to culture, champions the idea of *agency*, that is the focus is on individuals and how they manipulate norms and beliefs to serve their own needs.

In her work in the Gambia, Caroline Bledsoe writes "rather than focusing exclusively on what the rules are, and to whom they apply, we can ask how people *select* among alternative rules to justify their behaviour" (quoted in Kertzer 1995:145). Philip Kreager argues "cultural systems, properly viewed, do not lay down any absolute code of conduct but, rather, entail an endless process of negotiation" (quoted in Kertzer 1995:145). Susan Greenhalgh argues "culture is like a spice rack of ideas and practices from which people choose depending on the menu of opportunities and constraints posed by their environments" (quoted in Kertzer 1995:146).

Thus, we come to a working definition of culture. It involves agency, individual action, norms and beliefs and the environment (both social and physical). Arguably, the point is, there is not a "prime mover" or a single explanation for which children are sent to school, instead there will be a host of factors which influence parental decision making. Thus, demography's new understanding of 'culture' allows for the use of the term, not as a static list of traits that trap its practitioners but as a dynamic entity, which allows for change. Perhaps it would be easier to conceptualize culture if it had a new name, a name that took into account its holistic approach to the conditions of life in communities. For now however, the term culture has to suffice.

Returning the focus to the *Ariaal*. They have to live and act in their society. This means responding to and negotiating with or against all that impinges on it, be that the

Kenyan government's educational policy, Catholic missionaries, educational policies, multinational hiring practices or neighbouring agro-pastoralists. These will all impact on decision making. However, as Kertzer (1995:153) points out: "people's interests are themselves defined by their culture, as are their means for achieving them. The choices they have to make, in short, are limited culturally and constrained in complicated ways by a variety of political, economic and institutional forces."

5.2 Further Barriers to Female Education

This study is of importance because it moves beyond determining the outcomes of female education to exploring the reasons why female children are or are not sent to school in the first place. This research has shown that *Ariaal* parents do indeed make informed choices based on cultural practices in determining which children will be sent to school. But, what of the constraining and complicated ways of political, economic and institutional forces what we might call 'outside influences' which may impact on parental selection?

According to Bledsoe and Cohen (1993) "in countries where opportunities for female education have increased, many more girls now seek to prolong their school careers, a goal that most national policies as well as family elders declare incompatible with motherhood." Bledsoe and Cohen (1993) also note change has to come in two areas – within the local community and at the national level. Attitudinal change at the community level is necessary if female attendance rates are to rise. However, putting aside this community bias for a moment, universal female education may still be a distant reality in light of political, economic and institutional forces, which appear to entrench community biases.

There are a myriad of political, economic and institutional forces which continue to make the goal of universal female education unattainable. The first of these to be discussed, in more detail below, explores the high cost of education, the lack of access to educational facilities, and the lack of employment opportunities. The second 'force' to be discussed is centered on the work of Mensch and Lloyd who outline school and classroom dynamics which point to a systematic bias against female students. The final topic is an investigation, carried out by Robert Clark, of multinational hiring practices favouring uneducated women, thereby discouraging their attendance at school.

In terms of cost, public education is a First World universal right whereas in many parts of the Third World, parents are expected to contribute towards the cost of educating their children. In Pakistan, as Sathar and Lloyd (1994: 110) point out, "the cost of primary schooling for one child in public school could represent 5-20 percent of a family's average resources per year."

Not just the high cost, but the lack of educational facilities or even access to educational facilities in many developing countries has been duly noted by many researchers investigating the issue of female education (Sathar & Lloyd 1994, Bledsoe, Johnson-Kuhn, Haaga 1999, New Internationalist 1999 and Lloyd & Gage-Brandon 1994). Working in Kenya, Agostino Zamberia (1996) has investigated Kenya's failed educational policy. He argues that regional inequalities and a lack of national focus are the primary causes of this failure (Zamberia 1996:47). Coupled with the failed education policy is a stagnant economy resulting in a lack of employment opportunities for those students who do manage to acquire an education.

After independence in 1963, Prime Minister Jomo Kenyatta embraced formal schooling as a vehicle for effective nation building (Zamberia 1996:52). It was assumed that educated skilled graduates would be needed to fill new jobs that would open up with the expansion of the economy and to replace the skilled white colonialist workers who would return to their native England. Thus education would serve as the tool to increase skills and knowledge, to deal with new ideas and to provide a vehicle for the import of a different culture.

Many communities shared Kenyatta's ideology and through the philosophy of *harambee* or self-help Kenyans began to build schools in their own communities. To-date Kenyans have four types of secondary schools.

1. Maintained aided schools: these schools are boarding and day schools that are fully maintained or financed by the government.
2. Assisted schools: these are schools that were initially started through *harambee,* but the government provides assistance in the form of teachers while the local population provides supplies.
3. Unaided *harambee* schools: these are schools that are started, funded, supported and entirely managed by the local community.
4. Unaided private schools: entrepreneurs who are seeking to make profits establish these schools. Christian churches and Quranic institutions also run private schools in Kenya (Zamberia 1996:56).

Zamberia 1996:53 notes that Kenya's secondary education system experienced rapid growth and expansion in the period after independence because the "government of Kenya saw [higher levels] of formal schooling as the panacea for effectual national building."

Zamberia (1996:59-60), however, is critical and sceptical of the proclaimed success of this "self-help" philosophy. He argues that access to education is not equal in terms of regions or gender or social groups. The reasons for this include racist attitudes towards the education of Africans; the impact of Christian evangelizing efforts; and the influence of political forces.

Zamberia (1996: 57) argues that a successful educational system must be a state sponsored initiative. In relying on "self-help" for the growth of secondary education in Kenya, the Kenyan government was unable to "signal" modernity and development in competition with other groups and organisations. In other words, Kenya was unable to get across its own development philosophy because other aid agencies, that were in fact helping to build the schools, brought their own development agendas.

A second problem with secondary education is that Kenya is unable to sustain the high rate of employment it experienced shortly after independence. In 1986 a little over twenty years after the expected promises of development and education, 26.8% of females and 17.4% of males who had completed form 3 – 4, which is the highest level before college, were unemployed (Zamberia 1996:64). Thus initial parental inputs or the costs of educating children did not necessarily result in guaranteed profits in the form of future employment for the children of many Kenyan parents who had embraced the educational system.

Regional disparities in the quality and quantity of schools in Kenya reflect differential penetration by colonialism. Those regions that proved valuable to colonialists also became centers of urbanization. Other regions that lacked any economic value such as the arid deserts of the northern half of the country, specifically the home of the *Rendille*, *Ariaal*, and *Samburu*, were left alone. Table five shows the distribution of secondary schools by province and category in 1986 in Kenya.

Figure 8

Number of Secondary Schools by Province and Category, 1986

Province	Maintained	Assisted	Unaided *Harambee*	Unaided Private	Total
Central	162	240	101	28	531
Eastern	106	155	91	46	398
Coast	58	24	21	26	129
North Eastern	**10**	**1**	**-**	**-**	**11**
Nyanza	106	183	113	48	450
Rift Valley	131	205	74	53	463
Western	88	129	94	13	324
Nairobi	37	4	-	48	89
Total	698	941	494	262	2,395

Source: Zamberia, Agostina M., Self-Help Secondary Education in Kenya. Page 56.

Zamberia (1996:47) also notes that while the number of schools has indeed increased in Kenya, they are not evenly distributed with respect to gender and region. He further argues that educational benefits are distributed in favour of the economically and politically dominant districts and provinces in the country. Thus, there are tremendous between and with-in group differences in Kenya. Zamberia (1996:57) argues "there is nothing special about regions and ethnic groups per se to account for these variations: rather they reflect social and economic factors such as occupational structure and income which themselves vary between regions and ethnic groups. These variations reflect differential penetration by colonialism as measured by the level of urbanization, cash crop production, employment opportunities and so." Furthermore, villages or groups may not even be geographically situated near a school, rendering moot any parental decision making in terms of school attendance. The lack of regional employment opportunities for educated people, the lack of

infrastructure, and the idea of out-migration of the young in order to seek employment means education is hardly appealing to many rural-based Kenyan parents.

In conducting interviews with teachers and students as well as observing day-to-day life in several Kenyan classrooms, Mensch and Lloyd (1997) found compelling evidence for a systematic bias against female students. On the part of teachers, the underlying attitude seemed to be "uncharitable" towards girls. According to Mensch & Lloyd (1997:49), classroom observers, who were given a short gender training course, recounted numerous episodes where teachers maligned or ridiculed female students. Indeed teachers seemed to go out of their way to do so. Further to this, they note "to the extent that teachers have a preference they favour boys" (Mensch & Lloyd 1997:52). Their study also found that teachers seem to tolerate a high level of sexual harassment of female students by male students and in many cases teachers are often the harassers themselves (Mensch & Lloyd 1997: 54-58). Clearly, for girls, schools do not constitute a safe learning environment.

According to Caldwell (1979:240) "the school reading books generally assume that children are dependent [and] that the husband must farm (or work in an office) while his wife undertakes the domestic work." Thus, even the curriculum, as Caldwell notes in his 1979 work, is not conducive to the liberation of girls from oppressive traditions and cultural practices. This is partly due to the fact that many of the texts come from the minds of Western educators who still see the role of women as wives and mothers. Thus, while it is understood that universal education will aid in the process of economic development, and free the nation from poverty; it is not women who will be at the forefront of this change, but — rather as we saw in Western civilization — men; despite the fact that "women's education may actually be more salient than men's for economic growth" (Benavot 1989).

A final disturbing factor, which may be a further impediment to education in the Third World is discussed by Robert Clark (1996: 44) where he concludes the investment and hiring practices of multinational corporations (MNC) discourage high levels of education of women.

Clark (1992:44) used panel regression analysis to prove that multinational corporation investment in Second and Third World countries has slowed the entry of women into higher education in sixty-six non-core or Third World countries and forty-four peripheral or Second World nations. Non-core or Third World countries refers to "those nations apparently outside the first (advanced capitalist) and second (state-socialist) worlds. Most of the countries of the Third World are in Latin American, Africa and Asia and they contain over 70% of the population of the world" (Johnston, Gregory and Smith 1986:484).

Clark argues there are three very compelling reasons for slowed entry of females into higher education. The first reason states that "MNC investment often entails ideological changes that impede women's progress" (Clark 1992:38). Despite women's liberation, western ideology continues to see a woman's role as in the home ignoring woman's socio-economic or political roles. In addition to their development dollars, MNC's also bring this ideology when they chose to invest in Second or Third world countries.

The second reason women are denied access to higher education in MNC developed countries stems from an image of women as "breeders and feeders." In essence this position argues that women are needed to produce the next generation of "cheap labour" and "hungry consumers" (Clark 1992:39). Anything that might turn women away from fulfilling this role, such as higher education, is a threat to the status quo.

Finally, Clark (1992:39) notes competition for MNC investments is fierce. Those non-core or Third World nations able to sway the competition are those who are "most likely to discipline relevant work-forces and to limit regulations." In non-core nations the most relevant work force is the cheapest and most malleable – that is, women. Again, higher education threatens the malleability of this relevant work force.

Thus, it would seem that a great many political, economic and institutional forces continue to impede women's entry into the educational arena. However, the question remains as to whether correcting national policies would change attitudes at the community level. History (Bodley 1998) has demonstrated that it is impossible to force people to change and that in a situation of forced change, people resist new ideas, values, and technologies by erecting psychological barriers.

Yet, as Ballara (1991:1) points out:

> Acquiring literacy allows silent women to find a language and express their needs, interest and concerns. Literacy activities for and with women motivate the organization of women's groups to support collective demands and to seek active participation in development and a better position in society. In this sense, literacy for women is empowering.

In placing an emphasis on educating women, women could in effect become the instruments of change, a role that runs contrary to their subordinate position in society in most of the developing world. In their new role, women could indeed gain more power and flaunt traditional roles, however this increase in females' power may be perceived as a decrease in males' power.

We can see then, that it is important that attitudinal shifts should occur simultaneously among men, women and national governments. Armed with the knowledge

that cultural factors are indeed the reason why female children are not selected to attend school this would allow national policies to focus public service campaigns aimed at changing attitudes by outlining the positive benefits of female education.

It is not just enough to convince First World donor countries that female education is important, it is more important to convince the inhabitants of the Third World. However, it needs to be remembered that the governments of First World countries have had over a century to recognize the importance of universal education and to make the financial commitment to support and sustain universal education. Secondly, over the past century, First World countries have been able to develop an unbiased gender as well as culturally sensitive curriculum. And finally, the Third World has seen fit to ignore corporate demands and pressures in order to deliver a curriculum which is aimed at developing critical thinking skills in its students. When the same conditions are reached in the Second and Third World as exist in the First World; thus indicating a shift in thinking regarding education at the national level, coupled with attitudinal shifts are the local level, only then will there be an appreciation for the positive benefits of educating *everyone* in the world

5.3 Future Research

This study shows us the pattern of parental decision making – it shows us *what* parents are doing at a particular moment in time. However, this is purely an etic approach which is "a perspective using concepts, categories, and rules derived from science; an outsider's perspective" (Nanda 1994:467). What it lacks, is the emic perspective, "a perspective that uses concepts, categories and distinctions that are meaningful to participants in a culture" (Nanda 1994:467). This research would be richer if the *Ariaal* voice was heard

throughout. Future research focused on asking the *Ariaal* to articulate the reasons why girls are selected less often than boys to attend school would be an excellent starting point for developing programs aimed at addressing attitudinal change at the community level.

This data also pointed out a significant discrepancy between agro-pastoralist and pastoralist groups in terms of their commitment to female education. Sex of child was not a major factor for agro-pastoralists when selecting which children would attend school. Indeed, equal numbers of female and male children were selected to attend. However, as the data showed sex of child was extremely important in the pastoralist sample where male children are over twice as likely as their female peers to attend school. In addition to this finding, the agro-pastoralist population contributed more than half the number of children who had ever attended school. This is surprising seeing as they constituted just over a third of the study population. Obviously, there is some social dynamic not accounted for in the variables in this study, which warrants further investigation.

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APPENDIX A

Results of the bivariate analysis, derived from the SAS PROC FREQ module, and presented here as chi-squared values show the impact of each independent variable on the dependent variable.

Table 1

Independent Variable One - Sex Of Child (All Children)

Ever attend school		Females	Males	Total
frequency	1	119	181	300
percent		11.17	17.00	28.17
row percent		39.67	60.33	
col percent		22.80	33.33	
frequency	2	403	362	765
percent		37.84	33.99	71.83
row percent		52.68	47.32	
col percent		77.20	66.67	
	Total	522	543	1065
		49.01	50.99	100.00

Frequency Missing = 6

Statistics for Table of School by Sex (All Children)

Statistic	DF	Value	Prob
Chi-Square	1	14.602	0.001
Likelihood Ratio Chi-Square	1	14.690	0.001
Continuity Adj. Chi-Square	1	14.086	0.001
Mantel-Haenszel Chi-Square	1	14.589	0.001
Fisher's Exact Test (Left)			8.38E-05
(Right)			1.000
(2-Tail)			1.35E-04
Phi Coefficient		-0.117	
Contigency Coefficient		0.116	
Cramer's V		-0.117	

Effective Sample Size = 1065
Frequency Missing = 6

Table 2

Independent Variable Two - Siblings Attend School (All Children)

Ever attend school		Siblings 1	Siblings 2	Total
frequency	1	224	76	300
percent		20.92	7.10	28.01
row percent		74.67	25.33	
col percent		33.33	19.05	
frequency	2	448	323	771
percent		41.83	30.16	71.99
row percent		58.11	41.89	
col percent		66.67	80.95	
	Total	672	399	1071
		62.75	37.25	100.00

Statistics for Table of School by Siblings Attend School (All Children)

Statistic	DF	Value	Prob
Chi-Square	1	25.337	0.001
Likelihood Ratio Chi-Square	1	26.301	0.001
Continuity Adj. Chi-Square	1	24.634	0.001
Mantel-Haenszel Chi-Square	1	25.314	0.001
Fisher's Exact Test (Left)			1.000
(Right)			2.19E-07
(2-Tail)			3.68E-07
Phi Coefficient		0.154	
Contigency Coefficient		0.152	
Cramer's V		0.154	

Effective Sample Size = 1071

Table 3

Independent Variable Two - Siblings Attend School (Females ONLY)

Ever attend school		Siblings 1	Siblings 2	Total
frequency	1	100	19	119
percent		18.94	3.6	22.54
row percent		84.03	15.97	
col percent		28.99	10.38	
frequency	2	245	164	409
percent		46.40	31.06	77.46
row percent		59.90	40.10	
col percent		71.01	89.62	
	Total	345	183	528

	65.34	34.66	100.00

Statistics for Table of School by Siblings Attend School (Females ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	23.703	0.001
Likelihood Ratio Chi-Square	1	26.093	0.001
Continuity Adj. Chi-Square	1	22.649	0.001
Mantel-Haenszel Chi-Square	1	23.654	0.001
Fisher's Exact Test (Left)			1.000
(Right)			3.25E-07
(2-Tail)			6.12E-07
Phi Coefficient		0.212	
Contigency Coefficient		0.207	
Cramer's V		0.212	

Effective Sample Size = 528

Table 4

Independent Variable Two - Siblings Attend School (Males ONLY)

		Siblings		Total
Ever attend school		1	2	
frequency	1	124	57	181
percent		22.59	10.38	32.97
row percent		68.51	31.49	
col percent		37.92	25.68	
frequency	2	203	165	638
percent		36.98	30.05	67.03
row percent		55.16	44.84	
col percent		62.08	74.32	
	Total	327	222	549
		59.56	40.44	100.00

Statistics for Table of School by Siblings Attend School (Males ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	8.971	0.003
Likelihood Ratio Chi-Square	1	9.126	0.003
Continuity Adj. Chi-Square	1	8.426	0.004
Mantel-Haenszel Chi-Square	1	8.955	0.003
Fisher's Exact Test (Left)			0.999
(Right)			1.73E-03

(2-Tail)		3.05E-03
Phi Coefficient	0.128	
Contigency Coefficient	0.127	
Cramer's V	0.128	

Effective Sample Size = 549

Table 5

Independent Variable Three - Birth Order (All Children)

Ever attend school		Birth Order 1	Birth Order 2	Total
frequency	1	102	198	300
percent		9.52	18.49	28.01
row percent		34.00	66.00	
col percent		39.38	24.38	
frequency	2	157	614	771
percent		14.66	57.33	71.99
row percent		20.36	79.64	
col percent		60.62	75.62	
	Total	259	812	1071
		24.18	75.82	100.00

Statistics for Table of School by Birth Order (All Children)

Statistic	DF	Value	Prob
Chi-Square	1	21.905	0.001
Likelihood Ratio Chi-Square	1	20.970	0.001
Continuity Adj. Chi-Square	1	21.167	0.001
Mantel-Haenszel Chi-Square	1	21.884	0.001
Fisher's Exact Test (Left)			1.000
(Right)			3.28E-06
(2-Tail)			5.30E-06
Phi Coefficient		0.143	
Contigency Coefficient		0.142	
Cramer's V		0.143	

Effective Sample Size = 1071

Table 6

Independent Variable Three - Birth Order (Females ONLY)

Ever attend school		Birth Order 1	Birth Order 2	Total
frequency	1	36	83	119
percent		6.82	15.72	22.54
row percent		30.25	69.75	
col percent		32.43	19.90	
frequency	2	75	334	409
percent		14.20	63.26	77.46
row percent		18.34	81.66	
col percent		67.57	80.10	
	Total	111	417	528
		21.02	78.98	100.00

Statistics for Table of School by Birth Order (Females ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	7.882	0.005
Likelihood Ratio Chi-Square	1	7.412	0.006
Continuity Adj. Chi-Square	1	7.180	0.007
Mantel-Haenszel Chi-Square	1	7.867	0.005
Fisher's Exact Test (Left)			0.998
(Right)			4.49E-03
(2-Tail)			7.04E-03
Phi Coefficient		0.122	
Contigency Coefficient		0.121	
Cramer's V		0.122	

Effective Sample Size = 528

Table 7

Independent Variable Three - Birth Order (Males ONLY)

Ever attend school		Birth Order 1	Birth Order 2	Total
frequency	1	66	115	181
percent		12.02	20.95	32.97
row percent		36.46	63.54	
col percent		44.00	28.82	
frequency	2	84	284	368
percent		15.30	51.73	67.03
row percent		22.83	77.17	
col percent		56.00	71.78	
	Total	150	399	549
		27.32	72.68	100.00

Statistics for Table of School by Birth Order (Males ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	11.364	0.001
Likelihood Ratio Chi-Square	1	11.069	0.001
Continuity Adj. Chi-Square	1	10.688	0.001
Mantel-Haenszel Chi-Square	1	11.343	0.001
Fisher's Exact Test (Left)			1.000
(Right)			6.16E-04
(2-Tail)			1.07E-03
Phi Coefficient		0.144	
Contigency Coefficient		0.142	
Cramer's V		0.144	

Effective Sample Size = 549

Table 8

Independent Variable Four- Father's Age Set Affiliation (All Children)

Ever attend school		Age Set 1	Age Set 2	Total
frequency	1	233	67	300
percent		21.76	6.26	28.01
row percent		77.67	22.33	
col percent		31.36	20.43	
frequency	2	510	261	771
percent		47.62	24.37	71.99
row percent		66.15	33.85	
col percent		68.64	79.57	
	Total	743	328	1071
		69.37	30.63	100.00

Statistics for Table of School by Father's Age Set Affiliation (All Children)

Statistic	DF	Value	Prob
Chi-Square	1	13.487	0.001
Likelihood Ratio Chi-Square	1	14.013	0.001
Continuity Adj. Chi-Square	1	12.950	0.001
Mantel-Haenszel Chi-Square	1	13.474	0.001
Fisher's Exact Test (Left)			1.000
(Right)			1.25E-04
(2-Tail)			2.18E-04

Phi Coefficient	**0.112**
Contigency Coefficient	**0.112**
Cramer's V	**0.112**

Effective Sample Size = 1071

Table 9

Independent Variable Four- Father's Age Set Affiliation (Females ONLY)

Ever attend school		Age Set 1	Age Set 2	Total
frequency	1	99	20	119
percent		18.75	3.79	22.54
row percent		83.19	16.81	
col percent		26.83	12.58	
frequency	2	270	139	409
percent		51.14	26.33	77.46
row percent		66.01	33.99	
col percent		73.17	87.42	
	Total	369	159	528
		69.89	30.11	100.00

Statistics for Table of School by Father's Age Set Affiliation (Females ONLY)

Statistic	DF	Value	Prob
Chi-Square	**1**	**12.926**	**0.001**
Likelihood Ratio Chi-Square	**1**	**14.030**	**0.001**
Continuity Adj. Chi-Square	**1**	**12.122**	**0.001**
Mantel-Haenszel Chi-Square	**1**	**12.901**	**0.001**
Fisher's Exact Test (Left)			**1.000**
(Right)			**1.53E-04**
(2-Tail)			**2.59E-04**
Phi Coefficient		**0.156**	
Contigency Coefficient		**0.155**	
Cramer's V		**0.156**	

Effective Sample Size = 528

Table 10

Independent Variable Four- Father's Age Set Affiliation (Males ONLY)

Ever attend school		Age Set 1	Age Set 2	Total
frequency	1	134	47	181
percent		24.41	8.56	32.97
row percent		74.03	25.97	
col percent		35.83	26.86	
frequency	2	240	128	368
percent		43.72	23.32	67.03
row percent		65.22	34.78	
col percent		64.17	73.14	
	Total	374	175	549
		68.12	31.88	100.00

Statistics for Table of School by Father's Age Set Affiliation (Males ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	4.342	0.037
Likelihood Ratio Chi-Square	1	4.430	0.035
Continuity Adj. Chi-Square	1	3.946	0.047
Mantel-Haenszel Chi-Square	1	4.334	0.037
Fisher's Exact Test (Left)			0.986
(Right)			0.023
(2-Tail)			0.041
Phi Coefficient		0.089	
Contigency Coefficient		0.089	
Cramer's V		0.089	

Effective Sample Size = 549

Table 11

Independent Variable Five- Wife Order (All Children)

Ever attend school		Wife Order 1	Wife Order 2	Total
frequency	1	221	79	300
percent		20.63	7.38	28.01
row percent		73.67	26.33	
col percent		30.78	22.38	

frequency	2	497	274	771
percent		46.41	25.58	71.99
row percent		64.46	35.54	
col percent		69.22	77.62	
	Total	718	353	1071
		67.04	32.96	100.00

Statistics for Table of School by Wife Order (All Children)

Statistic	DF	Value	Prob
Chi-Square	1	8.281	0.004
Likelihood Ratio Chi-Square	1	8.489	0.004
Continuity Adj. Chi-Square	1	7.870	0.005
Mantel-Haenszel Chi-Square	1	8.274	0.004
Fisher's Exact Test (Left)			0.999
(Right)			2.29E-03
(2-Tail)			3.82E-03
Phi Coefficient		0.088	
Contigency Coefficient		0.088	
Cramer's V		0.088	

Effective Sample Size = 1071

Table 12

Independent Variable Five- Wife Order (Females ONLY)

		Wife Order		Total
Ever attend school		1	2	
frequency	1	92	27	119
percent		17.42	5.11	22.54
row percent		77.31	22.69	
col percent		26.14	15.34	
frequency	2	260	149	409
percent		49.24	28.22	77.46
row percent		63.57	36.43	
col percent		73.86	84.66	
	Total	352	176	528
		66.67	33.33	100.00

Statistics for Table of School by Wife Order (Females ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	7.833	0.005

Likelihood Ratio Chi-Square	1	8.223	0.004
Continuity Adj. Chi-Square	1	7.226	0.007
Mantel-Haenszel Chi-Square	1	7.818	0.005
Fisher's Exact Test (Left)			0.999
(Right)			3.05E-03
(2-Tail)			5.61E-03
Phi Coefficient		0.122	
Contigency Coefficient		0.121	
Cramer's V		0.122	

Effective Sample Size = 528

Table 13

Independent Variable Five- Wife Order (Males ONLY)

Ever attend school		Wife Order 1	Wife Order 2	Total
frequency	1	129	52	181
percent		23.50	9.47	32.97
row percent		71.27	28.73	
col percent		35.25	28.42	
frequency	2	237	131	368
percent		43.17	23.86	67.03
row percent		64.40	35.60	
col percent		64.75	71.58	
	Total	366	183	549
		66.67	33.33	100.00

Statistics for Table of School by Wife Order (Males ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	2.576	0.109
Likelihood Ratio Chi-Square	1	2.611	0.106
Continuity Adj. Chi-Square	1	2.276	0.131
Mantel-Haenszel Chi-Square	1	2.571	0.109
Fisher's Exact Test (Left)			0.956
(Right)			0.065
(2-Tail)			0.123
Phi Coefficient		0.068	
Contigency Coefficient		0.068	
Cramer's V		0.068	

Effective Sample Size = 549

Table 14

Independent Variable Six - Subsistence Pattern (All Children)

Ever attend school		Subsistence Pattern 1	2	Total
frequency	1	137	163	300
percent		12.79	15.22	28.01
row percent		45.67	54.33	
col percent		20.18	41.58	
frequency	2	542	229	771
percent		50.61	21.38	71.99
row percent		70.30	29.70	
col percent		79.82	58.42	
	Total	679	392	**1071**
		63.40	36.60	**100.00**

Statistics for Table of School by Subsistence Pattern (All Children)

Statistic	DF	Value	Prob
Chi-Square	**1**	56.467	0.001
Likelihood Ratio Chi-Square	**1**	55.210	0.001
Continuity Adj. Chi-Square	**1**	55.411	0.001
Mantel-Haenszel Chi-Square	**1**	56.414	0.001
Fisher's Exact Test (Left)			9.04E-14
(Right)			0.001
(2-Tail)			1.27E-13
Phi Coefficient		-0.230	
Contigency Coefficient		0.224	
Cramer's V		-0.230	

Effective Sample Size = 1071

Table 15

Independent Variable Six - Subsistence Pattern (Females ONLY)

Ever attend school		Subsistence Pattern 1	2	Total
frequency	1	**45**	**74**	**119**
percent		**8.52**	**14.02**	**22.54**
row percent		**37.82**	**62.18**	
col percent		**13.16**	**39.78**	
frequency	2	**297**	**112**	**409**
percent		**56.25**	**21.21**	**77.46**
row percent		**72.62**	**27.38**	
col percent		**86.84**	**60.22**	
	Total	**342**	**186**	**528**

	64.77	35.23	100.00

Statistics for Table of School by Subsistence Pattern (Females ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	48.927	0.001
Likelihood Ratio Chi-Square	1	47.149	0.001
Continuity Adj. Chi-Square	1	47.414	0.001
Mantel-Haenszel Chi-Square	1	48.834	0.001
Fisher's Exact Test (Left)			6.80E-12
(Right)			1.000
(2-Tail)			9.56E-12
Phi Coefficient		-0.304	
Contigency Coefficient		0.291	
Cramer's V		-0.304	

Effective Sample Size = 528

Table 16

Independent Variable Six - Subsistence Pattern (Males ONLY)

Ever attend school		Subsistence Pattern 1	Subsistence Pattern 2	Total
frequency	1	92	89	181
percent		16.76	16.21	32.97
row percent		50.83	49.17	
col percent		26.82	43.20	
frequency	2	251	117	368
percent		45.72	21.31	67.03
row percent		68.21	31.79	
col percent		73.18	56.80	
	Total	343	206	549
		62.48	37.52	100.00

Statistics for Table of School by Subsistence Pattern (Males ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	15.629	0.001
Likelihood Ratio Chi-Square	1	15.432	0.001
Continuity Adj. Chi-Square	1	14.896	0.001
Mantel-Haenszel Chi-Square	1	15.600	0.001
Fisher's Exact Test (Left)			6.23E-05
(Right)			1.000
(2-Tail)			1.14E-04
Phi Coefficient			-0.169
Contigency Coefficient			0.166

Cramer's V	**-0.169**

Effective Sample Size = 549

Table 17

Independent Variable Seven - Household Wealth Total Shillings (All Children)

Ever attend school		Household Wealth 1	Household Wealth 2	Total
frequency	1	161	139	300
percent		15.03	12.98	28.01
row percent		53.67	46.33	
col percent		30.09	25.93	
frequency	2	374	397	771
percent		34.92	37.07	71.99
row percent		48.51	51.49	
col percent		69.91	74.07	
	Total	535	536	1071
		49.95	50.05	100.00

Statistics for Table of School by Household Wealth Total Shillings (All Children)

Statistic	DF	Value	Prob
Chi-Square	1	2.299	0.129
Likelihood Ratio Chi-Square	1	2.300	0.129
Continuity Adj. Chi-Square	1	2.097	0.148
Mantel-Haenszel Chi-Square	1	2.296	0.130
Fisher's Exact Test (Left)			0.943
(Right)			0.074
(2-Tail)			0.135
Phi Coefficient		0.046	
Contigency Coefficient		0.046	
Cramer's V		0.046	

Effective Sample Size = 1071

Table 18

Independent Variable Seven - Household Wealth Total Shillings (Females ONLY)

Ever attend school		Household Wealth 1	Household Wealth 2	Total
frequency	1	72	47	119
percent		13.64	8.90	22.54

row percent		60.50	39.50	
col percent		25.81	18.88	
frequency	2	207	202	409
percent		39.20	38.26	77.46
row percent		50.61	49.39	
col percent		74.19	81.12	
	Total	279	249	528
		52.84	47.16	100.00

Statistics for Table of School by Household Wealth Total Shillings (Females ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	3.620	0.057
Likelihood Ratio Chi-Square	1	3.647	0.056
Continuity Adj. Chi-Square	1	3.234	0.072
Mantel-Haenszel Chi-Square	1	3.614	0.057
Fisher's Exact Test (Left)			0.978
(Right)			0.036
(2-Tail)			0.061
Phi Coefficient		0.083	
Contigency Coefficient		0.083	
Cramer's V		0.083	

Effective Sample Size = 528

Table 19

Independent Variable Seven - Household Wealth Total Shillings (Males ONLY)

		Household Wealth		Total
Ever attend school		1	2	
frequency	1	89	92	181
percent		16.21	16.76	32.97
row percent		49.17	50.83	
col percent		34.77	31.40	
frequency	2	167	201	368
percent		30.42	36.61	67.03
row percent		45.38	54.62	
col percent		65.23	68.60	
	Total	256	293	549
		46.63	53.37	100.00

Statistics for Table of School by Household Wealth Total Shillings (Males ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	0.701	0.403

Likelihood Ratio Chi-Square	**1**	**0.700**	**0.403**
Continuity Adj. Chi-Square	**1**	**0.557**	**0.456**
Mantel-Haenszel Chi-Square	**1**	**0.699**	**0.403**
Fisher's Exact Test (Left)			**0.823**
(Right)			**0.228**
(2-Tail)			**0.414**
Phi Coefficient		**0.036**	
Contigency Coefficient		**0.036**	
Cramer's V		**0.036**	

Effective Sample Size = 549

Table 20

Independent Variable Eight - Household Wealth Cattle Holdings (ALL CHILDREN)

		Cattle Holdings		Total
Ever attend school		**1**	**2**	
frequency	**1**	167	133	**300**
percent		15.59	12.42	**28.01**
row percent		55.67	44.33	
col percent		31.63	24.49	
frequency	**2**	361	410	771
percent		33.71 ,	38.28	**71.99**
row percent		46.82 ,	53.18	
col percent		68.37 ,	75.51	
	Total	**528**	**543**	**1071**
		49.30	**50.70**	**100.00**

Statistics for Table of School by Household Wealth Cattle Holdings (ALL CHILDREN)

Statistic	**DF**	**Value**	**Prob**
Chi-Square	**1**	**6.759**	**0.009**
Likelihood Ratio Chi-Square	**1**	**6.768**	**0.009**
Continuity Adj. Chi-Square	**1**	**6.410**	**0.011**
Mantel-Haenszel Chi-Square	**1**	**6.752**	**0.009**
Fisher's Exact Test (Left)			**0.996**
(Right)			**5.65E-03**
(2-Tail)			**9.76E-.03**
Phi Coefficient		**0.079**	
Contigency Coefficient		**0.079**	
Cramer's V		**0.079**	

Effective Sample Size =1071

Table 21

Independent Variable Eight - Household Wealth Cattle Holdings (FEMALES ONLY)

Ever attend school		Cattle Holdings 1	Cattle Holdings 2	Total
frequency	1	74	45	119
percent		14.02	8.52	22.54
row percent		62.18	37.82	28.68
col percent		28.68	16.67	
frequency	2	184	225	409
percent		34.82	42.61	77.46
row percent		44.99	55.01	
col percent		71.32	83.33	
	Total	258	270	528
		48.86	51.14	100.00

Statistics for Table of School by Household Wealth Cattle Holdings (FEMALES ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	10.910	0.001
Likelihood Ratio Chi-Square	1	10.983	0.001
Continuity Adj. Chi-Square	1	10.233	0.001
Mantel-Haenszel Chi-Square	1	10.889	0.001
Fisher's Exact Test (Left)			1.000
(Right)			6.69E-04
(2-Tail)			1.19E-03
Phi Coefficient		0.144	
Contigency Coefficient		0.142	
Cramer's V		0.144	

Effective Sample Size =528

Table 22

Independent Variable Eight - Household Wealth Cattle Holdings (MALES ONLY)

Ever attend school		Cattle Holdings 1	Cattle Holdings 2	Total
frequency	1	93	88	181
percent		16.94	16.03	32.97
row percent		51.38	48.62	
col percent		34.44	31.54	
frequency	2	177	191	368
percent		32.24	34.79	67.03
row percent		48.10	51.90	

col percent		65.56	68.46	
	Total	270	279	549
		49.18	50.82	100.00

Statistics for Table of School by Household Wealth Cattle Holdings (MALES ONLY)

Statistic	DF	Value	Prob
Chi-Square	1	0.523	0.469
Likelihood Ratio Chi-Square	1	0.523	0.469
Continuity Adj. Chi-Square	1	0.400	0.527
Mantel-Haenszel Chi-Square	1	0.522	0.470
Fisher's Exact Test (Left)			0.792
(Right)			0.263
(2-Tail)			0.525
Phi Coefficient		0.031	
Contigency Coefficient		0.031	
Cramer's V		0.031	

Effective Sample Size =549

Table 23

Results Of Univariate Analysis For Agro-Pastoralists for Sex of Child

		Sex of Child		Total
Ever attend school		1	2	
frequency	1	74	89	163
percent		18.88	22.70	41.58
row percent		45.40	54.60	
col percent		39.78	43.20	
frequency	2	112	117	229
percent		28.57	29.85	58.42
row percent		48.91	51.09	
col percent		60.22	56.80	
	Total	186	206	392
		47.45	52.55	100.00

Statistics for Table of School by Sex for Agro-Pastoralists

Statistic	DF	Value	Prob
Chi-Square	1	0.470	0.493
Likelihood Ratio Chi-Square	1	0.471	0.493
Continuity Adj. Chi-Square	1	0.340	0.560
Mantel-Haenszel Chi-Square	1	0.469	0.493
Fisher's Exact Test (Left)			0.280
(Right)			0.785
(2-Tail)			0.538
Phi Coefficient		-0.035	

Contigency Coefficient	**0.035**
Cramer's V	**-0.035**

Effective Sample Size = 392

Table 24

Results Of Univariate Analysis For Pastoralists for Sex of Child

Ever attend school		Sex of Child 1	Sex of Child 2	Total
frequency	1	45	92	137
percent		6.69	13.67	20.36
row percent		32.85	67.15	
col percent		13.39	27.30	
frequency	2	291	245	536
percent		43.24	36.40	79.64
row percent		54.29	45.71	
col percent		86.61	72.70	
	Total	336	337	673
		49.93	50.07	100.00

Statistics for Table of School by Sex for Pastoralists

Statistic	DF	Value	Prob
Chi-Square	**1**	**20.70**	**0.001**
Likelihood Ratio Chi-Square	**1**	**20.407**	**0.001**
Continuity Adj. Chi-Square	**1**	**19.222**	**0.001**
Mantel-Haenszel Chi-Square	**1**	**20.041**	**0.00**
Fisher's Exact Test (Left)			**4.99E-06**
(Right)			**1.000**
(2-Tail)			**9.16E-06**
Phi Coefficient		**-0.173**	
Contigency Coefficient		**0.170**	
Cramer's V		**-0.173**	

Effective Sample Size = 673
frequency missing = 6

APPENDIX B

Results of Saturated PROC CATMOD for ALL CHILDREN

CATMOD PROCEDURE

Response: SCHOOL	Response Levels (R)= 2
Weight Variable: None	Populations (S)= 16
Data Set: KARARESC	Total Frequency (N)= 1065
Frequency Missing: 6	Observations (Obs)= 1065

POPULATION PROFILES

Sample	BIRTH	SIBS	SEX	SUBPAT	Sample Size
1	1	1	1	1	31
2	1	1	1	2	30
3	1	1	2	1	36
4	1	1	2	2	37
5	1	2	1	1	36
6	1	2	1	2	12
7	1	2	2	1	57
8	1	2	2	2	18
9	2	1	1	1	168
10	2	1	1	2	116
11	2	1	2	1	135
12	2	1	2	2	119
13	2	2	1	1	101
14	2	2	1	2	28
15	2	2	2	1	109
16	2	2	2	2	32

RESPONSE PROFILES

Response	SCHOOL
1	1
2	2

MAXIMUM-LIKELIHOOD ANALYSIS

Iteration	Sub Iteration	-2 Log Likelihood	Convergence Criterion	Parameter Estimates 1	2

0	0	1476.4035	1.0000	0	0
1	0	1148.3914	0.2222	-0.7676	0.3158
2	0	1137.299	0.009659	-0.9155	0.3917
3	0	1136.9471	0.000309	-0.9388	0.4079
4	0	1136.946	9.3033E-7	-0.9400	0.4088
5	0	1136.946	1.092E-11	-0.9400	0.4088

Parameter Estimates

Iteration	3	4	5	6	7	8
0	0	0	0	0	0	0
1	0.3900	-0.2017	-0.2910	0.0756	-0.0489	-0.0538
2	0.4762	-0.2843	-0.3469	0.0505	-0.0238	-0.0318
3	0.4948	-0.3055	-0.3596	0.0396	-0.0115	-0.0262
4	0.4960	-0.3067	-0.3603	0.0389	-0.0108	-0.0260
5	0.4960	-0.3067	-0.3603	0.0389	-0.0108	-0.0260

Parameter Estimates

Iteration	9	10	11	12
0	0	0	0	0
1	0.0431	-0.2532	-0.1058	-0.0606
2	0.0992	-0.2798	-0.1665	-0.0827
3	0.1213	-0.2727	-0.1809	-0.0906
4	0.1228	-0.2720	-0.1817	-0.0912
5	0.1228	-0.2720	-0.1817	-0.0912

MAXIMUM-LIKELIHOOD ANALYSIS-OF-VARIANCE TABLE

Source	DF	Chi-Square	Prob
INTERCEPT	1	91.73	0.0000
BIRTH	1	20.30	0.0000
SIBS	1	25.79	0.0000
SEX	1	11.01	0.0009
SUBPAT	1	14.24	0.0002
BIRTH*SIBS	1	0.19	0.6646
BIRTH*SEX	1	0.02	0.9020
BIRTH*SUBPAT	1	0.09	0.7653
SIBS*SEX	1	1.86	0.1731
SIBS*SUBPAT	1	8.84	0.0029
SEX*SUBPAT	1	4.71	0.0299
BIRTH*SIBS*SEX*SUBPAT	1	1.26	0.2619
LIKELIHOOD RATIO	4	1.42	0.8403

ANALYSIS OF MAXIMUM-LIKELIHOOD ESTIMATES

Effect	Parameter	Estimate	Standard Error	Chi-Square	Prob
INTERCEPT	1	-0.9400	0.0981	91.73	0.0000
BIRTH	2	0.4088	0.0907	20.30	0.0000
SIBS	3	0.4960	0.0977	25.79	0.0000
SEX	4	-0.3067	0.0924	11.01	0.0009
SUBPAT	5	-0.3603	0.0955	14.24	0.0002
BIRTH*SIBS	6	0.0389	0.0897	0.19	0.6646
BIRTH*SEX	7	-0.0108	0.0876	0.02	0.9020
BIRTH*SUBPAT	8	-0.0260	0.0870	0.09	0.7653
SIBS*SEX	9	0.1228	0.0901	1.86	0.1731
SIBS*SUBPAT	10	-0.2720	0.0915	8.84	0.0029
SEX*SUBPAT	11	-0.1817	0.0837	4.71	0.0299
BIRTH*SIBS*SEX*SUBPAT	12	-0.0912	0.0813	1.26	0.2619

Results of saturated PROC CATMOD for Females Only

CATMOD PROCEDURE

Response: SCHOOL	Response Levels (R)= 2
Weight Variable: None	Populations (S)= 16
Data Set: KARARESC	Total Frequency (N)= 528
Frequency Missing: 0	Observations (Obs)= 528

POPULATION PROFILES

Sample	BIRTH	SIBS	AGESET	SUBPAT	Sample Size
1	1	1	1	1	23
2	1	1	1	2	27
3	1	1	2	1	8
4	1	1	2	2	3
5	1	2	1	1	27
6	1	2	1	2	6
7	1	2	2	1	11
8	1	2	2	2	6
9	2	1	1	1	135
10	2	1	1	2	91
11	2	1	2	1	33
12	2	1	2	2	25
13	2	2	1	1	52
14	2	2	1	2	8

15	2	2	2	1	53
16	2	2	2	2	20

RESPONSE PROFILES

Response	SCHOOL
1	1
2	2

MAXIMUM-LIKELIHOOD ANALYSIS

Iteration	Sub Iteration	-2 Log Likelihood	Convergence Criterion	Parameter Estimates 1	2
0	0	731.96342	1.0000	0	0
1	0	491.23584	0.3289	-1.0841	0.2862
2	0	476.10965	0.0308	-1.4400	0.4157
3	0	474.23059	0.003947	-1.6303	0.4738
4	0	473.8968	0.000704	-1.7668	0.4820
5	0	473.78401	0.000238	-1.8928	0.4821
6	0	473.74275	0.0000871	-2.0181	0.4821
7	0	473.7276	0.000032	-2.1432	0.4821
8	0	473.72203	0.0000118	-2.2682	0.4821
9	0	473.71998	4.3241E-6	-2.3932	0.4821
10	0	473.71923	1.5906E-6	-2.5182	0.4821
11	0	473.71895	5.8513E-7	-2.6432	0.4821
12	0	473.71885	2.1526E-7	-2.7682	0.4821
13	0	473.71881	7.9188E-8	-2.8932	0.4821
14	0	473.7188	2.9132E-8	-3.0182	0.4821
15	0	473.71879	1.0717E-8	-3.1432	0.4821
16	0	473.71879	3.9425E-9	-3.2682	0.4821

	Parameter Estimates					
Iteration	3	4	5	6	7	8
0	0	0	0	0	0	0
1	0.3743	0.1284	-0.4078	0.004589	0.0760	-0.1239
2	0.4847	0.1777	-0.5593	-0.1076	0.1242	-0.1727
3	0.5135	0.2166	-0.6280	-0.2428	0.2073	-0.2700
4	0.5168	0.2278	-0.6422	-0.3703	0.3261	-0.3926
5	0.5167	0.2284	-0.6428	-0.4960	0.4516	-0.5182
6	0.5167	0.2284	-0.6428	-0.6212	0.5769	-0.6435
7	0.5167	0.2284	-0.6428	-0.7463	0.7020	-0.7686
8	0.5167	0.2284	-0.6428	-0.8714	0.8270	-0.8936
9	0.5167	0.2284	-0.6428	-0.9964	0.9520	-1.0186

10	0.5167	0.2284	-0.6428	-1.1214	1.0770	-1.1436
11	0.5167	0.2284	-0.6428	-1.2464	1.2020	-1.2686
12	0.5167	0.2284	-0.6428	-1.3714	1.3270	-1.3936
13	0.5167	0.2284	-0.6428	-1.4964	1.4520	-1.5186
14	0.5167	0.2284	-0.6428	-1.6214	1.5770	-1.6436
15	0.5167	0.2284	-0.6428	-1.7464	1.7020	-1.7686
16	0.5167	0.2284	-0.6428	-1.8714	1.8270	-1.8936

	Parameter Estimates			
Iteration	9	10	11	12
0	0	0	0	0
1	0.1713	-0.2983	0.1374	0.1137
2	0.3035	-0.4303	0.3461	0.2171
3	0.4207	-0.5430	0.5327	0.3368
4	0.5422	-0.6652	0.6712	0.4629
5	0.6677	-0.7907	0.7972	0.5885
6	0.7930	-0.9159	0.9225	0.7138
7	0.9181	-1.0410	1.0476	0.8389
8	1.0431	-1.1661	1.1726	0.9639
9	1.1681	-1.2911	1.2976	1.0889
10	1.2931	-1.4161	1.4226	1.2139
11	1.4181	-1.5411	1.5476	1.3389
12	1.5431	-1.6661	1.6726	1.4639
13	1.6681	-1.7911	1.7976	1.5889
14	1.7931	-1.9161	1.9226	1.7139
15	1.9181	-2.0411	2.0476	1.8389
16	2.0431	-2.1661	2.1726	1.9639

MAXIMUM-LIKELIHOOD ANALYSIS-OF-VARIANCE TABLE

Source	DF	Chi-Square	Prob
INTERCEPT	1	0.00	0.9746
BIRTH	1	6.72	0.0095
SIBS	1	7.71	0.0055
AGESET	1	1.31	0.2527
SUBPAT	1	12.32	0.0004
BIRTH*SIBS	1	0.00	0.9855
BIRTH*AGESET	1	0.00	0.9858
BIRTH*SUBPAT	1	0.00	0.9853
SIBS*AGESET	1	0.00	0.9842
SIBS*SUBPAT	1	0.00	0.9832
AGESET*SUBPAT	1	0.00	0.9831
BIRTH*SIBS*AGESET*SUBPAT	1	0.00	0.9848
LIKELIHOOD RATIO	4	12.76	0.0125

ANALYSIS OF MAXIMUM-LIKELIHOOD ESTIMATES

Effect	Parameter	Estimate	Standard Error	Chi-Square	Prob
INTERCEPT	1	-3.2682	102.8	0.00	0.9746
BIRTH	2	0.4821	0.1859	6.72	0.0095
SIBS	3	0.5167	0.1861	7.71	0.0055
AGESET	4	0.2284	0.1997	1.31	0.2527
SUBPAT	5	-0.6428	0.1831	12.32	0.0004
BIRTH*SIBS	6	-1.8714	102.8	0.00	0.9855
BIRTH*AGESET	7	1.8270	102.8	0.00	0.9858
BIRTH*SUBPAT	8	-1.8936	102.8	0.00	0.9853
SIBS*AGESET	9	2.0431	102.8	0.00	0.9842
SIBS*SUBPAT	10	-2.1661	102.8	0.00	0.9832
AGESET*SUBPAT	11	2.1726	102.8	0.00	0.9831
BIRTH*SIBS*AGESET*SUBPAT	12	1.9639	102.8	0.00	0.9848

Results of saturated PROC CATMOD for MALES only.

CATMOD PROCEDURE

Response: SCHOOL	Response Levels (R)= 2
Weight Variable: None	Populations (S)= 8
Data Set: KARARESC	Total Frequency (N)= 549
Frequency Missing: 0	Observations (Obs)= 549

POPULATION PROFILES

Sample	BIRTH	SIBS	SUBPAT	Sample Size
1	1	1	1	36
2	1	1	2	37
3	1	2	1	59
4	1	2	2	18
5	2	1	1	135
6	2	1	2	119
7	2	2	1	113
8	2	2	2	32

RESPONSE PROFILES

Response SCHOOL

1	1
2	2

MAXIMUM-LIKELIHOOD ANALYSIS

Iteration	Sub Iteration	-2 Log Likelihood	Convergence Criterion	Parameter Estimates 1	2	3
0	0	761.0756	1.0000	0	0	0
1	0	655.50052	0.1387	-0.5702	0.3456	0.3569
2	0	654.49656	0.001532	-0.6304	0.3988	0.3932
3	0	654.49499	2.3999E-6	-0.6331	0.4014	0.3948
4	0	654.49499	2.183E-11	-0.6331	0.4014	0.3948

	Parameter Estimates				
Iteration	4	5	6	7	8
0	0	0	0	0	0
1	-0.2036	0.1079	-0.0389	-0.2349	0.0150
2	-0.2139	0.0938	-0.0381	-0.2635	0.0371
3	-0.2134	0.0923	-0.0387	-0.2652	0.0387
4	-0.2134	0.0923	-0.0387	-0.2652	0.0387

MAXIMUM-LIKELIHOOD ANALYSIS-OF-VARIANCE TABLE

Source	DF	Chi-Square	Prob
INTERCEPT	1	28.67	0.0000
BIRTH	1	11.53	0.0007
SIBS	1	11.15	0.0008
SUBPAT	1	3.26	0.0711
BIRTH*SIBS	1	0.61	0.4352
BIRTH*SUBPAT	1	0.11	0.7431
SIBS*SUBPAT	1	5.03	0.0249
BIRTH*SIBS*SUBPAT	1	0.11	0.7434
LIKELIHOOD RATIO	0	.	.

ANALYSIS OF MAXIMUM-LIKELIHOOD ESTIMATES

Effect	Parameter	Estimate	Standard Error	Chi-Square	Prob
INTERCEPT	1	-0.6331	0.1182	28.67	0.0000
BIRTH	2	0.4014	0.1182	11.53	0.0007
SIBS	3	0.3948	0.1182	11.15	0.0008
SUBPAT	4	-0.2134	0.1182	3.26	0.0711
BIRTH*SIBS	5	0.0923	0.1182	0.61	0.4352
BIRTH*SUBPAT	6	-0.0387	0.1182	0.11	0.7431
SIBS*SUBPAT	7	-0.2652	0.1182	5.03	0.0249
BIRTH*SIBS*SUBPAT	8	0.0387	0.1182	0.11	0.7434

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