Education in Egypt:
The Impact of Family Size and Composition

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Abstract

Previous studies mainly in the U.S and to a much lesser extent in East and South East Asia found a negative association between family size and children's educational attainment. This is of concern as disparities in education by family size have implications on social mobility and social stratification. In this paper, I extend the literature on sib-size and children's education to Arab countries. With the exception of post-secondary education, enrollment of Arab students in pre-school, primary, preparatory, and secondary education lags behind not only the world average but also the average of developing countries (UNDP, 2003). Using Egypt Demographic and Health Survey (EDHS 2000), I examine how school enrollment, grade retention, and degree attainment of Egyptian children vary by age, gender, and region. In addition, I investigate the impact of child's gender as well as family size and composition on children's education.

INTRODUCTION

Sociologists have long been interested in the effects of family size, birth order, and parental education on children's academic performance as disparities in children's education have consequences on social stratification, social mobility, and overall educational attainment of the society (Mare and Chen, 1986). Most of the demographic and sociological literature on children's education and family characteristics focused on the United States and to a much lesser extent on East and Southeast Asia. Despite the relatively low educational attainment in the Arab world, I do not know of any study that studied the interrelation between family size and children's education within the Arab context.

This is unfortunate as the Arab Human Development Report 2003 had severe criticisms to the status of education in the Arab countries. With the exception of post-secondary education, enrollment of Arab students in pre-school, primary, preparatory, and secondary education lags behind not only the world average but also the average of developing countries. The problem is even more acute for girls and the poor especially in rural areas. This is coupled with decreasing quality and efficiency in schooling (UNDP, 2002, 2003). In Egypt, the most populous of Arab countries, about 50% of those in college age do not have the opportunity of higher education (Fergany, 1995 as cited in

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Cook, 2001). The gender gap in schooling has decreased over time but is still substantial in some countries (UNDP, 2003).

Using Egypt Demographic and Health Survey (EDHS 2000), I examine school enrollment and grade retention of Egyptian children in addition to investigating the effect of sibsize and parental education on children's education. Here, I specifically look at whether gender of the child matters in the allocation of educational resources.

LITERATURE REVIEW

A number of models addressed the relationship between family size and children's education. Assuming the prevailing type of families to be nuclear, the resource dilution model predicts decreased investment in children as sibsize increases due to the quicker depletion of finite resources – money, affection, and time. Faced with resource constraints, couples make a quality-quantity tradeoff with the optimal investment occurring in one-child families (Blake, 1989; Downey, 1995; Knodel et al., 1990; Knodel et al., 1991). A number of studies supported the resource dilution hypothesis that children's educational attainment and achievement decrease as sibsize increases even after controlling for socioeconomic status (Blake, 1981, 1989; Butcher and Case, 1994; Conley, 2000; Knodel et al., 1990; Knodel and Wongsith, 1991; Hanushek, 1992). Downey (1995) found that economic and interpersonal resources explain most of the negative association between family size and educational performance. Certain resources (e.g. economic) are more likely to be depleted by the increase in family size compared to interpersonal resources (frequency of talking with child, parent's educational expectation, and familiarity with kid's friends and their parents).

However, the negative association between family size and children's education does not seem to be universal but rather context-specific (Gomes, 1984; Lloyd and Gage-Brandon, 1994; Sudha, 1997; Truong et al., 1998). Shavit and Pierce (1991), for instance, found the association to be dependent on ethnicity. Among Israeli Ashkenazi and Oriental Jews, children's education is compromised in large families; however, family size has no such impact among Arab Muslims in Israel (Shavit and Pierce, 1991). Moreover, in Kenya families with large size fared better in terms of education than smaller- sized families (Gomes, 1984).

These contradictory findings stem from violations to the dilution model's assumption that parents bare most or even all costs of their children. This is not the case in Africa and many parts of Asia where the extended family, relatives and elder siblings assist parents in childrearing and paying for expenses (Caldwell et al., 1985 cited in Knodel et al., 1990; Gomes, 1984). The resource dilution model also ignores the role of extra-familial institutions. In a study of Malaysia, Sudha (1997) shows how external institution influences the impact of family size on children's education. Among the Malays who are the target of government's affirmative action and educational subsides, sibsize had no effect on children's education, while its impact is negative among the Chinese and Indians.

However, even in settings where large family size is not detrimental, non-negative associations between family size and children's education do not often translate into egalitarian distribution of resources. Becker (1981) argued that if the rate of return of educational investment is greater for males than females, then males would reap most of parental economic resources and get better education. This is especially the case in credit-constrained situations. Empirically, there is evidence of parental discrimination based on gender and birth order (Gomes, 1984; Parish and Willis, 1993) with girls having lower school attendance rates and higher drop outs than boys as they are forced to drop from school to attend to domestic tasks or take care of their younger siblings (Lloyd and Gage-Brandon, 1994).

However, the negative effect of family size is not unique to girls only but is of unfavorable consequences to middle born sons as well (Gomes, 1984; Lloyd and Gage-Brandon, 1994). Lillard and Willis (1994) and Parish and Willis (1993) found that the competition among siblings for resources is the strongest among same sex siblings in Malaysia and Taiwan. In other words, the more siblings of the same sex one has, the more disadvantaged the child is. Nonetheless, it seems that the education of siblings is better off in the presence of older sister rather than an older brother (Greenhalgh, 1985; Parish and Willis, 1993).

In this paper, I address the impact of family size and composition on children's schooling and educational attainment using EDHS 2000. The specific objectives of this paper are:

1. To look at how school enrollment, attainment of a school degree, and grade retention vary by age, region, parental education and gender
2. To examine whether differentials in education by family size persist after controlling for parental education and socioeconomic characteristics. Here I specifically test whether there is an interaction between family size and region (including rural/urban) on their effects on education.
3. To investigate whether there is evidence of discrimination in the allocation of educational resources in favor of sons. Here, I also test for interaction effect between gender and region.
4. To study how the likelihood of schooling, degree attainment and grade retention change as a function of the number of sibling of each sex as well as the presence of children younger than 6 years.

EDUCATION SYSTEM IN EGYPT

The educational system in Egypt is divided into pre-school (which is still rare with most of the kindergartens concentrated in urban centers), primary, preparatory, secondary, and post-secondary. Prior to 1988, primary education-which starts at age six- used to be six years until 1988 when it was reduced to five years to be restored back to six years in 1999. Preparatory education consists of three years. In 1981, both primary and preparatory were incorporated into basic/compulsory education which is also free.

Secondary education comprises general secondary, technical secondary, and vocational secondary. They range between three and five years (UNESCO, 2003).
In addition to this state run education system (private schools is incorporated within this system), there is also Al-Azhar (another parallel system) which is a religious school system that functions independently from the ministry of education. The Al-Azhar schools have primary, preparatory and secondary education; however, it places more emphases on religious education than the state system. In 2000, the Al-Azhar schools accounted only for less than 4% of total enrolled students (Cook, 2001).

DATA AND METHODS

Sample

The EDHS (2000) is a nationally representative survey of ever-married Egyptian women aged 15-49. The survey is the fourth after the 1988, 1992, and 1995 surveys. A total of 15,573 ever-married women were interviewed out of 15,649 women selected for the survey (El-Zanaty and Way, 2001). EDHS 2000, like other DHS surveys have a household file with questions on the household condition and members who are resident in the household. The woman's questionnaire collects information on respondent's background, marriage, fertility and family planning, breastfeeding and husband's background. For this paper, I use both the household and ever-married women files.

The 2000 Egypt DHS interviewed 16, 956 households. In the data analyses, 91 households (all headed by men) were excluded because more than one woman reported to be wife of head of household and only household members who were identified as sons/daughters to the head were kept in the analyses. Moreover, the age range was restricted to 3-25 years. Although formal schooling does not start until age 6, children aged 3-6 years were included in the analyses in order to allow some analyses on early education and whether it differs by gender and region.

There are 12,238 households that include sons/daughters between ages of 3 and 25 years. The household structure in Egypt is complex with about 62% of households consisting of three or more related adults and only 34.84% are nuclear family households.
Less than 9% of households are headed by women of whom the overwhelming majority (79.03%) is widows. As a result, 8.67% of households have an absent father (who either is dead or not residing with the family); 1.43% of households do not have a residing mother/step mother and almost 90% of households have both parents present (although the mother-figure could be either biological mother or step-mother). It is possible to determine whether the child in the household is the wife of the head own child or a step-child only for children under the age of 14 years. My preliminary analyses (results not shown here) reveal that the percentage of step-children among those aged 14 years and younger is very small.

In the sample, fathers are, on average, aged 46 years --- about seven years older than mothers. Parental educational attainment is modest. It is less than 7 years of schooling for fathers and about 5 for mothers. A substantial number of parents are

illiterate. About 47% of mothers had no formal schooling compared to around 33% among fathers.

Measures

The outcome measures in this paper are: a) school enrollment, a dummy variable in which the respondent is asked whether the child is currently attending school; b) school degree attainment, a dummy variable that indicates whether the child (depending on his/her age) got a primary or secondary degree; and c) grade retention. The survey does not have a specific question on whether the child has repeated a grade; however, I constructed a grade-for age- measure (for those currently enrolled in school) that compares the actual grade of the child to that expected based on the child's age and allowing for one extra year. The measure has four categories describing educational efficiency of the child: ahead, just right, one year behind, and two years and more behind. For family size and composition, the paper uses the following variables: number of brothers in the household, number of sisters in the household, number of brothers living away, number of sisters living away, and a dummy variable for the presence of a child younger than 6 years.

Analyses

To examine the impact of family size and composition on educational outcome, I use logistic regression with school enrollment and degree attainment as dependent variables as well as ordered logit model when grade retention is the outcome of interest.
The techniques estimate the log odds of the occurrence of each of the three measures. The sample is stratified into the following age groups: 7-13; 14-16; 17-19; 20-25 and the analyses are run separate for each age group. School enrollment and grade retention are used for the age groups 7-13, 14-16, and 17-19 while degree attainment is used only for age groups 17-19 and 20-25. Huber-White adjusted standard errors are to be applied in the analyses to correct for potential bias induced by the presence of more than one sibling in the same model. Each of the regressions include family size and composition measures, gender of the child, age (continuous), parental education, mother's working status, region of residence, economic status of the family (constructed from indicators of household condition), and interaction terms.

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