

Gender, Sibship Composition and Education in Egypt

Rania Tfaily

Department of Sociology and Anthropology, Carleton University

rania_tfaily@carleton.ca

Abstract

This article examines the relationship between gender, sibship and education over time in Egypt. It focuses on how the number, sex and birth order configuration of siblings affected boys' and girls' education during 1991-2008, a period characterized by significant social and economic changes in Egypt. This study disaggregates schooling into conditional grade progression ratios and uses sibship measures that are age/grade specific. The analyses show that family composition shaped differently the educational opportunities of boys and girls. The number of siblings had a negative and significant effect on various grade transitions, and its effect was consistently stronger for girls. Both boys and girls were disadvantaged the more brothers they had; however, the number of brothers – particularly younger brothers – mattered more in the case of girls. The significant effect of sibship extended into higher school grades, and its impact was often stronger for more recent cohorts.

Introduction

There is extensive interest in the impact of family characteristics on education. This is not surprising given that disparities in family background are related to educational inequality and broader patterns of stratification in society. Numerous studies stressed that family structure – such as the number of siblings – played an important role in shaping educational outcomes.¹ Blake (1989) and Li et al. (2008) found that having many siblings negatively affected one's educational attainment even after controlling for parental characteristics. The impact of sibsize² was substantial and on par with parents' socioeconomic status.³

Much of the literature, however, focused on the effect of the number of siblings and overlooked other characteristics such as the sex and birth order configuration of siblings. Few studies investigated whether (and how) the impact of sibship composition varied as a function of the child's gender. In addition, studies generally analyzed "single status" indicators of education (such as years of education or current school attendance) and used incongruent measures of sibship. While the literature on the relationship between family structure and education in developing countries expanded over the past two decades, there is very limited research on educational stratification in Arab countries, and the region is excluded in review articles on the topic (Buchmann and Hannum 2001).

This article examines how the number, sex and birth order configuration of siblings affected Egyptian children's various grade progression ratios – which measure whether or not a child attended a particular grade conditional on having completed the previous grade.⁴ These conditional grade progression ratios were calculated for grades one to nine. The article also tests whether the effects of sibship differed by the child's gender and by educational level (primary level versus preparatory level).⁵ It focuses on enrollment of school-aged children (8-17 years)

¹ For example, Blake (1981, 1989); Steelman and Powell (1989); Knodel and Wongsith (1991); Shavit and Pierce (1991); Parish and Willis (1993); Powell and Steelman (1993); Lloyd and Gage-Brandon (1994); Downey (1995); Pong (1997); Wolter and Veliacott (2003); Eloundou-Enyegue and Williams (2006); Yu and Su (2006); Park (2008); Rammohan and Dancer (2008); Xu (2008).

² Sibsize refers to the number of siblings that a person has. Sibsize and the number of siblings are used interchangeably in this article.

³ See Blake (1981); Mare and Tzeng (1989); Steelman and Powell (1989); Powell and Steelman (1993).

⁴ The conditional grade progression ratios used in this article measure attendance at various grades rather than school performance.

⁵ Primary education – which starts at age six – consists of grades one to six. Preparatory education consists of grades seven to nine.

during 1991-2008, a period characterized by significant social and economic changes in Egypt. I address four specific research questions: was the impact of the number of siblings on various grade transitions the same for boys and girls? Did the sex and birth order configuration of siblings matter? Stated differently, how did the number of older brothers affect various grade transitions compared to that of older sisters or younger brothers? Similarly, did the number of younger sisters have the same impact on grade progressions as that of older sisters or younger brothers? Third, did the effects of the number and composition of siblings become weaker at higher grade transitions? Finally, was the impact of sibship on conditional grade progression ratios larger for more recent cohorts?

Egypt witnessed dramatic economic restructuring and changes in the last few decades. These changes eliminated guaranteed employment in the public sector for secondary and post-secondary graduates, reduced trade barriers, decreased subsidies and increased privatization (Hoodfar 1997a; Adam 2000; Amin and Al-Bassusi 2004). While the education system expanded and the gender gap in education narrowed (Lloyd et al. 2003), the increase in enrollment was achieved at the expense of quality (Birdsall and O'Connell 1999, 6). The low quality of education and high retention rates propelled parents to resort to private tutoring to support their children's education (Elbadawy et al. 2009; Assaad et al. 2010). This led to considerable financial strain and aggravated poor school performance especially among those whose parents could not afford private tutoring (Megahed 2008). Egypt's socioeconomic and cultural changes also had significant effects on the family and gender relations (Hoodfar 1997b). The impact of these changes on women was mixed; while women's education and age at first marriage increased, labor force participation remained low (Amin and Al-Bassusi 2004).

This article proceeds as follows. I first review the literature on sibship and education and gender and education. I next discuss the significance of my research, outline Egypt's social and economic context, and provide an overview of the data and methods. After presenting the results, I discuss the findings of the study and its contribution to the literature.

Background

Sibship and Education

There is consistent evidence based on data from Western industrialized countries that the number of siblings had a strong negative impact on academic performance and educational attainment even after controlling for parental characteristics and socioeconomic status. Having many siblings reduced verbal and mathematics test scores (Downey 1995), grade-point average (Powell and Steelman 1990), grade progression and private school enrollment (Conley and Glauber 2006), high school graduation (Blake 1989) and educational attainment (Shavit and Pierce 1991). These effects persisted even in countries with generous family welfare programs and free compulsory education (Wolter and Veliacott 2003; Park 2008; Xu 2008).

While the negative impact of the number of siblings on educational outcomes in the U.S. and Western Europe is largely indisputable (Steeleman et al 2002), evidence from developing countries is less definite. Studies in Kenya, rural Botswana and Vietnam found that sibsize had positive or no effect on children's education.⁶ In contrast, having many siblings decreased secondary school enrollment in Thailand (Knodel and Wongsith 1991), reduced educational attainment in Malaysia (Lillard and Willis 1994; Pong 1997) and increased school drop-out for girls in Ghana (Lloyd and Gage-Brandon 1994). Recent studies showed that the negative relationship between sibsize and education emerged over the course of development in Cameroon, Bangladesh, China, Indonesia and Brazil.⁷ As the value of education increased, the inverse effect of the number of siblings on educational outcomes became more pronounced over time.

Studies generally relied on the resource dilution model to explain why sibsize reduced academic achievement and educational attainment. The model postulated that having many siblings diluted parental resources and reduced one's educational outcomes (Blake 1981). Downey (1995) showed that many key parental resources – such as money and adult-child interactions – decreased as the number of siblings increased controlling for other factors. Downey also found that parents' economic and interpersonal resources explained most of the negative effects of sibsize on children's verbal and mathematics test scores and overall grades.

⁶ Gomes (1984); Chernichovsky (1985); Anh et al. (1998); Buchmann (2000).

⁷ See Eloundou-Enyegue and Williams (2006); Razzaque et al. (2007); Lu and Treiman (2008); Maralani (2008); Marteleto and de Souza (2012).

While the literature on sibship and education is extensive, it largely focused on the number of siblings. Few studies looked at the effects of the number of brothers and the number of sisters and even fewer took the sex and birth order composition of siblings into account.⁸ Previous studies also reached different conclusions regarding the impact of the sex composition of siblings on educational attainment. The findings – generally based on U.S. data – were so diverse that they almost covered the whole spectrum.⁹ Using data from Taiwan and Malaysia, Parish and Willis (1993) and Lillard and Willis (1994) found that competition for resources was strongest among same-sex siblings, and that the number of opposite-sex siblings had no effect on completed years of education.

Gender and Education

Notwithstanding the contradictory findings of the literature, the sex and birth order of siblings could affect children's educational attainment due to a number of factors. This is particularly the case in countries (such as Egypt) where parents lack old age security and rely on their adult children for support. In such context, schooling is viewed as an economic decision with parents investing in the child or children showing the most promise in maximizing the family's economic returns (Buchmann and Hannum 2001; Stash and Hannum 2001). It is assumed that when resources are limited, parents engage in differential allocation of resources depending on the returns they expect from educating the child and the opportunity cost of keeping him/her in school (Gomes 1984; Lloyd and Gage-Brandon 1994). A child's gender is featured prominently in such decision-making processes (Buchmann 2000; Yu and Su 2006). Becker (1981) argued that if the rate of return to educational investment is greater for men than women, then sons will reap most of the parental economic resources and get better education.

Cultural customs regarding gender roles are also important factors. Girls in many settings generally have domestic and child caring duties which increase the opportunity cost of sending them to school (Lloyd and Gage-Brandon 1994; Post 2001). Having many siblings tends to increase the non-paid domestic work load for girls and reduces their education (Rose and Al-Samarrai 2001). In addition, women often leave their natal families upon marriage, while it is the

⁸ For an exception, see Parish and Willis (1993); Lillard and Willis (1994); Post and Pong (1998).

⁹ Powell and Steelman (1989); Butcher and Case (1994); Kasenter (1997); Hauser and Kuo (1998); Conley (2000).

norm for married sons in patrilineal societies to live with or in close proximity to their parents and support them in old age. Such norms and expectations often lead parents to reduce their investment in their daughters' education. For instance, girls in China were much more likely to be penalized and taken out of school for poor school performance than boys (Zhang et al. 2007), and they were particularly vulnerable in low-income households (Wang 2005). Similarly, Dancer and Rammohan (2007) found that the gender gap in schooling was particularly large among the poor in Egypt.

Attitudes towards girls' education in Arab countries changed dramatically over the past several decades. Education was initially viewed as unnecessary for girls and even damaging to their morals and dedication to domestic duties (Adley 2004). Since the 1950s, women's education became part of the modernization project of many Arab countries which experienced anti-colonial revolutions inspired by socialist ideals. However, some Arab countries such as Egypt still face a persistent gender gap in schooling even at the primary level (Dancer and Rammohan 2007; Assaad et al. 2010, 80-81).

Two main factors differentiated Arab women's educational experience from that of men's. First, girls spent disproportionately large number of hours doing domestic chores and taking care of their younger siblings on a daily basis. These chores were numerous and very time-consuming especially in poor households that lacked in-door plumbing and/or labor-saving appliances. Assaad et al. (2010) showed that Egyptian girls' domestic work strongly interfered with their education and led to lower school enrollment. Second, many parents perceived women's education merely as a prerequisite for good marriage (Amin and Bassusi 2004) and/or as a symbol of prestige and status (Jansen 2006). Parents were often supportive of their daughters' education; however, they tended to oppose their labor force participation (Jansen 2006). In contrast, it was inconceivable for parents to educate their sons without expecting them to work. There is evidence that families were more likely to allocate educational resources in favor of sons. For example, Jansen (2006) and Buckner (2013) showed that women in Jordan and Egypt were underrepresented in private universities that charge tuition, while they outnumbered men in state-funded public universities.

Significance of the Research

This article extends research on sibship and education to Arab countries (Egypt) and addresses a number of limitations in the literature. Previous studies focused primarily on sibsize and implicitly assumed that the impact of the number of siblings on schooling was the same for boys and girls. Both the focus and the assumption are problematic in settings characterized by constrained economic resources and patriarchal gender norms. Few studies – particularly in developing countries – looked at how the sex and birth order configuration of siblings affected educational attainment. In addition, studies generally looked at the impact of sibship on “current school attendance” or “years of schooling”. Such statistical models assumed that education is a “single status” measure rather than “a sequence of events in time” (Mare 2006, 27). Previous research also relied on one-time measures of sibship and ignored the fact that the number and characteristics of siblings are usually not constant over the trajectory of one’s education especially in relatively high fertility countries.

In this article, I examine the impact of sibship size and composition on schooling for Egyptian boys and girls aged 8-17 years during 1991-2008. I look at whether the impact of the number of siblings differed by the child’s gender. I also decompose sibsize to take into account the sex and birth order configuration of siblings. I specifically look at the impact of the number of older brothers, the number of older sisters, the number of younger brothers and the number of younger sisters. Following the approach of Mare (1980, 295), I disaggregate schooling “into a series of grade transitions”. This approach is a much better alternative than using ‘years of education’ for two reasons. First, ‘years of education’ tends to suffer from age-related right censorship when the survey includes children who have not yet completed their formal schooling. Second, the use of grade transition makes it possible to look at the impact of sibship at various educational levels rather than just its cumulative effect on completed years of schooling (Mare 1980). Unlike most previous studies, sibship measures are not assumed to be constant over time; rather they are age/ grade specific.

The Context

Egypt is the most populous Arab country with an estimated population of 82.3 million in 2012 (Population Reference Bureau, 2012). It experienced significant demographic, economic,

social and cultural changes over the last several decades. Fertility declined from 5.3 children per woman in 1980 to 2.9 in 2012 (United Nations 2002; Population Reference Bureau 2012). The monarchy was overthrown in 1952, and a republic with a state-led economy was established. The state introduced a number of measures to reduce class inequalities such as free and universal education, food subsidies, rent control, free health care and guaranteed employment for secondary and post-secondary graduates (Hoodfar 1997a, 43). Government expenditures on public education increased, and the education system expanded (Birdsall and O'Connell 1999).

Since the mid 1970s, the socialist agenda of the revolution was slowly replaced by pro-market economic policies. The government suspended the guaranteed employment scheme in 1990 (Birdsall and O'Connell 1999). A year later, it embarked on a structural adjustment program that was backed by the International Monetary Fund and the World Bank (Hoodfar 1997a). The structural adjustment program aimed at decreasing state involvement in the economy, reducing social services, facilitating privatization, lowering trade barriers and increasing foreign investment (Adams 2000). Egypt's economic woes, however, continued to mount. In addition, high fertility rates in past decades coupled with massive migration from rural areas to cities put enormous pressure on urban infrastructure and social services (Moghadam 2008). Unemployment and poverty rates increased, standard of living declined, and social unrest and labor protests accelerated (Hoodfar 1997a; Adams 2000; Moghadam 2008). They culminated with the fall of President Mubarak in 2011. President Morsi was similarly ousted in 2013 due to massive demonstrations which were galvanized at least in part by gas shortages and rapid deterioration of the Egyptian currency and standard of living.

Over the last few decades, as Egypt's GDP stagnated, expenditure per student declined and the quality of education diminished (Hoodfar 1997a; Birdsall and O'Connell 1999). Public spending on education decreased from 5.7% of GDP in 1985 to 4.7% in 2003 (Yount and Rashad 2008), while the number of school-aged children increased due to past high fertility levels. In addition, the government allocated significant amounts of resources to tertiary education at the expense of primary and preparatory levels (Richards and Waterbury 1996). The physical structure of schools deteriorated, classes became more crowded and teachers' compensation and morale declined. Faced with dramatic increases in retention rates, parents often resorted to private tutoring to help their children pass school exams. The costs of education increased for all

social groups, and it became particularly high for the poor in rural areas (Birdsall and O'Connell 1999). Children often dropped out of school or never attended to help their parents in their work or because of the relatively high expenses and opportunity costs of educating all children (Adams 2000).

Data and Methods

The article uses data from the 2000, 2005 and 2008 Egypt Demographic and Health Surveys (EDHS). These nationally representative surveys were conducted under the supervision of the Egyptian Ministry of Health and Population and the National Population Council (see El-Zanaty and Way 2001, 2006, 2009 for detailed information about sample selection). The surveys included a household questionnaire and a woman's questionnaire. The household questionnaire collected demographic and socioeconomic information about each household member such as relationship to household head, age, sex, educational attainment, current school attendance and work status. The woman's questionnaire collected detailed information about the reproductive history of ever-married women aged 15-49 years in the sampled households. Women were asked about the birth order, date of birth, sex, date of death (if applicable) of each of their children. Each of the women's biological children – regardless of where he/she lived – had a record in the ever-married women file.

I merged information from the household file with that of the ever-married women file to get data about children's educational attainment and to calculate the number, sex and birth order composition of siblings. The dependent variables are grade progression ratios that are conditional on passing the previous grade. Egyptian children are usually in grade one by age six and in grade nine by age fourteen. To take into account delayed school enrollment and to ensure that grade repetition was not confounded with school drop-out, the analyses allow for three extra years such that students are expected to be in grade two by age ten and in grade nine by age seventeen.

While the data are rich with demographic information, they do not contain information about the educational attainment of children who were not household residents. This is an issue mainly for older cohorts, especially daughters. To minimize the impact of the exclusion of non-resident children, the analysis is restricted to birth cohorts in which the overwhelming majority of their members still resided in the parental household. Cohorts with over 10% of their female

members residing elsewhere are not included in the analysis. As a result, boys and girls born before 1991 are not included in the 2008 data analysis. The cut-off birth years are 1988 for the survey year 2005 and 1983 for the survey year 2000. Given the age constraints and taking into account grade repetition, grade progression ratios are calculated up to grade nine. This study uses the same birth cohorts for boys and girls to ensure that the results for boys and girls are comparable. The sample size is 53,138 children born between 1983 and 1999.

The article uses logistic regression to examine the impact of sibship on conditional grade progression ratios. The grade progression ratios variables are calculated from grade one to grade nine. They are coded one if the child attended grade x conditional on having successfully completed the previous grade and zero if he/she didn't. To illustrate, let's assume that the highest grade attended by a fifteen year old girl is five.¹⁰ This girl would be coded one in calculating progression ratios of grades one to five, while she would be coded zero in estimating progression to grade six as she didn't attend grade six even though she passed the previous grade. She would not be included in the model for grade seven as she did not complete the previous grade (grade six in this case). Generally-speaking, the logistic regression model for first grade includes all children in the dataset, while the model for sixth grade includes all children who completed at least five years of education (assuming that they met the age requirement). All models use Hubert-White robust standard errors.

The main independent variables are sibship measures which include: a) the number of siblings and child's birth order; b) the number of brothers and the number of sisters; and c) the number of older brothers, the number of older sisters, the number of younger brothers, and the number of younger sisters. The analyses for each of the grade progression measures are run with and without controls for parents' demographic and socioeconomic characteristics. This is to test whether sibship had a direct effect on conditional grade progression ratios net of other factors. The control variables¹¹ are: father's years of education; mother's years of education; mother's age at first marriage; and mother's age at child's birth (varies from one child to another in the family). Data from the three surveys are combined; however, the analysis controls for birth

¹⁰ Given that the analyses allow for three extra years to take into account delayed school enrollment and grade repetition, this fifteen year old girl would have been expected to have attended at least grade seven if that she had not dropped-out of school.

¹¹ It is not possible to control for other socioeconomic variables as the data lack retrospective measures of household income or wealth.

cohort and adjusts for clustering of more than one observation per household (e.g. in the case of siblings). The analyses are stratified by gender.

The following equation represents the logistic regression model for k explanatory variables and $i = 1, 2, \dots, n$ individuals. p_i is the probability that the dependent variable y_i is equal to 1.

$$\text{Ln}\left[\frac{p_i}{1 - p_i}\right] = \alpha + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_k x_{ik} \quad (1.1)$$

The regression coefficients are interpreted in terms of adjusted odds ratios (i.e. odds ratios controlling for other variables). A 0.69 odds ratios of sibsize means that the odds of grade progression ratio for grade x decreased by 31% for every additional sibling that a child had. Odds ratios greater than one indicates that the explanatory variable has a positive effect on grade progression ratios, while an odds ratios less than 1 indicates a negative relationship between the independent variable and grade progression ratios.

RESULTS

The Impact of the Number of Siblings on Conditional Grade Progression Ratios

Figure 1 shows the impact of sibsize on education by gender controlling¹² for birth year (cohorts 1983-1999). Sibsize had a consistently negative and statistically significant effect on conditional grade progression ratios for both boys and girls. The effect of sibsize was particularly strong on school ever-enrollment: the odds ratios of attending first grade decreased by 31% for every additional sibling for girls and by 23% for each additional sibling for boys. Conditional on having successfully completed the previous grade, the impact of sibsize was negative and statistically significant at various grades at the primary (grades 1-6) and preparatory levels (grades 7-9). The conditional odds ratios of attending grade seven decreased by 27% for girls and by 19% for boys for every additional sibling. The impact of sibsize on conditional progression to grade seven was generally higher than that of other grades (with the exception of grade one) especially for girls. This is likely because grade seven – which indicates the successful

¹² I also controlled for birth order in separate analyses. However, it did not have a statistically significant effect and was excluded from the regression analyses in figure 1.

completion of primary education and the beginning of the preparatory level – represents an important transition in Egypt’s education system. Figure 1 also shows that the impact of sibsize on conditional grade progression ratios was stronger for girls than boys at every grade (with the exception of progression to grade two). The gender gap in the effect of sibsize was the greatest for grades one and seven which represent the commencement of the primary and preparatory educational levels respectively.

I replicate the regression analyses of figure 1 and include interaction terms between sibsize and birth year to specifically test whether the effect of sibsize on education changed over time (results available upon request). The negative impact of sibsize did not decrease for more recent cohorts. The interaction terms between sibsize and birth year were generally negative indicating that the effects of sibsize were larger (and more negative) for younger birth cohorts. The interaction terms were statistically significant in cases of progression to grades one, four and six for boys and grades one and five for girls. This suggests that the negative effect of the number of siblings became more pronounced for more recent cohorts. As discussed previously, the quality of education declined and retention rates increased as Egypt’s economic conditions deteriorated. Private tutoring became crucial to pass school exams, and the costs of education increased particularly for families with many children (Birdsall and O’Connell 1999; Elbadaway et al. 2009).

The Impact of the Number of Brothers and the Number of Sisters

Figures 2a and 2b show the impact of the number and sex composition of siblings on grade progression ratios for boys and girls respectively. The logistic regression models include the number of brothers and the number of sisters as the main explanatory variables and control for birth year (cohorts 1983-1999). The results show that the odds ratios of attending grade x conditional on having completed the previous grade decreased with every additional brother and/or sister. The effects were statistically significant across all grades and for boys and girls (with the partial exception of progression to grade three for boys). The results also show that the negative impact of the number of brothers on school progression was consistently stronger than that of the number of sisters (with the exception of progression to grade three for girls). Children of both genders were less likely to successfully complete various grades the more brothers –

rather than sisters – they had. This suggests that parents were more likely to allocate resources in favor of sons than daughters.

I also test whether the impact of the number of brothers and the number of sisters varied by birth cohort. The interaction terms were generally insignificant with few exceptions in which the negative effects of the number of brothers and the number of sisters were stronger (and statistically significant) for more recent cohorts (results available upon request).

The Impact of the Sex and Birth Order Configuration of Siblings

The top panel in table 1 shows the impact of the number, sex and birth order composition of siblings on conditional grade progression ratios controlling for birth year (cohorts 1983-1999) for boys. The number of older brothers and the number of younger brothers had consistently negative and statistically significant effects across different grade progressions (with the sole exception of progression to grade two in the case of the number of younger brothers). The impact of the number of older sisters and the number of younger sisters were also negative and often statistically significant; however, the negative effect of the number of older brothers was stronger than that of the number of older sisters; similarly, the negative impact of the number of younger brothers was stronger than that of the number of younger sisters. The effect of the number of older sisters was usually the weakest among the four sibship variables. The results indicate that boys with many siblings were less likely to progress to the next grade, and that the impact of sibship was stronger the more brothers the boy had and smaller in the case of older sisters.

The bottom panel in table 1 shows the impact of the number, sex and birth order composition of siblings on conditional grade progression ratios controlling for birth year (cohorts 1983-1999) for girls. The four variables – the number of older brothers, the number of older sisters, the number of younger brothers and the number of younger sisters – also had consistently and statistically significant negative effects on girls' progression across various grades (with the exception of progression to grade three in the case of the number of older brothers; progression to grade five in the case of the number of older sisters; and progression to grades two and four in the case of the number of younger sisters). As in the case for boys, the impact of the number of older brothers was generally stronger than that of the number of older sisters (with the exception of progression to grades two, three and four). The impact of the

number of younger brothers was consistently stronger than that of the number of younger sisters across all grade progressions. Of the four explanatory variables, the number of younger brothers had the strongest impact on girls' education except in the case of progression to grade seven in which the effect of the number of older brothers was greater. The results indicate that girls' education was disadvantaged the more brothers – especially younger brothers – they had.

The Impact of Sibship Controlling for Parental Characteristics

The results so far show that sibship had strong negative impact on education. Next I look at whether these effects persisted after controlling for parental characteristics. Figures 3, 4a and 4b and table 2 replicate the analyses presented in the previous sections and control for father's years of education, mother's years of education, mother's age at first marriage and mother's age at the birth of the child. The results indicate that sibship had a direct negative effect on educational attainment net of controls.

Figure 3 shows that while the odds ratios slightly decreased after controlling for parental characteristics, sibsize still exerted significant negative impact on conditional grade progression ratios (with the exception of grades two and three for boys and girls and grades 8 and 9 for boys only). The negative impact of the number of siblings on education was also stronger for girls than boys. The gender gap in the effect of sibsize was large at grade one, became minimal or non-existent at grades two to four, and increased and widened at higher grades.

Figures 4a and 4b look at the effects of the number of brothers and the number of sisters on grade progression ratios for boys and girls controlling for parental characteristics. The results show that the negative impact of the number of brothers was consistently stronger than that of the number of sisters (except at grade four for boys and grade three for girls). While the number of brothers reduced grade progression for both boys and girls, the number of sisters mattered only for girls. Having many brothers reduced boys' successful completion of all grades (except for grades two and nine), while the number of sisters had no statistically significant effect (except at grade four). Similarly, the number of brothers had a strong negative impact on girls' various grade progressions (except for grades two and three), while the number of sisters mattered specifically at three transitional grades: grade one (measures ever-enrollment in

school); grade seven (denotes the beginning of the preparatory level) and grade nine (signals the completion of preparatory education).

I next test how the number and sex and birth order composition of siblings affected conditional grade progression ratios controlling for parental characteristics. Table 2 shows the results for boys (top panel) and girls (bottom panel). The negative effects of the number of older brothers on boys' educational attainment were confined to primary education. The number of older brothers reduced grade progressions to grades one, three, four and five, but did not have statistically significant impact on the preparatory level. In contrast, the number of younger brothers continued to matter at higher grades. It specifically decreased successful completion of grades one, four, six, seven and eight. As in figure 4a, the number of older sisters had no significant effect on boys' educational attainment (except at grade four), while the number of younger sisters reduced progression to grades one, four and seven.

The pattern of the impact of the number and sex and birth order configuration of siblings was different for girls. Unlike the case for boys, the number of older brothers reduced the likelihood of ever school enrollment (first grade) as well as the successful completion of primary education and each of the grades at the preparatory level. The negative effects of the number of younger brothers were substantial and generally the strongest of all sibling variables. Having younger brothers reduced girls' successful completion of all grades (except for second grade). Even the number of older sisters seemed to matter although to a much less extent than the number of older brothers. Older sisters reduced the likelihood that girls would ever enroll in school (i.e. attending first grade) and/or progress beyond primary education (i.e. attending seventh grade). In addition to these two grades, the number of younger sisters significantly reduced progressions to grades five and nine.

Discussion

This article examines how the effects of gender and sibship configuration shaped the education of Egyptian boys and girls (aged 8-17 years) during 1991-2008, a period characterized by economic recessions, reductions in social welfare, increased privatization, declines in standard of living and deteriorating quality of education. The analyses show that the number of siblings had a negative effect on conditional grade progression ratios, and that its impact was

stronger for girls than boys. These results suggest that parents were more likely to squeeze their resources to send sons to school, while they were less likely to do so for girls. The sex and birth order configuration of siblings was also important in shaping children's educational opportunities. The negative impact of the number of brothers was consistently stronger than that of the number of sisters. This suggests that sons were more likely to dilute parental resources than daughters. The impact of the number of brothers – particularly younger brothers – was especially pronounced in the case of girls' education. Family composition continued to matter even at higher grade transitions. The negative effects of sibship variables had to some extent become stronger over time.

This study extends the literature on family characteristics and educational inequality to Arab countries (specifically Egypt). It shows that the number, sex and birth order configuration of siblings mattered at various grades and should be considered in studies on the impact of family structure on education in developing countries. The article provides evidence of parents' differential allocation of resources based on the child's gender and birth order. While the results support the notion that parental resources are diluted the more siblings they have, the resource dilution model has two main limitations. First, it does not take into account the impact of the number of siblings on children's own resources (e.g. time). Having many siblings not only diluted parental resources, but it also reduced the time that older siblings – particularly girls – could devote for school or other developmental activities. Having many younger siblings substantially increased girls' domestic work load and child-caring duties (Assaad et al. 2010) and altered the opportunity cost of sending them to school. The second limitation is that the model implicitly assumes that children would be equally affected by the dilution of resources. This does not seem to be the case. The results indicate that the impact of the number of siblings was stronger for girls, and that parents were more likely to transfer resources away from eldest daughters in favor of sons. Controlling for parents' education and demographic characteristics, the number of older sisters was inconsequential to boys' various grade progression (except for grade four), while the number of older and younger brothers had adverse effects. In addition, the negative impact of the number of younger brothers on girls' education was consistently stronger than that of the number of younger sisters. This is despite the fact that younger brothers and younger sisters presumably make the same demands on an eldest sister's time.

The study findings are due to three related factors. First, parents in Egypt were increasingly paying substantial out of pocket education-related expenses. The deterioration in the quality of education and the increase in retention rates over the last few decades compelled a significant percentage of parents to self-finance private tutoring for their children (Birdsall and O'Connell 1999). The percentage of students taking private lessons was 45% at the primary level and 60% at the preparatory level, and private tutoring consumed a significant percentage of household budget (Elbadaway et al. 2009). These trends along with inflation and declines in the standard of living exacerbated pressure on Egyptian families especially those with a large number of children.

Second, returns to education were not high in Egypt particularly after secondary and post-secondary graduates were no longer guaranteed employment in the public sector which is the largest employer (Birdsall and O'Connell 1999; Hoodfar 1997a). They were even lower for women. In Egypt as in many other countries, men had better employment chances and higher wages than women. The state allocated considerable resources to domains that benefit men such as vocational training (Hoodfar 1997a). Women's paid work was strongly contested and perceived to be incompatible with married life (Amin and Al-Bassusi 2004). The prospects of labor force participation for women were relatively low, and unemployment rate among university graduates – especially women – was high (Birdsall and O'Connell 1999; Moghadam 2008).

Third, Egyptian boys and girls were socialized to fulfill traditional gender norms (Lloyd et al. 2003), and sons were expected to provide financial support for their elderly parents – particularly mothers who tended to outlive their husbands. Not surprisingly, Hoodfar (1997a) found that the desire for sons was stronger among Egyptian women than men. While there is some evidence that gender roles were being negotiated in Egypt (Hoodfar 1997b), the dominant discourse continued to emphasize women's roles as wives and mothers. Over 90% of boys and girls aged between 10 and 19 years believed that domestic work was the sole responsibility of women, and the majority opposed women's labor force participation (Mensch et al. 2003). The opportunity cost of sending girls to school was relatively high in Egypt as daughters generally had domestic and child-caring duties, and their work load increased substantially with age (Assaad et al. 2010, 89).

Although gender roles played an important role in shaping girls' education, such ideologies are not necessarily fixed. The structure of patriarchy had been changing in Egypt over the past few decades (Moghadam 2004), and public acceptance of women's education increased dramatically. Women had become notably visible and vocal in the public sphere, and it was widely acknowledged that they played an important role in Egypt's 2011 revolution. As Egyptian women make crucial inroads into the labor force, their returns on education would be expected to increase. The opportunity cost of keeping girls in school would also likely decrease as fertility and the number of siblings decline further. At the same time, girls are still being socialized to fulfill nurturing roles (Lloyd et al. 2003), and Egyptian women often retain strong ties with their parents even after marriage (Yount 2005). In light of this, it is likely that parents would invest more in their daughters' education, and that they would start to rely more on them for old age support in the near future.

ACKNOWLEDGMENTS

REFERENCES

- Adams, Richard H., Jr. 2000. "Evaluating the Process of Development in Egypt, 1980-97." *International Journal of Middle East Studies* 32: 255–75.
- Adely, Fida. 2004. "The Mixed Effects of Schooling for High School Girls in Jordan: The Case of Tel Yahya." *Comparative Education Review* 48 (4): 353–73.
- Amin, Sajeda, and Nagah H. Al-Bassusi 2004. "Education, Wage Work, and Marriage: Perspectives of Egyptian Working Women." *Journal of Marriage and Family* 66 (December): 1287–99.
- Anh, Truong S., John Knodel, David Lam, and Jed Friedman. 1998. "Family Size and Children's Education in Vietnam." *Demography* 35 (1): 57–70.
- Assaad, Ragui, Deborah Levison, and Nadia Zibani. 2010. "The Effect of Domestic Work on Girls' Schooling: Evidence from Egypt." *Feminist Economics* 16 (1): 79–128.
- Becker, Gary. 1981. *A Treatise on the Family*. Cambridge, MA: Harvard University Press.
- Birdsall, Nancy, and Lesley O'Connell. 1999. "Putting Education to Work in Egypt." Paper presented at the conference *Growth Beyond Stabilization: The Prospects for Egypt*, February 3-4, Cairo, Egypt.

- Blake, Judith. 1981. "Family Size and the Quality of Children." *Demography* 18 (4): 421–42.
- Blake, Judith. 1989. "Number of Siblings and Educational Attainment." *Science* 245 (4913): 32–6.
- Buchmann, Claudia. 2000. "Family Structure, Parental Perceptions, and Child Labor in Kenya: What Factors Determine Who Is Enrolled in School?" *Social Forces* 78 (4): 1349–79.
- Buchmann, Claudia, and Emily Hannum. 2001. "Education and Stratification in Developing Countries: A Review of Theories and Research." *Annual Review of Sociology* 27: 77–102.
- Buckner, Elizabeth. 2013. "Access to Higher Education in Egypt: Examining Trends by University Sector." *Comparative Education Review* 57 (3): 527–52.
- Butcher, Kristin F., and Anne Case. 1994. "The Effect of Sibling Sex Composition on Women's Education and Earnings." *The Quarterly Journal of Economics* 109 (3): 531–63.
- Chernichovsky, Dov. 1985. "Socioeconomic and Demographic Aspects of School Enrollment and Attendance in Rural Botswana." *Economic Development and Cultural Change* 33 (2): 319–32.
- Conley, Dalton. 2000. "Sibship Sex Composition: Effects on Educational Attainment." *Social Science Research* 29: 441–57.
- Conley, Dalton, and Rebecca Glauber. 2006. "Parental Educational Investment and Children's Academic Risk: Estimates of the Impact of Sibship Size and Birth Order from Exogenous Variation in Fertility." *The Journal of Human Resources* 41 (4): 722–37.
- Dancer, Diane, and Anu Rammohan. 2007. "Determinants of Schooling in Egypt: The Role of Gender and Rural/Urban Residence." *Oxford Development Studies* 35 (2): 171–95.
- Downey, Douglas B. 1995. "When Bigger Is not Better: Family Size, Parental Resources, and Children's Educational Performance." *American Sociological Review* 60 (5): 746–61.
- Downey, Douglas B. 2001. "Number of Siblings and Intellectual Development: The Resource Dilution Explanation." *American Psychologist* 56 (6/7): 497–504.
- Elbadawy, Asmaa, Dennis Ahlburg, Ragui Assad, and Deborah Levison. 2009. "Private and Group Tutoring in Egypt: Where Is the Gender Inequality?" Poster presented at the XXVI IUSSP International Population Conference, Marrakech, Morocco.
- Eloundou-Enyegue, Parfait M., and Lindy B Williams. 2006. "Family Size and Schooling in Sub-Saharan African settings: A Reexamination." *Demography* 43 (1): 25–52.

- El-Zanaty, Fatma, and Ann Way. 2001. *Egypt Demographic and Health Survey 2000*. Calverton Maryland [USA]: Ministry of Health and Population [Egypt], National Population Council and ORC Macro.
- El-Zanaty, Fatma, and Ann Way. 2006. *Egypt Demographic and Health Survey 2005*. Cairo, Egypt: Ministry of Health and Population, National Population Council, El-Zanaty and Associates and ORC Macro.
- El-Zanaty, Fatma, and Ann Way. 2009. *Egypt Demographic and Health Survey 2008*. Cairo, Egypt: Ministry of Health, El-Zanaty and Associates and Macro International.
- Gomes, Melba. 1984. "Family Size and Educational Attainment in Kenya." *Population and Development Review* 10 (4): 647–60.
- Hauser, Robert M., and Hsiang-Hui Daphne Kuo. 1998. "Does the Gender Composition of Sibships Affect Women's Educational Attainment?" *The Journal of Human Resources* 33 (3): 644–57.
- Hoodfar, Homa. 1997a. *Between Marriage and the Market: Intimate Politics and Survival in Cairo*. Berkeley, California: University of California Press.
- Hoodfar, Homa. 1997b. "The Impact of Male Migration on Domestic Budgeting: Egyptian Women Striving for an Islamic Budgeting Pattern." *Journal of Comparative Family Studies* 28 (2): 73–98.
- Jansen, Willy. 2006. "Gender and the Expansion of University Education in Jordan." *Gender and Education* 18 (15): 473–90.
- Kaestner, Robert. 1997. "Are Brothers Really Better? Sibling Sex Composition and Educational Achievement Revisited." *The Journal of Human Resources* 32 (2): 250–84.
- Knodel, John, and Malinee Wongsith. 1991. "Family Size and Children's Education in Thailand: Evidence from a National Sample." *Demography* 28 (1): 119–31.
- Li, Hongbin, Junsen Zhang, and Yi Zhu. 2008. "The Quantity-Quality Trade-Off of Children in a Developing Country: Identification Using Chinese Twins." *Demography* 45 (1): 223–43.
- Lillard, Lee A., and Robert J. Willis. 1994. "Intergenerational Educational Mobility: Effects of Family and State in Malaysia." *The Journal of Human Resources* 29 (4): 1126–66.
- Lloyd, C. B., and A. J. Gage-Brandon. 1994. "High Fertility and Children's Schooling in Ghana: Sex Differences in Parental Contributions and Educational Outcomes." *Population Studies* 48 (2): 293–306.

- Lloyd, Cynthia B., Sahar El Tawila, Wesley H. Clark, and Barbara S. Mensch. 2003. "The Impact of Educational Quality on School Exit in Egypt." *Comparative Education Review* 47 (4): 444–67.
- Lu, Yao, and Donald J. Treiman. 2008. "The Effect of Sibship Size on Educational Attainment in China: Period Variations." *American Sociological Review* 73 (5): 813–34.
- Maralani, Vida. 2008. "The Changing Relationship between Family Size and Educational Attainment over the Course of Socioeconomic Development: Evidence from Indonesia." *Demography* 45(3): 693–717.
- Mare, Robert D. 1980. "Social Background and School Continuation Decisions." *Journal of the American Statistical Association* 75 (June): 295–305.
- Mare, Robert D. 2006. "Response: Statistical Models of Educational Stratification: Hauser and Andrew's Models for School Transitions." *Sociological Methodology* 36: 27–37.
- Mare, Robert D., and Meei-Shenn Tzeng. 1989. "Fathers' Ages and the Social Stratification of Sons." *American Journal of Sociology* 95 (1): 108–31.
- Marteleteo, Letícia J., and Laetícia R. de Souza. 2012. "The Changing Impact of Family Size on Adolescents' Schooling: Assessing the Exogenous Variation in Fertility Using Twins in Brazil." *Demography* 49 (4): 1453–77.
- Megahed, Nagwa M. 2008. "Voices of Teachers in Academic and Vocational Secondary Schools in Egypt: Perceived Consequences of Educational Reform for Quality and Equality." In *Education and Social Inequality in the Global Culture*, ed. J. Zajda, B. Biraimah and W. Gaudelli. Dordrecht: Springer.
- Mensch, Barbara S., Barbara L. Ibrahim, Susan M. Lee, and Omaima El-Gibaly. 2003. "Gender-Role Attitudes among Egyptian Adolescents." *Studies in Family Planning* 34 (1): 8–18.
- Moghadam, Valentine M. 2004. "Patriarchy in Transition: Women and the Changing Family in the Middle East." *Journal of Comparative Family Studies* 35 (2): 137–62.
- Moghadam, Valentine M. 2008. "Population Growth, Urbanization, and the Challenges of Unemployment." In *Understanding the Contemporary Middle East*, ed. J. Schwedler and D. J. Gerner. 3rd ed. Colorado: Lynne Rienner Publishers.
- Parish, William L., and Robert J. Willis. 1993. "Daughters, Education, and Family Budgets: Taiwan Experiences." *The Journal of Human Resources* 28 (4): 863–98.
- Park, Hyunjoon. 2008. "Public Policy and the Effect of Sibship Size on Educational Achievement: A Comparative Study of 20 Countries." *Social Science Research* 37: 874–87.

- Pong, Suet-Ling. 1997. "Sibship Size and Educational Attainment in Peninsular Malaysia: Do Policies Matter?" *Sociological Perspectives* 40: 227–42.
- Population Reference Bureau. 2012. *World Population Data Sheet*. Washington, D. C.: Population Reference Bureau.
- Post, David. 2001. "Region, Poverty, Sibship, and Gender Inequality in Mexican Education: Will Targeted Welfare Policy Make a difference for girls?" *Gender and Society* 15 (3): 468–89.
- Post, David, and Suet-ling Pong. 1998. "The Waning Effect of Sibship Structure in School Attainment in Hong Kong." *Comparative Education Review* 42 (2): 99–117.
- Powell, Brian, and Lala Carr Steelman. 1989. "The Liability of Having Brothers: Paying for College and the Sex Composition of the Family." *Sociology of Education* 62 (2): 134–47.
- Powell, Brian, and Lala Carr Steelman. 1990. "Beyond Sibship Size: Sibling Density, Sex Composition, and Educational Outcomes." *Social Forces* 69 (1):181–206.
- Powell, Brian, and Lala Carr Steelman. 1993. "The Educational Benefits of Being Spaced Out: Sibship Density and Educational Progress." *American Sociological Review* 58 (3): 367–81.
- Rammohan, Anu, and Diane Dancer. 2008. "Gender Differences in Intrahousehold Schooling Outcomes: The Role of Sibling Characteristics and Birth Order Effects." *Education Economics* 16 (2): 111–26.
- Razzaque, Abdur, Peter Kim Streatfield, and Ann Evans. 2007. "Family Size and Children's Education in Matlab, Bangladesh." *Journal of Biosocial Science* 39: 245–56.
- Richards, Alan, and John Waterbury. 1996. *A Political Economy of the Middle East*. Boulder, Colorado: Westview Press.
- Rose, Pauline, and Samer Al-Samarrai. 2001. "Household Constraints on Schooling by Gender: Empirical Evidence from Ethiopia." *Comparative Education Review* 45 (1): 36–63.
- Shavit, Yossi, and Jennifer L. Pierce. 1991. "Sibship Size and Educational Attainment in Nuclear and Extended Families: Arabs and Jews in Israel." *American Sociological Review* 56 (3): 321–30.
- Stash, Sharon, and Emily Hannum. 2001. "Who Goes to School? Educational Stratification by Gender, Caste and Ethnicity in Nepal." *Comparative Education Review* 45 (3): 354–78.
- Steelman, Lala Carr, and Brian Powell. 1989. "Acquiring Capital for College: The Constraints of Family Configuration." *American Sociological Review* 54 (5): 844–55.

Steelman, Lala Carr, Brian Powell, Regina Werum, and Scott Carter. 2002. "Reconsidering the Effects of Sibling Configuration: Recent Advances and Challenges." *Annual Review of Sociology* 28: 243–69.

United Nations. 2002. "Fertility Levels and Trends in Countries with Intermediate Levels of Fertility." UN Document UN/POP/CFT/2002/BP/6, United Nations, New York.
<http://www.un.org/esa/population/publications/completingfertility/FFPSPOPDIVpaper.PDF>.

Wang, Wendy. 2005. "Son Preference and Educational Opportunities of Children in China." *Gender Issues* 22 (2): 3–30.

Wolter, Stefan C., and Maja Coradi Veliacott. 2003. "Sibling Rivalry for Parental Resources: A Problem for Equity in Education? A Six-Country Comparison with PISA Data." *Swiss Journal of Sociology* 29 (3): 311–98.

Xu, Jun. 2008. "Sibship Size and Educational Achievement: The Role of Welfare Regimes Cross-Nationally." *Comparative Education Review* 52 (3): 413–36.

Yount, Kathryn M. 2005. "The Patriarchal Bargain and Intergenerational Coresidence in Egypt." *The Sociological Quarterly* 46: 137–164.

Yount, Kathryn M. 2008. "Women's Family Power and Gender Preference in Minya, Egypt." In *Family in the Middle East: Ideational Change in Egypt, Iran and Tunisia*, ed. K. M. Yount and H. Rashad. New York: Routledge.

Yount, Kathryn M., and Hoda Rashad. 2008. *Family in the Middle East: Ideational Change in Egypt, Iran and Tunisia*. New York: Routledge.

Yu, Wei-Hsin, and Kuo-Hsien Su. 2006. "Gender, Sibship Structure, and Educational Inequality in Taiwan: Son Preference Revisited." *Journal of Marriage and Family* 68 (November): 1057–68.

Zhang, Yuping, Grace Kao, and Emily Hannum. 2007. "Do Mothers in Rural China Practice Gender Equality in Educational Aspirations for Their Children?" *Comparative Education Review* 51 (2): 131–57.

Figure 1: Logistic regression odds ratios of the impact of sibsize on conditional grade progression ratios controlling for birth year (cohorts 1983-1999) by sex, Egypt 2000, 2005, and 2008.

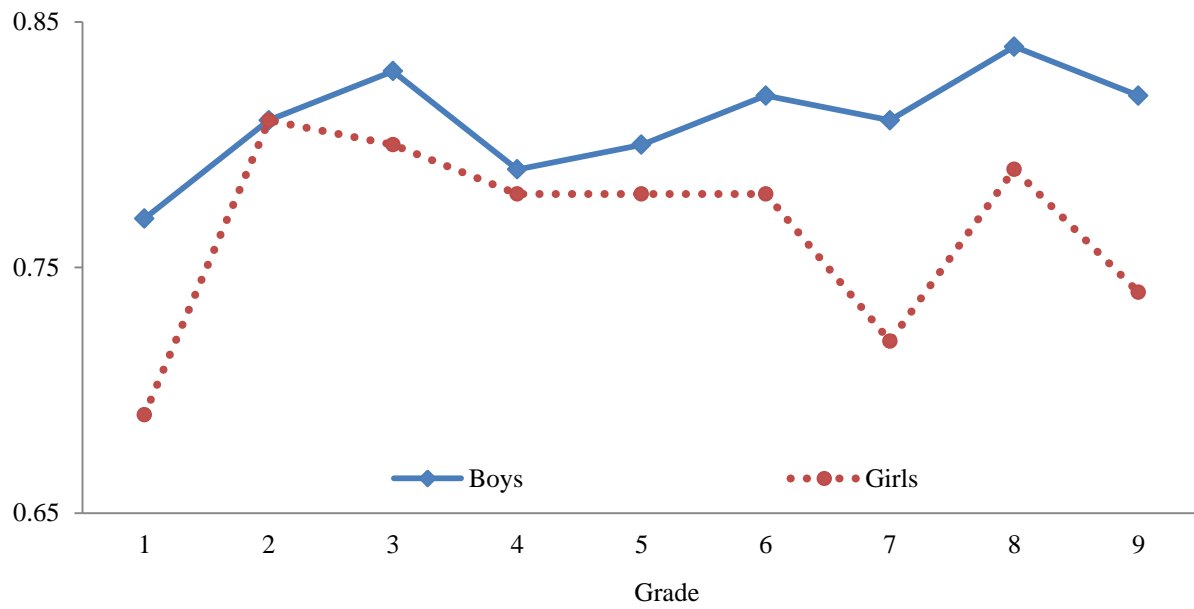


Figure 2a: Logistic regression odds ratios of the impact of the number of brothers and the number of sisters on conditional grade progression ratios controlling for birth years (cohorts 1983-1999) for boys, Egypt 2000, 2005, and 2008.

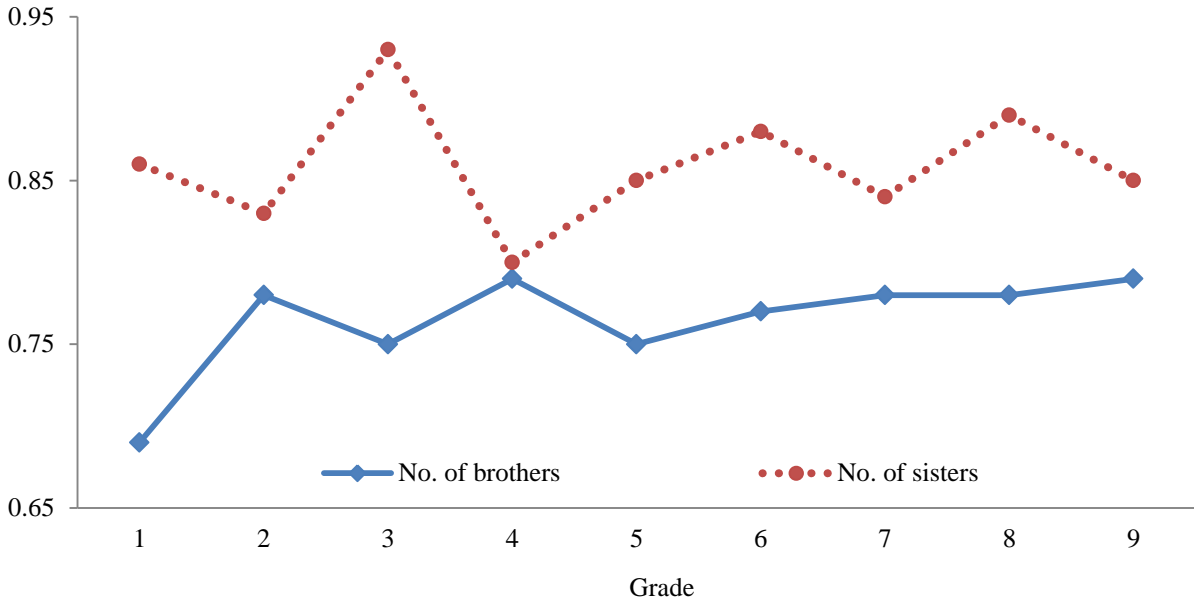


Figure 2b: Logistic regression odds ratios of the impact of the number of brothers and the number of sisters on conditional grade progression ratios controlling for birth years (cohorts 1983-1999) for girls, Egypt 2000, 2005, and 2008.

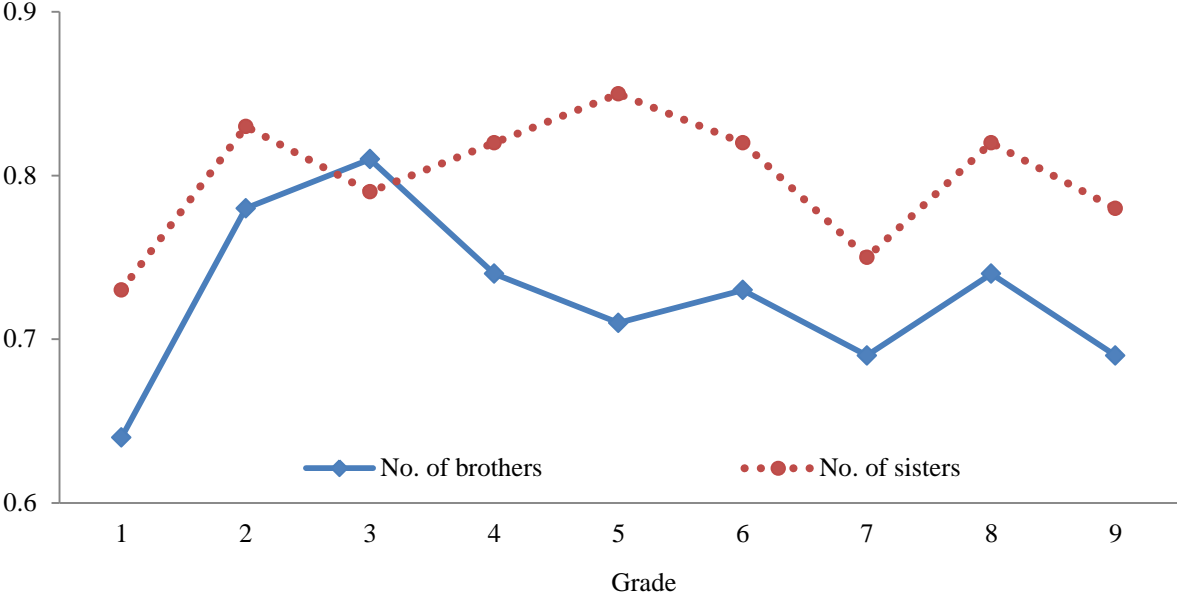


Table 1: Logistic regression odds ratios of the impact of sibling composition on conditional grade progression ratios controlling for birth year (cohorts 1983-1999) by sex, Egypt 2000, 2005, and 2008

Variables	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
BOYS									
No. of older brothers	0.70***	0.74***	0.77***	0.80***	0.73***	0.79***	0.77***	0.81***	0.76***
No. of older sisters	0.89***	0.88	0.91	0.80***	0.87**	0.85***	0.88**	0.89	0.88
No. of younger brothers	0.63***	0.83	0.71***	0.75***	0.79***	0.74***	0.77***	0.74***	0.82*
No. of younger sisters	0.73***	0.74	0.95	0.78***	0.81***	0.91	0.80***	0.88	0.81**
<i>Sample size</i>	27,384	23,439	20,097	16,927	13,632	10,456	7,417	4,641	2,211
GIRLS									
No. of older brothers	0.67***	0.81*	0.93	0.80***	0.71***	0.73***	0.67***	0.75***	0.70***
No. of older sisters	0.75***	0.82*	0.75***	0.78***	0.93	0.84**	0.76***	0.83*	0.79**
No. of younger brothers	0.49***	0.71**	0.61***	0.65***	0.64***	0.71***	0.71***	0.72***	0.68***
No. of younger sisters	0.59***	0.81	0.77*	0.86	0.73***	0.79***	0.75***	0.82**	0.77***
<i>Sample size</i>	25,754	20,731	17,633	14,768	11,939	9,121	6,523	4,127	1,948

Note: * p <0.05; ** P <0.01; *** P <0.001.

Figure 3: Logistic regression odds ratios of the impact of sibsize on conditional grade progression ratios controlling for birth year (cohorts 1983-1999), fathers' education, mothers' education, mothers' age at first marriage and mothers' age at child's birth by sex, Egypt 2000, 2005, and 2008.

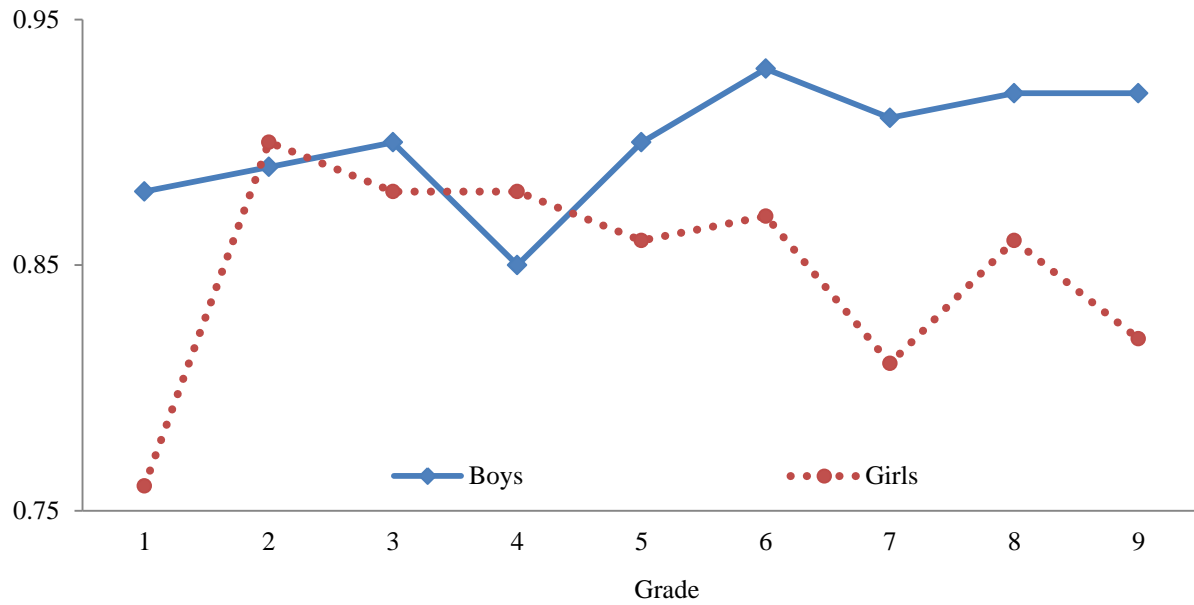


Figure 4a: Logistic regression odds ratios of the impact of the number of brothers and the number of sisters on conditional grade progression ratios controlling for birth years (cohorts 1983-1999), fathers' education, mothers' education, mothers' age at first marriage and mothers' age at child's birth, for boys, Egypt 2000, 2005, and 2008.

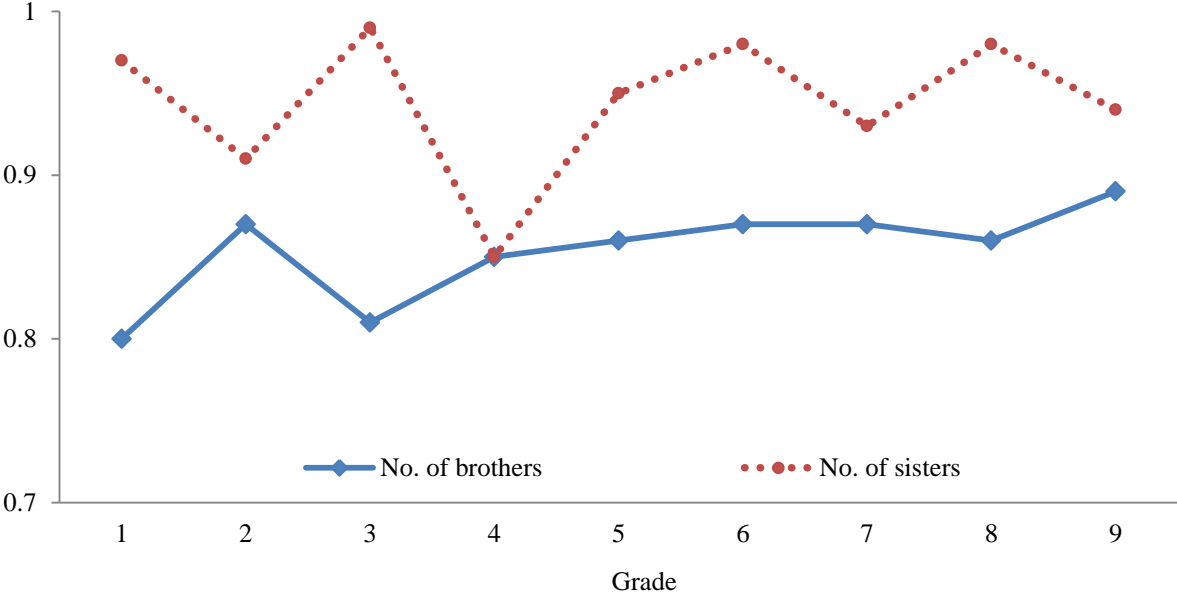


Figure 4b: Logistic regression odds ratios of the impact of the number of brothers and the number of sisters on conditional grade progression ratios controlling for birth years (cohorts 1983-1999), fathers' education, mothers' education, mothers' age at first marriage and mothers' age at child's birth, for girls, Egypt 2000, 2005, and 2008.

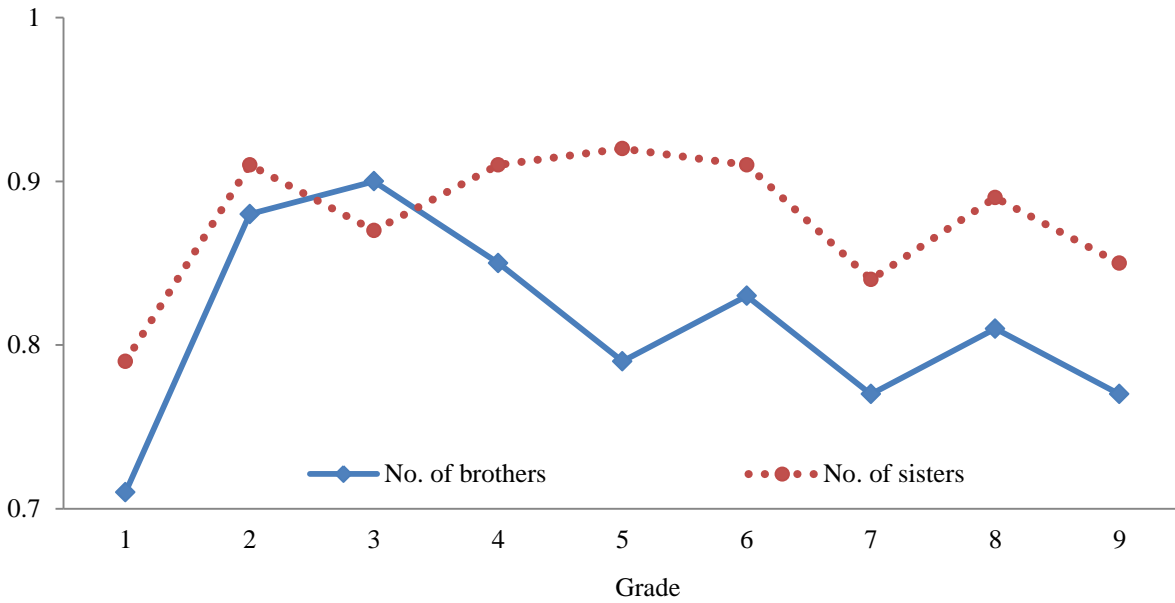


Table 2: Logistic regression odds ratios of the impact of sibling composition on conditional grade progression ratios controlling for birth year (cohorts 1983-1999), fathers' education, mothers' education, mothers' age at first marriage and mothers' age at child's birth by sex, Egypt 2000, 2005, and 2008

Variables	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 9
BOYS									
No. of older brothers	0.86**	0.84	0.78*	0.85*	0.83**	0.92	0.91	0.88	0.86
No. of older sisters	1.07	0.96	0.90	0.84*	0.97	0.97	1.02	0.96	0.99
No. of younger brothers	0.73***	0.93	0.84	0.84*	0.89	0.83**	0.86**	0.85*	0.93
No. of younger sisters	0.81***	0.81	1.10	0.87*	0.91	1.02	0.87*	1.00	0.89
<i>Sample size</i>	27,352	23,410	20,073	16,907	13,616	10,445	7,411	4,638	2,211
GIRLS									
No. of older brothers	0.82***	0.93	1.18	0.93	0.83*	0.83*	0.74***	0.81*	0.78*
No. of older sisters	0.89***	0.92	0.93	0.87	1.05	0.90	0.85*	0.87	0.88
No. of younger brothers	0.59***	0.81	0.68**	0.78**	0.75***	0.83**	0.81**	0.81*	0.76**
No. of younger sisters	0.68***	0.91	0.85	0.99	0.83*	0.91	0.83**	0.90	0.85*
<i>Sample size</i>	25,710	20,699	17,605	14,745	11,920	9,108	6,513	4,122	1,946

Note: * p <0.05; ** P <0.01; *** P <0.001.

