

Fertility decline and marital gender relations in Egypt

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I. INTRODUCTION

Many low-income countries have experienced the dramatic expansion of contraceptive options and significant fertility declines in recent decades, often in a single generation. Because of the central role of fertility in societies, with families serving as the central organizing principle of society and reproduction a fundamental component in the identities of men and women, such a change—dramatic in both magnitude and speed in many places—may well foster significant ripple effects in social norms, systems, and structures that support childbearing and fertility as an institution. Thus a number of scholars have posited that the rapid decline in fertility may foster changes in gender relations at the individual level and in gender systems—such as in such as kinship systems, gender norms, and the functioning of the labor market—at the societal level (Dyson 2001; Malhotra 2009; Mason 1997; MacDonald 2000; McNay 2005). As Mason (1997) notes, “modern demographic regimes... may be a precondition for gender change.” Given the widespread, rapid, and dramatic fertility declines in currently and recently industrializing nations, it is important to understand the consequences of such declines for women, men, and society.

This article investigates one piece of the hypothesized relationship between fertility decline and changing gender relations at the societal level: we examine the role of fertility decline in explaining changes in spousal age and education gaps at the societal level. We do so by examining patterns of association by age cohort and region over time in Egypt. Spousal age and education gaps are thought by many scholars to be a key indicator of the gendered functioning of marriage. Previous research has demonstrated that these gaps between spouses may be important indicators of the nature of marital gender relations, and has frequently found such gaps to be associated with women’s limited decisionmaking power, intimate partner violence, and increased health risks (e.g., Castro et al. 1008; Hindin et al 2008; Yount 2005). We examine these patterns of association at the societal level rather than the individual level—using aggregated groupings by age and geographic location—to better capture the dynamics of social change and understand whether fertility decline can foster more fundamental changes in societal-level gender systems.

After examining the associations at this more macro-level using fixed effects models, we then analyze recent individual-level survey data to further elucidate what spousal age and education gaps might mean for women and men and their marital gender relations in Egypt. Given the role that spousal age and education gaps may play in shaping spousal marital gender dynamics and women’s ability to influence life decisions both major and minor at the individual level—and the potential for couple-level change to foster widespread change in the gendered functioning of marriage at the societal level, they are important possible consequences of fertility decline.

II. CONCEPTUAL FRAMEWORK: CAUSAL PATHWAYS

In the present study, we suggest that fertility decline, largely through gains to girls' education, a reduced pool of male kin for endogamous marriage, and changing expectations surrounding marriage have led to reductions in the gap in the age and educational level between spouses. These reductions in spouse age and education gaps may mark the beginning of a transformation in marital gender relations and subsequently for gender inequities in Egyptian society more broadly. The pathways that may link fertility decline and gender change—and specifically changes in spousal age and education gaps—are complex, recursive, and multidimensional. We describe our conceptual framework in more detail below.

Extensive previous research has documented the important influences of contextual characteristics in structuring the possibility and extent of change. The considerable regional and urban/rural variations in

gender norms and declines in fertility over time in Egypt, as well as the variations in a host of other factors that may shape age and education gaps, suggest that the integration of these dimensions into our analysis is warranted. We suggest that fertility declines together with socio-economic realities within different contexts foster distinct expectations for women's roles relative to men's both within and outside of the household. Thus examining these dynamics by region/context is essential. In addition, change may begin to appear in younger age groups—that is, newer entrants into the marriage market—long before it becomes apparent in the nation as a whole, especially in times of rapid social change. Thus a more careful analysis by age group is also warranted, and we examine patterns of change across age groups in our analysis.

And finally, our analyses examine these changes over time because many of the mechanisms we posit as fostering these changes are likely to be reinforced in successive generations. Moreover, Malhotra (2009) suggests that the relationship between fertility decline and gender change (in the form of spousal age and education gaps) is more likely to play out in countries with mature fertility transitions; thus it behooves us to examine the relationship as it transpired to determine if there are hints of change over time instead of trying to understand it based on the current state of fertility and gender relations in Egypt. Examining these relationships over time gives us insight into the *process* of social change.

A. CHANGES IN INVESTMENTS IN GIRLS' EDUCATION

Demographers have long referenced the “quantity-quality” tradeoff in association with fertility decline—the increasing focus on producing a smaller number of educated, modern, healthy children—that is associated with fertility decline (Caldwell 1982; Becker). They argue that with fewer children, parents have more resources to allocate toward their children to produce “higher quality” children. Thus, they argue, fertility decline will foster increasing investments in children's health and, importantly for this paper, education. Note that because of prevailing gender norms and son preference in many regions, including Egypt (e.g., Yount 2009), parents may not choose to allocate their resources equally to their sons and daughters. Nevertheless, girls are likely to benefit from this increased investment and make gains in educational attainment to some extent. While these changes are hypothesized to occur at the individual-level, it follows that societal-level policy initiatives might mirror the desire for increased investments in health and education—in *response* to pressure from parents or for other reasons. For example, after gaining independence in 1952, the Egyptian government prioritized the country's “modernization” and to that end, made primary education compulsory (Sieverding 2011), and a similar rationale motivated the initiative to make the three years of preparatory education compulsory in 1981.

Investments in education have certainly taken place in Egypt; there have been significant increases in enrollment and attainment for both sexes over the past several decades. For example, among the 1942-53 birth cohort, 62 percent of males and 80 percent of females had less than a primary education compared to 17 percent of males and 26 percent of females among the 1983-88 cohort. Similar gains can be seen in vocational secondary education (Sieverding 2011). Although these investments have benefitted children of both sexes, we are primarily concerned with increased investments in girls' education because of the striking change it signifies from the past and the dramatic impact that education can have on the attitudes and behaviors of girls and women, with the potential for sparking further social change (Jejeebhoy and Sathar 2001; Malhotra et al. 2003; Mernissi 1982).

These increased investments in girls' education in Egypt rather seem to reflect more traditional gender roles; girls' education still represents more of a “social value” to their families than an economic one. For example, in a survey of mothers and fathers of Egyptian adolescents conducted in the late 1990s, more than two-thirds of parents felt that education makes a girl a better parent and helps her deal better with life and only about half believe that education benefits girls by increasing job opportunities, while similar figures concerning boys were 47 percent and 70 percent (Mensch et al 2000/2003). Moreover, given the low returns to girls' schooling in the Egyptian labor market (Assaad and ElBadawy), many researchers

suggest that parents' investments in girls' education is due in part to the returns they expect to see on the marriage market (MacLeod 1991; Lloyd et al. 2003; Mensch et al. 2003; Elbadawy 2009). Parents recognize the social mobility that may result from a woman being able to marry "up"—to marry a wealthier and/or more educated house—if she has achieved a certain level of education (Elbadawy 2009; Lloyd et al. 2003).

Thus, while these investments may not have reflected a gender-egalitarian or progressive ideology—at least not initially, their consequences may well have planted the seeds for future changes in gender norms in subsequent generations.

B. CHANGING SIZE AND SEX COMPOSITION OF GENERATIONS

A second potential pathway linking fertility decline and declines in spousal age and education gaps may be through changes in the number and sex composition of children within families fostered by fertility decline. With couples having fewer children, the odds of having one child of each sex increases and the likelihood that a child of one sex will have a same-sex sibling decreases. This dynamic is especially relevant here as it pertains to the number of brothers in a given generation. Fargues (2005) contends that with fewer siblings, and especially fewer brothers, men have less familial support for patriarchal traditions and norms. Weinreb (2006) builds on this argument, noting that having fewer brothers makes it more difficult to maintain the tradition of consanguinous marriage because it reduces the number of "preferred" cousins available for endogamous marriage. In Egypt, first paternal cousins are the preferred mate pairs. With fewer brothers in a given generation, families may be forced to resort to marriages with more distant kin, with concomitant reductions in the unified familial control over the marriages resulting from such marriages, and to arrange fewer kin marriages altogether (Weinreb 2006). With less familial reinforcement for patriarchal and age-hierarchical norms and traditions, such as kin marriages and large age and education differences between spouses, changes in the spouse selection and marriage negotiation processes may result.

C. CHANGING NORMS CONCERNING COMPANIONATE MARRIAGE

Fertility decline may also foster reductions in spousal age and education gaps through its impact on norms concerning companionate marriage. In particular, fertility decline may foster the increasing centrality of the marital relationship and the increasing primacy of the bond between husband and wife. With fewer children, couples may have more time and space available for the marital relationship—in terms of increasing time, resources, and emotional "space". For example, couples may have more opportunity to develop sexual intimacy; with fewer children, couples spend less time spent in the post-partum taboo state during which sexual relations are forbidden, less time in late-term pregnancy when sexual relations can be difficult or uncomfortable, and less time breastfeeding and potentially cosleeping with children. While the latter does not necessarily deter sexual relations in societies in which it is traditional, it can interfere and deter couple intimacy. Companionate marriage norms may also be supported by declines in kin marriage or kin marriages among more distant cousins stemming from fertility decline; Fargues (2005) suggests that sexual attraction may be minimal among close cousins because they have been raised more like siblings, whereas it may be stronger among more distant cousins or in non-kin marriages, which may foster sexual intimacy in the marital relationship. And finally, with fewer children (and longer lifespans), couples spend a greater proportion of their lifecourse together without childbearing and rearing responsibilities. This may enable them to develop emotional intimacy with each other in ways that previous generations could not.

Increasing support for the notion of companionate marriage may both drive young people in search of spouses to seek age and education peers as potential mates and drive parents—especially those who have experienced companionate marriage themselves or who have come to see it in a positive light—to seek companionate marriages for their children. Such changes may be facilitated by increasing levels of education; as Caldwell (1982) notes, education often means increasing exposure to Western or modern

ideals, including ideals concerning family and gender norms, both of which present companionate marriage in a positive light. To the extent that individuals of the same generation and the same experience with education are more likely to have common interests, this may reduce the age and education gaps between spouses. Egypt's rising preferences for and increasing movement toward nuclear family structures rather than coresidence with husband's parents (Amin and al-Bassusi 2004) may also reinforce this change; the formation of a nuclear household removes couples from the traditional scrutiny of older generations on a daily basis and allows more space for gender norm change between couples.

D. THE CONSEQUENCES OF THESE CHANGES

Taken together, increasing education, and especially girls' education, changing marriage patterns, and changing norms related to companionate marriage may serve to reduce spousal age and education gaps in several ways.

The first is a simple numerical explanation. If girls' educational attainment has increased faster than boys' attainment, reductions in spousal education gap may be simply due to the fact that the pool of girls with less education has grown smaller relative to the pool of boys at a given level of attainment. According to Barro and Lee (2000), girls' primary school has risen faster than boys' in many of the years under observation in this study, but by no means all. However, secondary school attainment has been rising much more equally for both sexes (UNESCO 2011). Thus the numerical explanation may be only one component of the causal pathways.

Moreover, because more educated girls can garner a higher "price" in the marriage marketplace—albeit with caveats if they are "too" educated—and thus are more likely to be married to a wealthier man or, to the extent that education facilitates wealth, an educationally comparable man. In addition, education is strongly associated with increasing levels of confidence, self esteem, agency, autonomy, and empowerment for girls, especially among those who have achieved post-primary education (Jejeebhoy and Sathar 2001; Malhotra et al. 2003; Mernissi 1982). Consequently, girls might be more confident in asserting their desires concerning the timing of marriage, the type of spouse desired, and opinions on specific potential husbands presented to her, and more able to influence their parents in the process. Similarly, if child has more education than parents, the traditional age hierarchy between parents and children may be upended, or even reversed (Fargues 2005; El-Tawila et al 2003). Fargues suggests the fact that many girls have now obtained more education than their fathers poses an inherent threat to the patriarchal system, creating the potential space for gender and generational change. If children desire a comparably educated spouse or an age peer, they may be more likely to succeed in getting one.

Education has also been found to increase preferences for role sharing in future marriage among both adolescent boys and girls, but especially among adolescent girls (El-Tawila et al 1999); to the extent that a girl might perceive this to be more possible with a spouse who is comparable in age and/or education, this may be another avenue of change. Education may also increase both girls' and boys' orientation from parents to peers in ways that may shape their preferences for spouses of similar age and educational levels (Schlegel 1995). It is plausible that this increased orientation to peers might extend to spouse selection, and to the desire for a spouse to be more of a peer than spouses have been in earlier generations.

Education may also increase contact between girls and boys, as those who attend school are exposed to a greater number of potential mates than those who do not, in the classrooms, during recesses, and on the way to and from school. Although this may be less of an influence in Egypt than in other settings because schools are typically sex-segregated beyond primary school, students of both sexes may still interact on the way to and from school; school enrollment legitimizes the movement of girls and young women around the community (Fargues 2005). Thus, this increases one's exposure to individuals who are peers in terms of both age and educational attainment. While in the absence of changes in the spousal selection process or preferences for companionate or non-kin marriage, this would not have much of an influence

on spousal age and education gaps, in the presence of such changes, it may have the effect of bringing age peers and education peers into consideration as potential spouses.

Furthermore, changes in the process of spouse selection and marriage negotiation themselves may also mediate the effects of fertility decline on spousal age and education gaps. As noted above, fertility decline may reduce familial support for patriarchal and age-hierarchical norms and traditions, such as kin marriage and large spousal age and education gaps through reductions in the size and sex composition of siblings in families. Moreover, the reduction in the number of siblings in a given family also means that parents have fewer chances to make successful familial alliances through the marriage(s) of their children, and it becomes more important for each individual marriage to succeed. Thus parents may be more motivated to ensure their children are compatible in marriage and at lower risk of divorce. To the extent that they believe that marriage to an age peer—someone from a similar generation—is more likely to succeed, or, to the extent that they are more likely to accede to a “love match” or an appropriate match with someone met through school, who is more likely to be an age peer and comparably educated, then fertility decline may reduce spousal education and age differences. These disruptions to consanguineous marriage possibilities and consequently, potentially reduced direct involvement of a man’s brothers in the marriage negotiations for his children may plant seeds of change in the spouse selection and marriage negotiation process. This may open up the possibility for reductions in spousal age and education gaps.

In sum, increasing girls’ education, changing marriage patterns, and changing norms related to companionate marriage may serve to reduce spousal age and education gaps. We describe the present study in greater detail below.

III. THE PRESENT STUDY

In this study, we address two research questions:

- 1) Is fertility decline at the subgovernorate level associated with changes in spousal age and education gaps in Egypt for groupings of women by age and subgovernorate?
- 2) Are spousal age and education gaps associated with more egalitarian household decisionmaking and less tolerance for domestic violence at the individual level in Egypt?

We use the analysis of survey data from multiple time points as the foundation of this study. To address the first research question, we focus conceptually on the collective experiences of Egyptian couples over time—broken down by age and subgovernorate (the rural and urban portion of each governorate)—as an indicator of gender relations, and pair this with subgovernorate-level fertility data to determine whether fertility decline is associated with shifts in spousal age and education gaps. We examine the dynamics of fertility and spousal age and education gaps over time among couples and examine their association with changes in fertility at the sub-governorate level. If our hypothesis is correct that fertility decline influences spousal age and education gaps, and that this relationship varies by region and age, we would expect to see stronger associations in subgovernorates with lower fertility and among younger age groups.

The second question focuses conceptually on the individual level, and the analysis uses multivariate analysis to examine associations of spousal age and education gaps and different indicators of marital gender relations reported by individual women, including household decisionmaking and attitudes toward domestic violence, net of other predictors of these dynamics. If our hypothesis is correct that spousal age and education differences influence marital gender relations, then we would expect to significant associations between spousal age and education gaps, net of other characteristics.

DATA, MEASURES, MODELING STRATEGY AND ANALYSIS PLAN

A. DATA

a. Census Data: Bonneuil and colleagues (2006) used data from the 1960, 1976, 1986, and 1996 Egyptian censuses to calculate the total fertility rate (TFR) for the urban governorates and for the urban and rural portions of each governorate in Upper and Lower Egypt, making adjustments for infant mortality and underreporting using data from other sources. We use these data to indicate the fertility regime at this meso-level, which for ease of reference we call the subgovernorate level, because the conditions at this level are perhaps more relevant to women lives than the national-level fertility regime. These data are used to construct the main independent variable in the analysis for Research Question 1.

b. Egyptian Demographic and Health Surveys: The analyses concerning both Research Question 1 and 2 rely on Egyptian Demographic and Health Survey (EDHS) data. Six standard EDHS have been conducted in Egypt, in 1988, 1992, 1995, 2000, 2005, and 2008. These surveys obtained data from ever-married women ages 15-49, including indicators of gender attitudes and empowerment experiences, fertility, health, and sociodemographic characteristics about the woman, her husband, children, and household.

B. MEASURES

a. RESEARCH QUESTION 1: MACRO-LEVEL ANALYSIS

Unit of Analysis/Analytic Sample: Because we seek to explore changes in spousal age and education gaps at the societal level, these analyses use data aggregated by survey year, age, and geographic subdivision as the units of analysis. In particular, we constructed a dataset by aggregating individual-level data from each survey wave into 5-year age groups within specific subgovernorates—the urban governorates and the urban and rural portions of each governorate. Within each survey year, we first grouped individual women in each survey into their subgovernorate (e.g., urban Qena, rural Qena, rural Sohag, Cairo, and so on) and then into 5-year age groups (e.g., 20-24 year olds, 25-29 year olds, and so on). The small number of married 15-19 year olds in a given subgovernorate prevented the inclusion of women ages 15-19 in the analysis entirely. More information on the construction of each variable and on the final analytic sample is given below.

Dependent Variables: The main dependent variables of interest are measures of the age and education gaps between husband and wife. To construct each of these measures for this analysis, we used the raw individual data from each survey year to determine the age gap and the education gap between each woman and her first husband. For the **spousal age difference**, the woman's age was calculated from the month and year of birth given in the survey, and checked against the age also provided by the respondent. The man's age was calculated using the month and year given by the respondent for her husband's date of birth or, if those responses were missing, we used his reported age (also provided by the respondent). We then calculated the difference in their ages by subtracting one from the other, such that negative values indicate that the wife is older and positive values indicating that the husband is over. For the **spousal education difference**, the number of years of completed schooling was used to calculate the wife's education level and her husband's, and the difference was calculated by subtracting one from the other such that the value was negative if the wife had more schooling and positive if the husband had more schooling.

After creating the individual-level variables, we used Stata's "collapse" command to aggregate each variable to the age group/subgovernorate level. Thus in the final data set we ended up with variables with different values for women in different age groups, subgovernorate, and year. Thus, for example, we have

a measure of the spousal age gap for 20-24 year old women in rural Sohag in 1988, as well as one for the same age group and in the same location from 2000.

Separate models will be conducted for the two independent variables of interest. Both **median spousal education difference** and the **median spousal age difference** are included as continuous variables.

Independent Variables: We examine the effects of two different fertility-related variables, the **absolute level of fertility** (given by the TFR) and the **average annual percent change in TFR**, both based on Census data (Bonneuil et al 2006). The absolute level of fertility decline is important because shifts in gender relations may not be visible in a society until its fertility transition matures (Malhotra 2009) and because previous research suggests that reaching a certain threshold level of fertility may be necessary before changes are observed (Lee-Rife et al 2010). The pace of fertility decline is important because it might influence the ability of a given society to “absorb” the changes.

Because both the age and education differences between spouses are fixed at the time of marriage¹, the fertility regime must be measured prior to the time of marriage. However, since the members of each generation marry at different times, it is not possible to fix a single point in time to this end. Thus the fertility measures will be lagged to reflect the fertility regime in place when those at the midpoint of the age cohort reached age 15. To determine the appropriate lag, we conduct the following calculation for each age group and each survey year:

[year of survey - (median age of cohort - years since age 15)]

and use the TFR for the specific geographic location closest to, but preceding, that year. For example, the median age of those ages 35-39 is 37.5; thus the calculation of the appropriate lag for those aged 35-39 for the 2000 survey is: $[2000 - (37.5 - 22.5)] = 1978$. The available fertility data closest (but still prior) to 1978 would be from the 1976 census. Thus for that age group in 2000, the fertility regime measure would reflect the total fertility rate from 1976 in their specific subgovernorate.

The absolute total fertility rate variable simply uses the Bonneuil data unaltered. The average annual percent change in TFR is calculated by assuming a uniform annual change for each year between the measurements, and is calculated according to the following equation:

$$\{[(TFR \text{ in year } Y - TFR \text{ in year } X) / TFR \text{ in year } X * 100] / \text{Number of years since Year } X\}$$

where year X precedes year Y.

Key Control Variable: Because we contend that changes in girls’ education may be a key mediator of the relationship between fertility decline and spousal age and education gaps, one important control variable included in the analysis is the **male/female enrollment ratio for primary education**. An alternative specification of this variable will also be tested: the **proportion of girls enrolled in primary education** over time during the period of study. While the ratio of male to female enrollment has important implications for the relative numbers of educated young women and men on the marriage market at a given time, other hypothesized mechanisms operate more straightforwardly through increases in girls’ school enrollment. Thus both specifications of this variable will be examined.

Modeling Strategy and Analysis Plan: We use fixed effects models to examine the associations between fertility decline at the subgovernorate level and spousal age and education gaps. Fixed effects

¹ Few women in Egypt continue their education following marriage.

models allow us to control for both spatial and temporal autocorrelation, and control for unmeasured characteristics within geographic units and over time.

b. RESEARCH QUESTION 2: INDIVIDUAL-LEVEL ANALYSIS

To address Research Question 2, we conduct multivariate analysis of 2008 EDHS data at the individual- or couple-level, examining associations between spousal age and education gaps and several measures of marital gender relations.

Dependent Variables: This analysis focuses separately on women's reported experiences with their husbands as well as their attitudes, as there can be a large disparity between them.

Justification for Domestic Violence: Respondents were asked whether they thought a husband was justified in beating his wife in a range of situations, including whether she burns the food, neglects the children, argues with her husband, goes out without telling her husband, or if she refuses to have sex with him. These are important indicators of marital gender relations, as they reflect the woman's view that a husband has a right to physically discipline his wife for any reason. As Kishor and Johnston (2004) note, these variables indicate women's "acceptance of unequal gender roles on the one hand and a lack of conscientization about women's entitlement to bodily security and integrity, on the other." We created a **count of the number of situations** in which which the woman justifies violence (maximum of 4). We then examined several of the situations separately because of their particular salience to marital gender relations and their traditional importance to the wife role in Egypt—as caretaker of children, as a sexual companion for her husband, and as a provider of food. Thus we examine whether the respondent believes violence is justified if she **refuses to have sex** with her husband, **burns the food**, and **neglects their children** in separate models. Each of these variables is coded 1 if she agrees that violence is justified and 0 if she does not.

Household Decisionmaking: Respondents were also asked questions about who in the household has the last word on decisions including **visits to relatives and friends**, the **use of family planning**, and **small and large household purchases**; possible responses included the husband, the wife, or someone else. Since our goal is to explore the implications of spousal age and education differences on marital gender equality in particular, we focus on whether these decisions were made **jointly** or not. Thus variables were coded as 1 if the respondent reported that she and her husband both had the last word on the decision and 0 if they did not.

Independent Variables: These include measures of the **gaps between husbands and wives in age and education level**. These variables are measured at the individual level, using the variables described above as they were initially constructed, before aggregation.

Control Variables: Other predictors include respondent's **age**, **region** of current residence, **household wealth index**, **religion**; and respondent's **number of living children**. In models concerning spousal education gaps, **educational attainment** of the husband and wife are included, and in models concerning spousal age gaps, the **age of marriage** of both husband and wife are included.

Modeling Strategy/Analysis Plan: We use ordinary least squares regression and logistic regression for these analyses. All models use Stata's "svy" commands and weights to adjust the estimates for the complex survey design used in the Demographic and Health Surveys.