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Research Article

Childbearing intentions among Egyptian men and women: The role of gender-equitable attitudes and women's empowerment

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Abstract

OBJECTIVE
In a context of economic uncertainty and rising actual and ideal fertility, our analysis addresses the question of what factors can be related to the desired family size for both women and men of different generations.

METHODS
Using data from the 2015 Egypt Health Issues Survey (EHIS), we use Poisson regressions to model the factors affecting women's and men's ideal number of children. Our main explanatory variables are male and female gender-equitable attitudes and female empowerment.

RESULTS
More traditional gender attitudes are associated with a high level of desired fertility. Women exposed to mass media want fewer children than those not exposed, while no relationship emerged for men. The results regarding women's empowerment confirm the role of female education, while paid work unexpectedly shows a positive association with the ideal number of children. Our findings show that Egyptian married women's participation in family decisions is a salient aspect of their agency. Finally, we found that region and type of residence are highly associated with desired fertility for both men and women, confirming the importance of the social context where individuals live in their fertility behaviour.

CONTRIBUTION
Our work contributes to the existing literature on fertility in two important ways. Firstly, this is the first study of the fertility intentions of both men and women in Egypt. Second, we adopt a gender perspective by analysing the factors affecting the ideal number of

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children in Egypt, looking at male and female gender-equitable attitudes and women's empowerment.

1. Introduction

Over the last decades the demographic transition and family modernisation[3] process seemed to be established and irreversible in many Arab countries of the Middle East and North Africa (MENA), thus affecting the key aspects of society, in particular marriage, childbearing, women's status, and care of older persons (De Bel-Air 2012; Mirkin 2010; Olmsted 2003). The fertility pattern across the region has been very heterogeneous, although many countries started exhibiting a decline in fertility in the last decades of the 20th century (Engelhardt and Schulz 2017; Casterline 2009; Eltigani 2009). However, in very recent years, fertility is back on the rise in some Arab countries. In particular, a slight fertility increase was observed in Tunisia and Morocco between 2005 and 2015, while a persistent increase was observed in Algeria and Egypt between 2000 and 2015 (United Nations 2019). Also, while fertility has remained stable in Libya, Lebanon, and Oman, it has fallen in the other Arab countries, i.e., Djibouti, Bahrain, Jordan, Kuwait, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, and Yemen.

The atypical fertility increase in recent years has been particularly striking in Egypt, where the demographic transition was thought to be an accomplished fact (Courbage 2015a; Al Zalak and Goujon 2017). In Egypt the demographic regime is still characterized by nearly universal and relatively early marriage, with couples having their first child soon after marriage, and usually rejecting the one-child family model (El-Zeini 2008; Ambrosetti 2011; Samari 2017).

Egypt is the most populous country in the Arab world, with 100 million citizens at the beginning of 2020, and is set to grow to about 121 million by 2030 (United Nations 2019, medium variant). The dramatic demographic change is a national political issue in the country. Indeed, on the 24 July 2017, while attending the 4th National Youth Conference held at the Alexandrina Bibliotheca, President Abdel Fattah El Sisi said: "the greatest two challenges Egypt is facing are terrorism and population growth. We positioned those who try to kill us with the population growth, as a challenge. This (population growth) reduces Egypt's opportunities for progress. […] The challenges that

[3] Even if there is no standard definition of the family modernisation process, literature mostly refers to the process of adapting family strategies to changes in external economic and social development, within specific social and cultural contexts. Most attention has been devoted to the role of the family in the contexts of industrialisation and urbanisation, marriage and sexual behaviour, education, childrearing, relations between kin and between generations, and family strategies for combining female paid work and care-work (Hareven 2000; Baschieri 2007).

we are facing are 'shared' challenges between the state and the people" (Al Sherbini 2017). After El Sisi's speech, the Ministry of Health and Population together with the Ministry of Social Solidarity announced a new family planning campaign targeting rural areas, where the fertility rate is particularly high (Awadalla 2017). The campaign, launched in 2017, was called *Itnein Kifaya* (Two is enough) and aimed to raise Egyptian women's awareness of the need to curb population growth. For this purpose, workshops, conferences, and door-to-door activities were organised and directed at poor households that were the recipients of the *Takaful* (Solidarity) Program funded by the World Bank in 2015. In particular, it was an income support programme providing health assistance, nutrition, and education for children as well as sexual and reproductive healthcare, and directed at families with children aged 0–18. The key messages were education and women's empowerment.

For instance, the programme included the distribution of birth control methods among 1.3 million mothers under 35, in order to discourage women from having more than two children. As stated by the Egyptian Minister of Social Solidarity, Ghada Wali, during a conference on population and development, about 65% of poor people in Egypt come from oversized families, mostly residing in disadvantaged and rural areas (Al Sherbini 2017). Hence, a quantitative goal of the programme was to reduce the fertility rate from 3.5 to 2.4 children per woman by 2030. This policy's goal is a target population of 112 million by 2030, slowing down the mean rate of population growth from 1.6% to 1.2%.

In February 2020 the Prime Minister announced that the Egyptian government was restricting both the ration card system and the *Takaful and Karama* (Solidarity and Dignity) project so that only two-child households receive financial aid. This means that only firstborn and the second-born children are assigned subsidies, with families providing for any further children (Eman 2018; Egypt Independent 2020).

As suggested by institutional demography, which studies the role of the government in the demographic transition, the actions of the Egyptian government can be categorised as direct because "the state develops, funds, and manages programs that seek to influence family-size outcomes through information, advocacy, economic inducement, or political press" (McNicoll 2001: 139). In this context, it is worth noting that the promotion of smaller families is a change of course in the well-established family planning policies of the Egyptian government.

Couples desiring a reduction in family size has been proposed as an essential precondition for the fertility transition to take place (Bongaarts and Casterline 2018). If there were no constraints on having children and perfect fertility control, the personal ideal family size would be the same as the desired family size (Thomson 2015). Moreover, ideal family size may be interpreted as a societal norm that is evolving together

with major societal changes witnessed over the last decades (Sobotka and Beaujouan 2014).

The study of the ideal family size, as well as fertility determinants, emerged at the end of the 1970s in the context of high-fertility research. Since then, the Committee of Population and Demography of the National Academy of Sciences – led by Ansley Coale – has investigated fertility determinants in developing countries. Several sample interviews have been carried out in different developing societies since World War II and the responses have been used as a national norm to provide a single figure for the ideal number of children per family and to highlight personal orientations. The results show that the ideal family size is linked more closely to fertility norms – often defined with respect to reference groups[4] – than to personal preferences (Clay and Zuiches 1980).

In this context, an extensive study on developing countries, edited by Bulatao and Lee (1983), suggests that prospective family-size desires are appropriate measures of fertility demand (McClelland 1983). A series of subsequent studies has found a high degree of correspondence between women's fertility preferences and subsequent contraceptive or fertility behaviour in many developing countries (e.g., Koenig et al. (2006) for India; Jayaraman, Mishra, and Arnold (2009) for many countries in South Asia; Amente, Tesfaye and Addise (2017) for Ethiopia; Bagheri, Abdolahi, and Saadati (2017) for Iran). Data on intended births are still fundamental for assessing the need for family planning services (Westoff and Bankole 2002).

The 'desired children' view (Pritchett 1994) assumes that high fertility in developing countries primarily reflects desired births and that couples are roughly able to achieve their fertility targets. This view is also held by most economists studying fertility behaviour. Becker (1991) argues that men's and women's fertility choices, which are conditioned and constrained by social, educational, cultural, and economic conditions, are the main determinants of actual fertility. In this framework, family planning is a response to changes in other fertility determinants rather than the cause of a decline in births.

In high-fertility societies, small but significant proportions of respondents do not provide a numerical response to questions about ideal family size, stating instead that the number of children they have is "up to God", thus accepting any potential number of children. These responses might reflect moral objections to, or lack of the possibility of, fertility control (Thomson 2015).

The demographic, political, and social trends discussed so far suggest three reasons why examining the ideal family size in Egypt is relevant.

[4] The concept of reference groups is introduced as a theoretically useful mechanism that disseminates collective norms and values regarding family size and the formation of the family size ideals of individual family members. The usual group to define and maintain norms in most developing countries is often represented by the social network in which most marriages occur (Bulatao and Lee 1983).

First, various studies on both developed and developing countries have found a close correlation between attitudes towards ideal family size and actual fertility patterns (e.g., Testa and Lutz 2005 and Penn and Lambert 2002 for European countries; Olenick 1998 for Tanzania).

Second, major changes in gender norms occurring during fertility transition affect family size, as shown by investigations of other MENA countries (Greulich, Dasre, and Inan 2016 for Turkey; Bagheri, Abdolahi, and Saadati 2017 for Iran). Indicators such as women's education, women's employment, age difference within couples, attitudes toward decision-making within the household, and tolerance of domestic violence against wives may shed light on the changes in couples' desired family size. In the literature, gender relations have been recognized as an important factor explaining fertility behaviour, especially in developing countries, where men often desire larger families than women (Bankole and Singh 1998; Olenick 1998; Snow, Winter, and Harlow 2013).

Data on the mean ideal family size in Egypt show substantial gender differences, with men desiring more children than women (Figure 1). Indeed, previous studies on developing countries have found that men's fertility aspirations come closer to actual fertility than women's aspirations (Bankole 1995; Moya, Snopkowski, and Sear 2016).

Third, for the first time, the Egyptian government is explicitly pointing to fertility decrease via reduction in the ideal family size. In the past, as stressed by Al Zalak and Goujon (2017), the authorities did not promote smaller families, implicitly accepting the (around) three-children family norm. This suggests the relevance of examining the factors influencing Egyptians' ideal family size in order to address the pressing policy issues in the country.

Our work investigates such factors by examining the desired family size by gender and by generation. In particular, it focuses on the relationship between fertility preferences, male and female gender-equitable attitudes, and female empowerment within the household.

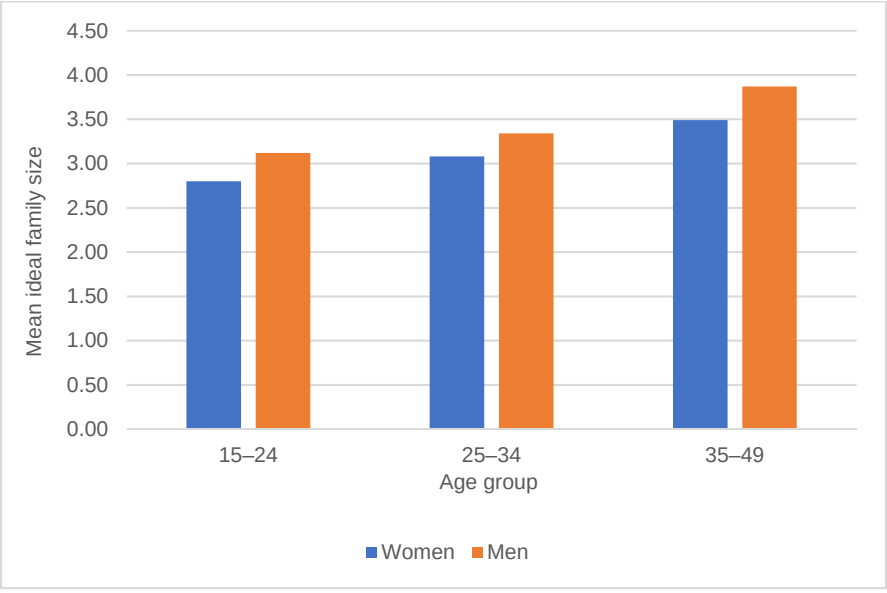
The paper is structured as follows. Section two presents both the total fertility rate and the evolution of the ideal number of children in Egypt, and section three explains our theoretical approach. Section four presents the multivariate analysis: using data from the 2015 Egypt Health Issues Survey (EHIS), we analyse the factors associated with the female and male ideal number of children. Section five presents the final results, and section six our discussion and conclusions.

2. Fertility and ideal number of children in Egypt

The analysis of fertility decline in Egypt shows an erratic trend from the 1950s to the mid-1980s when the transition finally started. The decrease in fertility in the second half

of the 1980s under Hosni Mubarak's presidency occurred during a period of decreasing oil prices and decreasing labour demand from the Gulf states (Fargues 1997). Fertility continued to decline up to the mid-1990s, a period when the neoliberal policies of structural adjustment involved reduction of both the civil service employment sector and financial assistance for education, health, and basic needs. Between 1995 and 2008 the total fertility rate (TFR) slowly declined from 3.6 to 3 children per woman. Surprisingly, according to the latest Demographic and Health Survey, over the period 2008–2014 the TFR rose from 3.0 to 3.5 children per woman.

Figure 1: Mean ideal family size by gender and age group as measured at the time of the survey, Egypt 2015



Source: Our elaboration on EHIS data. Means are calculated.

The increase in fertility concerned all women, regardless of their socioeconomic background. However, it was slightly higher for those from the middle class and those with medium and high educational levels (Table 1). Moreover, geographic differences can be observed: fertility fell in urban Governorates and rose in rural ones. For example, between 2008 and 2014 the TFR increased from 3.6 to 4.1 children per woman in rural

Upper Egypt,[5] while it remained unaltered at around 2.5 in urban Governorates. This fertility trend, especially in rural Governorates, is quite unusual for a country supposed to be experiencing the demographic transition stage of fertility decline (Bongaarts 2006; 2009).

It is important to highlight that fertility measurement errors can occur due to both sampling and non-sampling issues. Non-sampling errors cannot be avoided and are difficult to statistically evaluate. Sampling errors, however, can be estimated.

Table 1: Evolution of total fertility rate (TFR) and ideal number of children (INC) in Egypt by women's socioeconomic characteristics, 1988–2014

	1988		1992		1995		2000		2005		2008		2014	
	TFR	INC	TFR	INC	TFR	INC	TFR	INC	TFR	INC	TFR	INC	TFR	INC
Residence														
Urban	3.6	2.7	2.9	2.6	3	2.6	3.1	2.7	2.7	2.7	2.7	2.8	2.9	2.9
Rural	5.6	3.2	4.9	3.1	4.2	3.0	3.9	3.1	3.4	3.0	3.2	3.0	3.8	3.1
Education														
No education	5.6	3.1	5	3.1	4.6	3.1	4.1	3.3	3.8	3.8	3.4	3.3	3.8	3.3
Primary	4.4	2.8	3.9	2.9	3.5	2.9	3.8	3.1	3.4	3.6	3.2	3.1	3.6	3.2
Secondary	3.2	2.7	3	2.5	2.4	2.6	3.4	2.7	3.1	3.6	3.2	2.9	3.6	3.0
Higher	3.3	2.5	2.7	2.7	2.5	2.6	2.8	2.6	2.5	3	2.6	2.7	3	2.8
Wealth quintile														
Lowest	0		0		0		0		3.6	3.2	3.4	3.3	3.6	3.4
Second	0		0		0		0		3.3	3.0	3.1	3.1	3.6	3.2
Middle	0		0		0		0		3.3	2.9	3	2.9	3.9	2.9
Fourth	0		0		0		0		3	2.8	2.9	2.8	3.5	2.8
Highest	0		0		0		0		2.6	2.7	2.7	2.7	2.8	2.7
Total	4.5	2.9	3.9	2.9	3.6	2.8	3.5	2.9	3.1	2.9	3	2.9	3.5	3.0

Source: DHS, data on wealth index are available starting from 2005.

In the DHS, samples are quite large and usually number several thousands of respondents, thus leading to relatively small sampling errors in the TFR measurement of mid-transitional countries (Bongaarts 2006). In the Egyptian DHS the standard errors are usually around 0.04 births per woman.[6]

Although its demographic transition is still ongoing (even if mortality has declined), Egypt is considered a country with a rapidly evolving demographic structure. Factors such as cultural beliefs regarding the importance of marriage, family, and education, and the media and religious principles are all strong drivers of individual behaviour (Ambrosetti 2011; Engelhardt and Schulz 2017).

[5] Upper Egypt is the Egyptian region where the highest percentage of poverty has traditionally been recorded. Capmas data show that in 2019, 7 out of the 10 poorest governorates in Egypt were located in Upper Egypt (Samir 2019).

[6] In particular, it was 0.042 in 2008 and 0.039 in 2014, as shown in Ministry of Health and Population, El-Zanaty and Associates and ICF International 2015a.

While a slow increase in age at marriage has been observed since the 1980s, most recent data show a stable or reverse trend for younger birth cohorts, which may be a contributing factor to the increase in the country's fertility rate (Radovich et al. 2018).

Various explanations have emerged in the literature on the recent fertility increase.

First, Bongaarts (2003) outlines that the TFR declined in Egypt between 1990 and 2000, for all education groups. However, it has been suggested that the fertility decline observed in the early 2000s is related to the significant proportion of women with little or no education. However, the education gap in fertility has reduced over time, since the TFR decreased more rapidly for the lowest education group than for the highest. Bongaarts (2003) found that, in developing countries, educational differentials are slightly larger over the earlier than the later stages of the transition. Also, Bongaarts (2006; 2008) shows that fertility stalls are accompanied by a levelling off or sharp deceleration in both contraceptive use and demand as well as by a levelling off in fertility preferences.

Therefore, countries in which desired fertility has stalled well above the replacement level will require declines in preferences to complete their fertility transition. Such declines are usually achieved through improvements in socioeconomic conditions. Therefore, as broadly occurring in sub-Saharan African countries, in Egypt the high and nearly stable desired family size is an obstacle to further fertility decline (Bongaarts 2011).

Second, having more children may be an over-investment in future generations due to the economic issues characterising the country, a kind of "poverty-driven transition", as Courbage (2015a) suggests. Furthermore, high female unemployment rates, the fact that many women are underemployed or work in the informal and domestic economy (World Bank 2018), the declining activity of educated women, and declining employment opportunities for women, especially in the public sector, are all considered major factors in the rise of fertility (Courbage 2015b; Courbage and Puschmann 2015; Goujon and Alkitkat 2010; Assaad, Nazier, and Ramadan 2015; Krafft 2020).

Although recent research shows that the decline in public sector employment in Egypt contributed to the current stall and increase in fertility, it is unlikely to be its sole cause. The reduction in public sector employment opportunities has particularly damaged the career opportunities of vocational secondary graduates, who were traditionally employed in the sector, thus leading to a marked increase in their fertility (Krafft 2020). This finding may help to detect the reasons why fertility has been converging across educational levels (Radovich et al. 2018).

Third, changes in government policy have affected the recent fertility increase. The shortage of funding for family planning services affected the stall in fertility decline a few years before the 2011 revolution. In 2002, USAID funds for Asia and the Near East started to be redirected to Afghanistan, resulting in a 50% reduction in Egypt's family

planning budget over the period 2002–2007. In 2002 Egypt was already included in the group of USAID Global Health countries in the process of graduating.[7] As a result, USAID decided to withdraw contraceptive supply by 2007 and leave the health and population sector by 2011. In 2007, direct USAID funding to the national family planning (FP) programme ceased.

The recent increase in fertility has also been associated with a persistently high contraceptive discontinuation rate. After USAID withdrew, most of the FP projects were endorsed by the Egyptian Government, which became the largest provider of FP services. However, most FP projects ended or reduced their activities, thus causing a decrease in both clients' and providers' awareness of new FP methods (Abdel-Tawab, Oraby, and Bellows 2016; Robinson and El-Zanaty 2007). The family planning programme has also been negatively affected by the political changes that occurred after the 2011 Revolution, such as the increased strength of conservative groups and the advancement of the Muslim Brotherhood, which were associated with disrupted health services and reduced family planning resources (Radovich et al. 2018). President Mohamed Morsi (2012–2013) stated recurrently that Egypt's large population was an added value to be commended and encouraged, and this meant a reduction in government commitment to Family Planning during that period (Abdel-Tawab, Oraby, and Bellows 2016).

In recent years an increase has been observed in contraceptive use in Egypt, and this has been one of the main determinants of fertility transition. In 1974, 26.5% of Egyptian women used a traditional or modern contraceptive method and this figure increased in the following years. In particular, between 1988 and 2008 the percentage of married women using a contraceptive method rose from 38% to 60%. It plateaued after 2000 and stood at 59% in 2014 (Al Zalak and Goujon 2017).

At the same time, the proportion of women with an unmet need for contraception halved between 1992 (23%) and 2014 (12.6%), but no major signs of progress have been recorded since 2003. As for the method, the pill was the primary contraceptive method in Egypt before 1980, but its use progressively decreased:15.3% of women used the pill in 1988 and only 9.3% in 2003. In 2005 use of the pill started increasing to reach 16% in 2014. Nowadays, the most widely used method is the IUD, which is considered more effective than the pill and is distributed by family planning programmes. In particular, in 2014, 30% of women used the IUD as a contraceptive method. However, it is worth noting that very few Egyptian women use contraception before having their first child (0.1% in 2014).

[7] USAID criteria for country graduation are: (1) A total fertility rate less than or equal to 3.0. (2) A modern contraceptive prevalence rate of at least 50% or more of married women of reproductive age. (3) At least 70% of the population can access at least 3 FP methods within a reasonable distance. (4) No more than 30% of FP products, services, and programmes offered in the public and private sectors are subsidized by USAID. (5) Major service providers (public sector, NGO, commercial sector) generally meet and maintain standards of informed choice and quality of care.

Another important issue in the analysis of reproductive dynamics is the distinction between desired and unwanted fertility (Bongaarts 1990; Casterline and El-Zeini 2007). Most often the primary reason for stalled or increased fertility levels is unwanted fertility due to a lack of sufficient family planning services. In Egypt between 1988 and 2005 unwanted fertility fell sharply from 0.9 to 0.2 children, but rose to 0.7 in 2014. Desired fertility, on the other hand, declined sharply between 1988 and 1995 and between 2000 and 2008, while in 2014 almost the same value as 1988 was reached (3 and 2.8 children respectively) (ICF 2015). This suggests that there was only a slight change in the desired family size in that period. Between 1988 and 2000 the level of desired fertility was close to the ideal family size, which was stable at around 3 children per woman. However, between 2000 and 2008 desired fertility decreased to 2.3 children per woman, increasing again to 2.8 in 2014, following the same pattern of TFR.

Hence, the rise in fertility between 2008 and 2014 may be attributed to both unwanted and desired fertility (0.7 children per woman for both). By analysing data from the 2014 EDHS, the Ministry of Health and Population, El-Zanaty and Associates and ICF International (2015b) formulated a hypothesis on the elimination of the actual gap between TFR and desired fertility. They stated that the elimination of unwanted fertility would cancel the gap, thus leading to a reduction in TFR by 20%. However, even with the elimination, the fertility rate would be above the 0.7 children of the replacement level. In this context, policies to reduce fertility should focus on both unwanted and desired fertility (Social Research Center 2012; Mohamed et al. 2019).

The recent increase in desired fertility (Krafft 2020; Ministry of Health and Population, El-Zanaty and Associates, and ICF International 2015b) needs further investigation. Indeed, studying the ideal family size may help to identify the causes of the rise in fertility in Egypt. The data in Table 1 show that during the period 1988–2014 the ideal number of children was stable at around 3 children (Ambrosetti, Angeli, and Novelli 2019; Eltigani 2003; 2009). Moreover, there were no important differences by women's characteristics (the most striking differences being by age, place of residence, and wealth).

Traditionally, the mean ideal number of children has been higher for women in rural areas than for those in urban districts. Both Cochrane, Khan, and Osheba (1990) (who used EFS data) and Baschieri (2007) (who used EDHS data) found a strong impact of place of residence. Women with at least secondary education who worked for cash and whose households were in the middle to highest wealth quintiles had the lowest ideal number of children.

The comparison between 2008 and 2014 highlights important changes in the fertility pattern: the ideal number of children increased for educated women (from primary to higher education) and for those in the poorest (first and second) quintiles. Recent data confirm that almost all young Egyptians aged 15–29 intend to have children (Sieverding

and Elbadawy 2010). For about 75% of young women, the ideal number of children is two or three. However, the reported figures are generally slightly higher for women in rural areas and in Upper Egypt, as well as for those with less education and lower economic status. Moreover, data from Egyptian surveys outline the influence of the woman's family of origin having traditional values (Gebel and Heyne 2014).

Ambrosetti, Angeli, and Novelli (2019) used 2008 and 2014 EDHS data and 2015 EHIS data and showed a persistent high ideal number of children for younger cohorts. Furthermore, by comparing data from the 2008 and 2015 surveys, the authors found that the ideal number of children differed noticeably, with a consistent shift towards larger ideal families in that period. An overall increase in the number of men and women desiring a larger family emerges, regardless of their education and place of residence. There has been a general rise from 2 to 3 desired children, thus confirming a reverse trend for the youngest generations also.

3. Explaining ideal family size and fertility: A theoretical approach

The debate on fertility ideals began in the 1960s in the United States (Blake 1966). In the various fertility surveys carried out in the following decades, respondents (usually women) have frequently been asked their opinion on the ideal family size (Bongaarts 2001). Stability and change in women's expectations of future births have been studied both for population-projecting issues and to understand women's attitudes regarding their future fertility (Penn and Lambert 2002; Sobotka and Beaujouan 2014; Westoff 2010; Freedman, Freedman, and Thornton 1980).

Debate on the best approach to the study of fertility ideals is still open: the concept itself does not offer a sole interpretation (Blake 1966; Ryder and Westoff 1969; Philipov and Bernardi 2012; Sobotka and Beaujouan 2014). Discussion has arisen about household versus individual demand, i.e., whether measures of one spouse's (usually the wife's) family-size desires do in fact reflect the household demand (McClelland 1983). Moreover, some researchers have suggested that the relationship between fertility behaviour and family-size desires may be post-hoc rationalisation of actual fertility in both developed and developing countries (Bongaarts 2001, 2003; Bhat and Zavier 2003). Intended births reflect the combined effect of fertility demand and contextual constraints on the achievement of desired fertility (McClelland 1983; Thomson and Brandreth 1995).

Previous studies on both developed and developing countries have identified various personal and societal factors to be accounted for when exploring differences and trends in the ideal number of children; e.g., cultural factors, education, urbanisation (Kirk 1996; Dyson and Moore 1983), the circulation of new ideas about fertility control (Cleland and Wilson 1987; Bongaarts and Casterline 2018), trends in actual fertility, family influences,

childbearing experience of the older generations (Axinn, Clarkberg, and Thornton 1994; Testa and Grilli 2006), and the desired gender balance for children (Bongaarts 2001; Yount, Langsten, and Hill 2001).

Data on the ideal family size may be useful for understanding the social fertility norms that are evolving together with major societal changes (Trent 1980; Sobotka and Beaujouan 2014; Philipov and Bernardi 2012; Goldstein, Lutz, and Testa 2003; Hagewen and Morgan 2005). Thomson (2015) argues that changes in ideal family size may emerge at the individual level, but since they indicate changes in social norms their role at the societal level needs to be taken into account (Mason 1983).

Ideal family size may be a useful general indicator of the degree of societal pronatalism (Trent 1980). As Girard and Russell (1982) assert, a collective image reflecting a shared norm and influencing people's behaviour cannot be thought of as the expression of individual wishes or desires. The estimate of the average ideal/desired family size (number of children) is widely used in most demographic analyses, although potential biases can result due to non-response and rationalisation.

4. Adopting a gender perspective

Previous studies have highlighted the importance of a gender perspective, as changing ideals regarding family size in developing countries have been associated with societal changes characterising demographic transition (Jejeebhoy 1995; Snow, Winter, and Harlow 2013). In numerous studies, women's status has been recognized as one of the key determinants of fertility (Krafft 2020; McDonald 2000a; 2000b). Empowerment[8] is the process through which women acquire enabling resources, like education, which may improve their agency, or the ability to define strategic life choices in an evolving social context and gain greater control over their circumstances (Kabeer 1999; Sen and Batliwala 2000; Yount et al. 2016; Samari 2019). Therefore, policies promoting women's empowerment seem to be the most important channels to achieve the fertility reduction needed to slow down population growth (Pritchett 1994; Mason 1983).

Several studies have tried to disentangle the relationship between women's empowerment and actual and ideal fertility in developing countries. In particular, it has been found that employed women as well as those with high education and high agency experience a higher opportunity cost of having children compared with others; as a result,

[8] An increasing body of literature includes efforts to define the concept of empowerment. In this paper we do not enter into this discussion and only include the most useful and widely accepted definitions. A review of the literature on female empowerment and fertility can be seen in Upadhyay et al. 2014. With regard to the individual, household, wealth, and location factors determining Egyptian women's empowerment, see Assaad, Nazier, and Ramadan 2015; Nazier and Ramadan 2018.

the ideal number of children decreases for these women (Mason and Taj 1987; Rindfuss and Brewster 1996). Education, especially female education, emerges as a fundamental factor in fertility transition as it affects gender norms and makes women more autonomous (Dyson and Moore 1983). An increase in women's educational level has usually been found to be associated with lower fertility preferences (Brewster and Rindfuss 2000; Bongaarts 2003; Larsen and Hollos 2003). Male education and more broadly male characteristics also have an effect in terms of fertility reduction (albeit less clear than in the case of women's education), since marriage and reproductive choices should be taken by men and women jointly. Women's changing behaviour and attitudes toward marriage and the family are accompanied by changes in men's behaviour about the same issues (Basu 1999).

Gender differences in reproductive goals may shed light on the fertility transition mechanism at both the individual and the societal level. For example, while gender differences may not be significant for married women and men, important differences could emerge when unmarried young women and men are asked the same question (Mason and Taj 1987). Such differences may simply be related to differences in age at marriage, as women marry at younger ages than men in developing countries. Gender relations and gender values systems have long been conceptualised as major determinants of attitudes regarding fertility, even if in the literature the role played by other contextual factors emerges.

In the Egyptian context, for instance, El-Zeini (2008) found that – together with other factors such as son preference and optimistic economic expectations – discriminatory gender attitudes were associated with a weak preference for and ambivalence towards having only two children.

While education and labour market participation have traditionally been used to measure women's empowerment, they cannot reflect specific domains of such empowerment, e.g., each partner's decision power within the couple. Variables such as women's decisions regarding personal healthcare, major household purchases, what to do with the money their husbands earn, and their freedom of movement are increasingly used as objective measures of women's household level of empowerment (Kishor and Subaiya 2005; Upadhyay and Karasek 2012; Upadhyay et al. 2014).[9]

In Egypt, and more broadly in the MENA area, several studies have attempted to evaluate women's empowerment or attitude towards empowerment, and its impact on demographic, social, or health behaviours. These studies have generally focused on decision-making autonomy and physical autonomy through the analysis of women's involvement in the decision-making process at the household level. Afifi (2007; 2009) states that Egyptian women disempowered in any of the multi-dimensional aspects of

[9] Some papers included decisions in which the woman has some say (joint or sole decision-making), while others considered only those decisions in which the woman has the final say.

autonomy are helpless when it comes to arriving at their own reproductive choices concerning family size and formation. This finding is consistent with previous studies in other Arab countries – for instance, in Oman, where disempowerment predicted serious unmet need for modern family planning methods (Afifi 2007).

However, the findings from other studies carried out in the Egyptian context do not corroborate this connection; for instance, Samari (2017) found that women with more agency (measured on the basis of autonomous or joint decisions within the household, greater mobility, and financial autonomy) have more children than less autonomous women.

Given this framework, we aim to answer the following research questions while controlling for generation, marital status, and parity:

(Q1) Do gender-equitable attitudes have different impacts on the ideal number of children of women and men?

(Q2) Does women's empowerment lead to a lower ideal number of children?

5. Multivariate analysis

5.1 Data

We use data from the 2015 Egypt Health Issues Survey (EHIS) – collected by El-Zanaty and Associates on behalf of the Egyptian Ministry of Health and Population in 2015 – which gives innovative evidence on the ideal number of children for both married and unmarried females and males aged 15–49 years in the context of a developing country.

As illustrated in the final report (Ministry of Health and Population, El-Zanaty and Associates and ICF International 2015b: 121–125), the 2015 EHIS took advantage of the sample developed for the ever-married-women survey component of the 2014 EDHS. For the 2015 EHIS, a sub-sample of 614 primary sampling units (PSU) was selected from the 842 PSUs included in the 2014 EDHS sample. A total of 7,656 households were chosen from the 2014 EDHS listings; thus, the EDHS and the EHIS household samples were independent; i.e., no household was included in both samples.[10]

The 2015 EHIS contains three questionnaires: a household questionnaire, an adult questionnaire for eligible individuals aged 15–59 years, and a child questionnaire for

[10] Concerning sample weights, like the 2014 EDHS sample from which it was derived, the 2015 EHIS sample is a four-stage stratified cluster sample. The sampling weights were calculated based on sampling probabilities separately for each sampling stage and for each cluster (segment). The final sampling weights were normalised so that the total number of weighted cases at the national level, for both household and individual respondents, respectively, is equal to the number of unweighted cases.

eligible individuals aged 6 months–14 years. The adult questionnaire includes questions on reproductive health and family planning knowledge and attitudes, as well as questions on fertility and gender-equitable attitudes. For the first time in Egypt, both married and unmarried women and men aged 15–59 years were asked to respond to such questions, thus providing unprecedented insight regarding men and never-married individuals who were not usually included in Egypt DHS surveys (which mostly focus on ever-married women).

Information concerning several topics related to current fertility behaviour in Egypt, including ideal family size,[11] is presented with regard to all women and men aged 15–49. Our final sample of successfully interviewed individuals aged 15–49 numbers 7,905 females and 6,315 males.

5.2 Methods

Since our outcome variable, the ideal number of children, is defined on a discrete and non-negative support, (namely, it takes only non-negative integer values, like e.g. 0,1,2,...), we employed a count regression model. More specifically, we used Poisson regressions to model determinants of ideal numbers of children for women and men.[12]

To answer our research questions (Q1, Q2), we ran three different models: Model 1, comprising never-married and ever-married men and women aged 15–49, where we explore differences in ideal numbers of children by age, marital status, gender, and gender attitudes (Q1); Model 2, comprising ever-married men and women aged 15–49, where we explore differences in ideal numbers of children by age, gender, gender attitudes and parity (Q1); and Model 3, comprising currently married women aged 15–49, where we add three empowerment indicators to assess whether women's empowerment is related to the ideal number of children (Q2).

5.3 Dependent variable

Ideal number of children: We use men's and women's ideal number of children as the dependent variable; this variable has been widely used as a measure of fertility aspirations (Woldemicael 2009; Upadhyay and Karasek 2012; Westoff 2010). As explicitly

[11] Previously, similar questions had been put to young people aged 10–29 years through the Survey of Young People in Egypt (SYPE), conducted in 2009 and 2014 by the Population Council.

[12] Alternative model specifications were considered, namely the Negative Binomial regression model and Gaussian linear model on log-transformed data. Results from likelihood ratio tests and information criteria suggest that the Poisson regression model is preferred.

mentioned in the EHIS final report, "To better understand the childbearing preferences that may be contributing to the rise in fertility, the 2015 EHIS included a question to ascertain a respondent's ideal number of children" (Ministry of Health and Population, El-Zanaty and Associates and ICF International 2015b: 87). The question was formulated differently for already married or never-married men and women.[13] Ever-married men and women were asked: "If you could go back to the time before you married and could choose exactly the number of children to have in your whole life, how many would that be?" For never-married/signed contract men and women,[14] the question was phrased: "If you could choose exactly the number of children to have in your whole life, how many would that be?" The question required respondents to carry out the difficult task of considering the number of children they would wish to have in their lifetime without considering the number (if any) they already had.

Both questions can have non-numeric responses, such as "As God wills". In the 2015 EHIS, only 0.2% of women and 0.6% of men believed fertility to be determined by God;[15] given the negligible number of non-numerical responses, we did not include these cases in our analysis.

5.4 Explanatory variables

The explanatory variables in Models 1–2 are respondents' attitudes towards wife beating, exposure to mass media, and exposure to family planning messages. Gender attitudes were operationalised by a binary measure, summing up a series of five items regarding the possibility that wife beating by the husband was justified in certain situations. Respondents were asked: "In your opinion, is a husband justified in hitting or beating his wife in the following situations?" The five different items (each with Y/N DK answer possibilities) were: "If she goes out without telling him", "If she neglects the children", "If she argues with him", "If she refuses to have sex with him", "If she burns the food". We created a dichotomic variable comparing those who did not agree with any of the five scenarios (coded 0) with those who agreed with at least one justification for wife beating (coded 1). We coded the response "Don't know" as YES, assuming in this response a tolerant attitude towards wife beating.

Exposure to mass media was investigated with a series of six items. Men and women were asked how often they read a newspaper or magazine, listen to the radio, watch

[13] Question number 710 in the survey.
[14] In Egypt, Muslim couples may be contractually married weeks or months before the wedding (Ambrosetti 2011).
[15] Non-numeric responses in analyses of desired family size can represent a potential source of bias. A full discussion about the treatment of these cases can be found in Olaleye (1993); Westoff (2010); Bongaarts (2011); Upadhyay and Karasek (2012).

television, use a computer, access the internet, and access social media. The possible answers were "at least once a week", "less than once a week", "not at all". We created a dichotomic variable comparing those who were never exposed to media (coded as 0) with those who were exposed to at least one mass medium at least once a week (coded as 1).

To assess exposure to family planning messages, men and women were asked the following questions: "During the past 6 months have you heard about family planning on the radio? On the television? In a newspaper or magazine? On a poster, billboard, or sign? At a community meeting? From a religious leader?" The possible answers to each of the six questions were Y/N DK. As a summary measure of exposure to family planning messages, we created a dichotomic variable comparing those who were never exposed to family planning messages (coded as 0) with those who had been exposed to at least one family planning message during the last 6 months (coded as 1).

In Model 3, we considered women's empowerment as a multi-dimensional factor: it was operationalised with several indicators such as women's education, employment, attitudes, and agency. Therefore, in addition to the covariates used in the previous models, we added the questions (directed at currently married women only) most commonly used to measure women's agency in studies based on DHS surveys. The questions are intended to capture instrumental agency or power within households; i.e., whether women have a say in decisions, or who makes the different types of decisions in the household (Samari 2019). More specifically, we added the following covariates to Model 2a: "Who usually makes decisions about making major household purchases?" "Who usually makes decisions about your health care?" "Who usually makes decisions about visits to your family or relatives?" For each of these questions, the four response options were: husband alone, someone else, respondent jointly with husband, respondent alone. We created three variables including women's contribution to household decision-making (jointly with husband, sole decision-making, husband alone, or someone else).

5.5 Control variables

For control variables we used covariates that account for the most important demographic and socioeconomic characteristics of women and men. Of the demographic characteristics, we considered age group (young (15–24), adult cohorts (25–34), and older cohorts (35–49)), marital status (never married/ever married), number of living children, and family size. The number of living children is important since it may be subject to ex-post rationalisation of adults who already have children (Bhushan and Hill 1996). To account for this bias, we adjusted for parity in our models. In Model 1, where we also considered never-married men and women, we used family size instead of the number of living children. We assumed that those living in larger families (for the

youngest generally the family of origin) may have more traditional behaviours than those who live in smaller families, and thus the desire for a larger family (Régnier-Loilier and Depledge 2006; Hayford 2009). Among socioeconomic variables, we included educational level, as represented by educational attainment (low: no education and incomplete primary; medium: complete primary and incomplete secondary; high: complete secondary and higher)[16]; type of residence (urban/rural), place of residence (four major subdivisions: Urban Governorates, Lower Egypt, Upper Egypt, Frontier Governorates), working status in the last seven days prior to the survey (working for cash, not working for cash, not working), the household wealth quintile (measured with a composite wealth index, available in the original dataset, based on household-level data concerning the household's assets, services, and amenities, ranging from lowest to highest) to represent the economic situation of the household, and religion (Muslim, Christian, or other).

6. Results

6.1 Descriptive statistics

Figure 1 and Table 2 show the descriptive characteristics of men and women. Regarding the mean ideal family size by age group and gender, substantial differences between men and women and across cohorts are observed. In particular, men desire more children than women, and younger cohorts report a lower ideal family size than older ones.

About 76% of women in the sample are ever married versus 58% of men. About half of the sample live in urban environments, almost 95% of both men and women are Muslim, 57.2% of men and 49.4% of women have completed secondary or higher education, and about 80% of men and only 13.4% of women are working for cash.

Exposure to mass media is almost universal for both women and men, while exposure to family planning messages is higher for men than for women (80.6% compared to 70%). Both men and women are fairly evenly distributed across the wealth quintiles.

Moreover, Table 3 confirms clear differences by place of residence, both in the TFR in 2014 and in the mean ideal number of children for women and men aged 15–49 in 2015. In all geographic areas of the country, men's mean ideal number of children is higher than women's and, except for in the Urban Governorates, it is closer to the level of TFR measured in the 2014 EDHS.

[16] Unfortunately, the EHIS survey does not include information on spouse's education.

Table 2: Descriptive statistics of the sample of 6,315 males and 7,905 females: % or mean and standard deviation (in brackets)

	Women	Men	TOT
Age group (%)			
15–24	32.8	33.9	33.3
25–34	34.0	30.5	32.5
35–49	33.2	35.6	34.2
Ideal number of children (mean)	3.1 (1.3)	3.5 (1.9)	3.3 (1.6)
Marital Status (%):			
Never-Married	24.4	41.8	32.1
Ever-Married	75.6	58.2	67.9
Number of living children (mean)	2.0 (1.8)	1.5 (1.7)	1.8 (1.8)
Size of the Family (mean)	5.3 (2.1)	5.2 (2.1)	5.2 (2.1)
Place of residence (%):			
Urban Governorates	16.9	17.9	17.4
Lower Egypt	36.5	36.3	36.4
Upper Egypt	40.3	38.9	39.7
Frontier Governorates	6.2	6.9	6.5
Type of residence (%):			
Urban	47.2	49.6	48.3
Rural	52.8	50.4	51.7
Religion (%):			
Muslim	94.8	95.0	94.9
Other	5.2	5.0	5.1
Educational Level (%):			
Low	22.9	12.8	18.4
Medium	27.7	30.1	28.7
High	49.4	57.2	52.9
Working status (%):			
Not working / not working for cash	86.6	20.2	57.1
Working for cash	13.4	79.8	42.9
Exposure to mass media (%):			
Never	.4	.5	.4
At least one mass media at least once per week	99.6	99.5	99.6
Exposure to family planning messages (%):			
NO	69.7	80.6	74.5
YES	30.3	19.5	25.5
Tolerance for wife beating (%):			
No to all 5 items	72.2	67.1	69.9
Yes for at least 1 item	27.8	32.9	30.1
Wealth Index	–0.19 (10.23)	–0.29 (10.40)	–0.23 (10.31)
Number of cases	7,905	6,315	14,220

Source: Authors' elaborations on EHIS 2015 data.

Table 3: Total fertility rate (TFR) and mean ideal number of children (INC) by gender and place of residence, Egypt 2014–2015

	TFR 2014	INC 2015	
		Women	Men
Place of Residence			
Urban Governorates	2.5	2.8	3.0
Lower Egypt	3.4	3.0	3.2
Urban	3.0	2.8	3.1
Rural	3.6	3.0	3.2
Upper Egypt	3.8	3.3	3.7
Urban	3.2	3.0	3.5
Rural	4.1	3.4	3.9
Frontier Governorates	3.9	3.2	3.9
Total	3.5	3.1	3.4

Source: EDHS 2014 for TFR; EHIS 2015 for INC.

6.2 Multivariate analysis

Table 4 presents the results from Model 1, where we tested whether gender-equitable attitudes have different associations with the ideal number of children for ever- and never-married women and men, controlling for generation, marital status, and parity (Q1).

Traditional gender attitudes (expressed by the justification of at least one reason for wife beating) are positively associated with larger ideal numbers of children for both genders and with a higher coefficient for men. Moreover, exposure to mass media shows a negative association with the ideal number of children for both genders, with a more pronounced association for women. Lastly, exposure to family planning messages does not show any association with the ideal number of children.

A higher female ideal number of children is negatively associated with a high wealth index (good socioeconomic status).

For both men and women, the desire to have a large family is positively associated with being aged 25–34 or 35–49, being married, working for cash, being Muslim, living in a large household, living in any rural environment (rather than urban areas), and with living in Upper Egypt or Frontier Governorates (rather than Urban Governorates).

The results confirm the importance of education: An increase in women's and men's level of education is associated with lower fertility preferences.

Table 4: Model 1: Poisson regression coefficients. Dependent variable: ideal number of children by gender, ever-married and never-married women and men

Variable	Women	Men
Number of household members	0.019 [0.000]	0.021 [0.000]
	(0.003)	(0.003)
Age group (ref. 15–24)		
25–34	0.037 [0.068]	0.019 [0.389]
	(0.020)	(0.025)
35–49	0.166 [0.000]	0.126 [0.000]
	(0.020)	(0.022)
Marital status (ref. never-married)		
Ever-married	0.055 [0.001]	0.080 [0.000]
	(0.020)	(0.022)
Working status (ref. Not working / not working for cash)		
Working for cash	0.081 [0.000]	0.087 [0.000]
	(0.013)	(0.015)
Education (ref. no education + incomplete primary)		
Complete primary + incomplete secondary	–0.014 [0.476]	–0.045 [0.047]
	(0.020)	(0.022)
Secondary and higher	–0.022 [0.219]	–0.047 [0.018]
	(0.018)	(0.020)
Place of residence: (ref. urban Governorates)		
Lower Egypt	–0.014 [0.512]	–0.014 [0.567]
	(0.022)	(0.024)
Upper Egypt	0.132 [0.000]	0.125 [0.000]
	(0.022)	(0.024)
Frontier Governorates	0.108 [0.000]	0.182 [0.000]
	(0.030)	(0.032)
Type of residence: (ref. urban)		
rural	0.083 [0.000]	0.054 [0.002]
	(0.015)	(0.017)
Wealth index	–0.212 [0.001]	–0.170 [0.019]
	(0.065)	(0.072)

Table 4: (Continued)

Variable	Women	Men
Religion (ref. Muslim)		
Other than Muslim	–0.117 [0.000]	–0.142 [0.000]
	(0.030)	(0.034)
Exposure to family planning messages: (ref. not exposed)	–0.003 [0.834]	0.008 [0.631]
	(0.015)	(0.017)
Exposure to mass media: (ref. never exposed)	–0.193 [0.017]	–0.014 [0.904]
	(0.015)	(0.115)
Tolerance for wife beating: (ref. 'No' to all 5 items)	0.083 [0.000]	0.064 [0.000]
	(0.014)	(0.016)
Constant	1.031 [0.000]	0.871 [0.000]
	(0.086)	(0.118)
Observations	7,779	6,204
Log Likelihood	–13,821.47	–10,971.78
Akaike Inf. Crit.	27,677	23,100

Note: Standard errors in brackets ( ) and p-values in square brackets [ ].

As men and women may adjust their fertility preference according to how many children they already have, we run the following analysis only for ever-married women and men, replacing the covariate 'Number of household members' with the covariate 'Number of living children' in order to take into account the association between the actual number of living children and the ideal number of children. Moreover, considering the ex post rationalisation issues related to the number of living children, we have estimated models with (2a) and without (2b) this variable. Model 2a (Table 5) shows the association of both the number of living children and individual socioeconomic and demographic variables with desired fertility as in Model 1. Model 2b was re-estimated without controlling for the number of living children – as proposed by Baschieri (2007) – to explore whether the effect of socioeconomic variables at the individual level changes and thereby to see to what extent the individual-level effect of those variables is captured by the effect of the number of children.

In both models, a positive relationship between desired fertility and the justification of at least one reason for wife beating emerged. Interestingly, exposure to mass media shows a negative association with the ideal number of children only for women, while exposure to family planning messages does not show any association with the ideal number of children.

The results of Model 2a differ in part from those of Model 1, which also takes into account unmarried men and women: in particular, the youngest women and men (age 15–24) have higher ideal numbers of children compared to the age group 25–34. When the individual variables model has been re-estimated without controlling for the number of living children (Model 2b), it seems that the effect of higher education at the individual level (for both women and men) is captured by the effect of the number of living children. Therefore, as for the effect of education, the results of Model 2b confirm the findings of Model 1.[17]

Table 5: Model 2: Poisson regression coefficients. Dependent variable: ideal number of children by gender, ever-married women and men aged 15–49. Model 2a: among explicative variables the number of living children; Model 2b: re-estimated without the number of living children

Variable	Model 2a		Model 2b	
	Women	Men	Women	Men
Number of living children	0.092 [0.000]	0.086 [0.000]	–	–
	(0.006)	(0.006)	–	–
Age group (ref 15–24)				
25–34	–0.058 [0.040]	–0.040 [0.203]	0.066 [0.015]	0.073 [0.015]
	(0.028)	(0.031)	(0.027)	(0.030)
35–49	–0.040 [0.190]	–0.006 [0.855]	0.189 [0.000]	0.207 [0.000]
	(0.031)	(0.034)	(0.027)	(0.030)
Working status (ref no-cash cash and kind only)				
Working for cash	0.146 [0.000]	0.078 [0.000]	0.110 [0.000]	0.045 [0.011]
	(0.016)	(0.018)	(0.016)	(0.018)
Education (ref no education + incomplete primary)				
Complete primary + incomplete secondary	0.019 [0.403]	–0.016 [0.000]	–0.010 [0.652]	–0.039 [0.135]
	(0.023)	(0.002)	(0.023)	(0.026)
Secondary and higher	0.006 [0.729]	–0.017 [0.460]	–0.041 [0.039]	–0.058 [0.009]
	(0.020)	(0.023)	(0.020)	(0.022)
Place of residence: Ref (urban Governorate)				
Lower Egypt	–0.031 [0.237]	–0.006 [0.849]	–0.036 [0.710]	–0.022 [0.451]
	(0.026)	(0.029)	(0.026)	(0.029)
Upper Egypt	0.109 [0.000]	0.116 [0.000]	0.133 [0.000]	0.131 [0.000]
	(0.026)	(0.029)	(0.026)	(0.029)
Frontier	0.083 [0.018]	0.132 [0.001]	0.113 [0.001]	0.150 [0.000]
	(0.035)	(0.021)	(0.035)	(0.039)
Type of residence: (ref urban)				
Rural	0.064 [0.000]	0.036 [0.084]	0.085 [0.000]	0.064 [0.002]
	(0.018)	(0.021)	(0.018)	(0.020)
Wealth index	–0.159 [0.043]	–0.228 [0.007]	–0.247 [0.002]	–0.322 [0.000]
	(0.079)	(0.084)	(0.078)	(0.084)

[17] In order to further disentangle the complex relationship between ideal family size and individual characteristics, we have conducted an analysis separated by sex and parity whose results confirm those presented here and are available upon request.

Table 5: (Continued)

Variable	Model 2a		Model 2b	
	Women	Men	Women	Men
Religion (ref Muslim)				
Other	–0.110 [0.002]	–0.126 [0.002]	–0.142 [0.000]	–0.160 [0.000]
	(0.036)	(0.042)	(0.036)	(0.042)
Exposure to family planning messages: (ref not exp)	–0.015 [0.379]	0.021 [0.251]	–0.010 [0.560]	0.030 [0.106]
	(0.017)	(0.018)	(0.017)	(0.018)
Exposure to mass media: (ref-never)	–0.251 [0.009]	0.010 [0.936]	–0.245 [0.011]	0.014 [0.910]
	(0.096)	(0.119)	(0.096)	(0.119)
Tolerance for wife beating: (ref- 'No' to all 5 items)	0.059 [0.000]	0.048 [0.010]	0.071 [0.000]	0.058 [0.002]
	(0.017)	(0.01)	(0.017)	(0.019)
Constant	1.116 [0.000]	0.881 [0.000]	1.223 [0.000]	0.984 [0.000]
	(0.102)	(0.124)	(0.102)	(0.123)
Observations	5,869	3,608	5,869	3,608
Log Likelihood	–9,481.894	–7,501.134	–9,609.900	–7,591.376
Akaike Inf. Crit.	18,996	15,034	19,250	15,213

Note: Standard errors in brackets ( ) and p-values in square brackets [ ].

Table 6: Model 3a, 3b: Poisson regression coefficients. Dependent variable: ideal number of children for currently married women (including women's empowerment indicators)

Variable	Model 3a	Model 3b
Who usually makes decisions about making major household purchases? (ref. husband, alone, someone else)		
Respondent jointly with husband	–0.028 [0.192]	–0.028 [0.204]
	(0.021)	(0.022)
Respondent makes the decision	0.041 [0.181]	0.004 [0.895]
	(0.031)	(0.032)
Who usually makes decisions about visits to your family or relative? (ref. husband alone, someone else)		
Respondent jointly with husband	–0.080 [0.001]	–0.044 [0.061]
	(0.023)	(0.024)
Respondent makes the decision	–0.007 [0.810]	0.008 [0.785]
	(0.029)	(0.029)
Who usually makes decisions about your healthcare? (ref. husband alone, someone else)		
Respondent jointly with husband	–0.027 [0.294]	0.007 [0.781]
	(0.026)	(0.026)
Respondent makes the decision	–0.036 [0.232]	0.008 [0.799]
	(0.030)	(0.031)
Number of living children		0.076 [0.000]
		(0.006)

Table 6: (Continued)

Variable	Model 3a	Model 3b
Age group (ref. 15–24)		
25–34		–0.041 [0.091]
		(0.024)
35–49		0.005 [0.842]
		(0.028)
Working status (ref. no-cash cash and kind only)		
Working for cash		0.033 [0.163]
		(0.023)
Education (ref, no education + incomplete primary)		
Complete primary + incomplete secondary		0.006 [0.779]
		(0.023)
Secondary and higher		–0.015 [0.467]
		(0.020)
Place of residence: Ref. Urban Gov.)		
Lower Egypt		–0.028 [0.287]
		(0.027)
Upper Egypt		0.083 [0.002]
		(0.027)
Frontier		0.077 [0.034]
		(0.037)
Type of residence: (ref. urban)		
rural		0.067 [0.000]
		(0.019)
Wealth index		–0.142 [0.069]
		(0.078)
Religion (ref. Muslim)		
Other		–0.084 [0.018]
		(0.036)
Exposure to family planning messages: (ref. not exposed)		0.009 [0.561]
		(0.016)
Exposure to mass media: (ref. never)		–0.062 [0.588]
		(0.114)
Tolerance for wife beating: (ref. 'No' to all 5 items)		0.015 [0.379]
		(0.017)
Constant	1.271 [0.000]	1.016 [0.000]
	(0.021)	(0.120)
Observations	5,483	5,479
Log Likelihood	–9,627.997	–9,400.828
Akaike Inf. Crit.	19,270	18,846

Note: standard errors in brackets ( ) and p-values in square brackets [ ].

To answer our second research question (Q2) on the relationship between women's empowerment and ideal number of children, we estimated Model 3 by including in our analysis only currently married women and by adding the three above-mentioned variables measuring women's opportunities for decision-making (Table 6).

Model 3a contains variables measuring female participation in household and health decision-making and mobility only, while Model 3b – the full model – contains all the covariates already included in Model 2a. Not all the dimensions of women's empowerment and autonomy seem to be important predictors of ideal fertility; we found an evident and negative relationship only for currently married women usually involved in decision-making processes on visits to their families or relatives (Model 3a). When adding those 3 covariates to Model 2a for women, we found no clear patterns relating to the effect of education, employment, and gender attitudes on ideal number of children. Besides, in our final Model (3b) the results showed that women having some say about decisions to visit their family or relatives have lower ideal numbers of children than women who stated that their husbands (or others) had all the decision-making power.

7. Discussion and conclusions

Our work contributes to the existing literature on fertility in two important ways.

First, the majority of studies that explain fertility intentions for both men and women focus on developed countries. To date this approach has received little attention in studies on developing countries, overlooking the role of men in fertility decisions. Egypt is a particularly relevant case study as it has experienced an increase in fertility in recent years.

Second, investigations on ideal family size in developing countries from a gender perspective carried out to date have been scarce. In our paper we tried to fill this gap by analysing the factors affecting the ideal number of children in Egypt and considering, for the first time in the Egyptian context, both men and women of the reproductive age group. We examined male and female gender-equitable attitudes and women's empowerment.

However, we were unable to compare men and women as couples, given the lack of information on the households' decision-making process concerning childbearing. Indeed, the EHIS survey does not provide information on couples of the same household.

Other limitations of our study are the following.

First, the question about the ideal number of children is biased because most of the respondents already had children, and this may have discouraged both men and women from reporting an ideal family size smaller than their current number of living children. This is particularly true for older men and women with many living children. To partially account for this bias, we adjusted for parity in all models.

Second, we cannot exclude reverse causality between the studied variables, given the cross-sectional structure of the data, which limits the interpretation of the mechanisms and direction of association (Mason 1987; Samari 2017). The use of longitudinal data could shed light on the causality between variables, but longitudinal data are still scant.

Our analyses present some important findings. Regarding differences in fertility intentions by generation, marital status, parity, and gender, we found that when considering both married and never-married men and women, being married is positively associated with high ideal numbers of children, and both men and women of younger generations have lower ideal numbers of children only when never-married individuals are taken into account. The number of household members is important when also including unmarried men and women – generally the youngest in the survey – in the analysis. We can assume that for the youngest, living in a large household can represent a model to replicate once they have their own family.

As expected, a strong association emerged between the desired number of children and the actual number of children (Günther and Harttgen 2016).

As for gender-equitable attitudes (Q1), consistent with previous studies (e.g., Snow, Winter and Harlow (2013) for young men residing in five East African countries; Isiugo-Abanihe (1994) for men living in five Nigerian cities), tolerance for wife beating is positively associated with the ideal number of children for both men and women. Our findings confirm that women expressing greater tolerance for wife beating have higher fertility ideals. We cannot interpret the association between tolerance for wife beating and higher fertility ideals in a similar way for men and women. Tolerance for wife beating for women is associated with its practice. Women living in violent households are not free to express their will, to discuss family planning with their husband, or to use contraception. Their fertility decisions are very limited.

Additionally, as a proxy for gender-equitable attitudes we used exposure to mass media, because it may be seen as an indicator of openness to the world and also as a vector of information related to family planning. Several studies have shown a negative association between exposure to mass media, in particular television, and desired (and realised) fertility (Westoff and Bankole (1997) for Africa; Barber and Axinn (2004) for Nepal; Jin and Jeong (2010) for South Korea; Jensen and Oster (2009) for India; Westoff and Bankole (1999) for Pakistan, India, and Bangladesh; Westoff and Koffman (2011) for 48 developing countries). Exposure to mass media is particularly important in the Egyptian context, as Egyptians are regularly exposed to mass media that have been traditionally used to convey health messages to the population (Ministry of Health and Population, El-Zanaty and Associates and ICF International 2015b; Amin 2014). Our results for women are consistent with previous studies showing that Egyptian women exposed to mass media desire fewer children than those who are not exposed, while no relationship emerged for men.

Women's empowerment, measured by a large set of indicators including their education, employment, attitudes toward decision-making in the household, and tolerance of wife beating, may play a fundamental role in changing ideal family size during fertility transition (Q2: Mason and Smith 2000; Cleland and Wilson 1987; Westoff 2010). In our analyses, the role of female and male education was particularly confirmed in relation to higher education, while paid work shows a positive relationship with the ideal number of children for both men and women.

As Olmsted (2003) underlines, the recent reduction in government spending has asymmetrically affected Egyptian women, who are more likely to work in the public sector, especially the (most highly) educated. Many researchers have argued that when employment opportunities become less available to women they are pushed back into the home and experience increased economic dependency on male household members, as well as a reduction in the opportunity costs of having children.

On the evidence of some (but not all) results, we can point to some important relationships between explanatory variables indicating women's empowerment and women's ideal number of children (Q2). Significantly, our findings corroborate the importance of married Egyptian women's participation in family decisions as a salient aspect of their agency. Egyptian married women having some say about visiting families or friends demonstrated a strong and negative association with ideal fertility, highlighting the importance of interpersonal and social relationships, as already pointed out by Samari (2019), Yount et al. (2016), and Assaad, Nazier, and Ramadan (2015). These findings seem to indirectly confirm that decision-making is an interaction in the household that provides an understanding of relationship dynamics. Several studies on developing countries have found that households where decisions are made jointly have a lower probability of intimate partner violence than households where either the husband or wife dominates decision-making (Ambrosetti, Abu Amara, and Condon 2013; Zegenhagen, Ranganathan, and Buller 2019).

The effect of such variables of women's autonomy becomes weaker when controlling for the individual socioeconomic variables. Similar results are shown by Abbasi-Shavazi, McDonald, and Hosseini-Chavoshi (2009) on Iran, where women's autonomy, especially their ability to move freely, has a clear impact on fertility behaviour. However, the effects of the province (labelled by the authors "unmeasured cultural variables") on fertility behaviour are much stronger than those of the other individual variables. Cultural context can define not only gender roles but also the norms of acceptable behaviour, rights, and duties linked to these roles. Our results show that region and type of residence are highly associated with desired fertility for both women and men. Living in the Urban Governorates or Lower Egypt is negatively associated with a strong attachment to the ideal of larger families, confirming that different levels of

modernisation may play an important role in accounting for the regional differences in demographic behaviour (Easterlin et al. 1988; Hallouda, Farid, and Cochrane 1988).

Our findings for men corroborate results already obtained on Egyptian women (Rashad and Zaky 2013; De Bel-Air 2017): desired fertility is highest among the poorest, those living in rural areas, and those with limited education. Therefore, the attention that the new population policy dedicates to the rural areas where the fertility rate is particularly high is important. Socioeconomic indicators vary greatly across the different areas of the country: it is worth stressing the importance of place and type of residence in determining male and female desired family size. Far from being a simple result of individuals' or even couples' decisions, fertility-related behaviours must be understood in the broader context of a social world of women and men (Madhavan, Adams, and Simon 2003).

Our findings confirm that women living in Upper Egypt and the Frontier Governorate continue to have higher fertility ideals than women in urban communities, even when accounting for women's agency and other individual characteristics. For Egyptian women, particular attention must be devoted to the context they belong to as a major factor affecting their empowerment: education and/or employment do not necessarily enhance autonomy if traditional factors remain strong.

Our conclusions are not only consistent with the actual population policy implemented in Egypt, which addresses women from regions where fertility is particularly high: they also corroborate the explanations of the rising fertility trends in Egypt emerging from recent research. In a context of incomplete women's emancipation, having three children remains socially desirable for Egyptian women because childbearing is a fundamental step to affirm their status. In particular, when opportunities outside the household decrease, maternity has a great value for all women, as having children endows them with power in the household and acceptance at the societal level, while childless women experience social isolation.

Our findings show that traditional masculine values are associated with higher ideal family size, while more equitable gender attitudes are associated with lower ideal family size for both men and women. Thus, gender equality and women's empowerment deserve further attention from policymakers. Promoting gender equality may be a policy instrument to lower actual and ideal fertility. Two different dimensions of agency, education and mass-media messages, may play an important role in promoting smaller families. As highlighted by our results, men also need to be taken into account when implementing population policies, given the critical role they play in fertility decisions.

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