Women's agency and fertility in the Middle East and North Africa

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Introduction

The Middle East and North African (MENA) region has experienced a sharp decline in fertility in recent decades: From 1980 to 1984, the total fertility rate in the region was 5.7 but dropped to 3.1 by 2002 (Tabutin et al. 2005). The demographic transition "is in full swing" (Puschmann and Matthijs 2015: 123), but in some countries, standstills or even increases in fertility, known as fertility stalls, have been observed (Engelhardt et al. 2018; Krafft et al. 2021). Interestingly, such stalls occur toward the end of the fertility transition (Krafft et al. 2021) and not in the early phases of the transition, as has been seen in many sub-Saharan African countries (Bongaarts 2006; Schoumaker 2019). This unusual development in some MENA countries draws the attention of scholars because it is a deviation from the general theory of the demographic transition (Al Zalak and Goujon 2017). In most MENA countries, both actual and ideal fertility are still above the replacement level and the rate of natural increase is still high (Haghighat 2018). For example, in Egypt, the most populous country in this region, the mean personal ideal number of children was stable at around three during the period 1988–2014 (Ambrosetti et al. 2019), close to the total fertility rate of 3.1 children per woman in 2018 (Krafft et al. 2022). The Egyptian and Jordanian governments have identified population growth as one of their greatest challenges. Accordingly, they have both set a goal to reach replacement fertility (El-Saharty et al. 2022; Higher Population Council [Jordan] 2013). Egypt and Jordan are among the countries studied in this dissertation and fertility stalls have been observed in both countries.

The MENA region is characterized by a strong patriarchal context, with the gender regimes of many countries classified as "neopatriarchal" (e.g., Gulf monarchies, Egypt, Jordan, Iran; Moghadam 2020: 473). Patriarchal family laws are in place in this frame, as the husband is traditionally expected to protect his wife and children and financially provide for them, while the wife is responsible for household and childrearing tasks and is expected to obey her husband (Hoodfar 1997; Moghadam 2004, 2020). Based on this "patriarchal contract" (Moghadam 2004: 145), childbearing represents a social norm for women. The traditional gender division of labor is reflected in the low female labor market participation, which is, however, not consistent with women's increased educational attainment. This labor participation mismatch is known as the MENA paradox (Assaad et al. 2020). Although the MENA region is close to gender parity in education, it ranks last on gender equality indicators in a worldwide

comparison, including in economic and political empowerment (World Economic Forum 2022).

To reach the goal of lower fertility, women's empowerment is considered key to the success of population strategies, e.g., the ones in Jordan and Egypt (El-Saharty et al. 2022; Higher Population Council [Jordan] 2013). A direct indicator of women's empowerment is women's agency (Richardson 2018), which refers to their ability to "define their own life choices and to pursue their own goals, even in the face of opposition from others" (Kabeer 1999: 438). Women's agency is most commonly measured by women's decision-making power (Donald et al. 2017; Kabeer 1999; Richardson 2018); other measures often used are freedom of movement and access to and control over financial resources (Carlson et al. 2015; James-Hawkins et al. 2016; Prata et al. 2017; Pratley 2016; Thorpe et al. 2016; Upadhyay et al. 2014). A large body of research shows that women with more agency have or prefer to have fewer children compared to women with less agency (reviewed in Upadhyay et al. 2014; more recent studies, e.g., Ambrosetti et al. 2021; Haque et al. 2021). However, with a few exceptions that focus on Egypt (Ambrosetti et al. 2021; Samari 2017b), this research is limited to sub-Saharan Africa and South Asia. Moreover, studies on the relationship between women's agency and unwanted fertility in the MENA region are completely lacking. Contrary to findings in other regions, Samari (2017b) surprisingly found a positive association between higher agency and Egyptian women's number of children. A partial explanation for such a positive association could be reverse causality: Motherhood or a higher number of children might positively affect women's agency because childbearing is an integral part of a woman's life course in the MENA region and is important for women's social position (Hoodfar 1997; Kabeer 1999; Yount et al. 2016). However, there is only one study on the effect of childbirth on women's agency in the MENA region (Samari 2017a). This study showed positive associations between births and agency in Egypt and provides valuable first insights. Samari (2017a) used longitudinal data from the Egypt Labor Market Panel Survey and the analysis accounts for causal ordering by regressing the number of births in wave 2006 on agency in wave 2012. The method, however, does not allow for the identification of causal effects as it cannot protect against bias arising from unobserved time-invariant heterogeneity.

The dissertation contributes to filling some of the aforementioned research gaps. It provides empirical evidence on the relationship between women's agency and fertility in the MENA region, where there is little research on this topic and the few existing studies are limited to Egypt. Specifically, Studies 1 and 2 aim to answer the research question of whether childbirth

positively affects women's agency; Study 3 addresses the relationship between agency and desired fertility as well as between agency and unwanted births. Using cross-sectional data from the Integrated Labor Market Panel Survey (OAMDI 2018), Study 1 compares the association between motherhood and agency in three MENA countries, namely Egypt, Jordan, and Tunisia. It also explores how the relationship varies by women's educational attainment and provides a comparative overview of women's agency in the three countries. Study 2 uses longitudinal data from the Egypt Labor Market Panel Survey (2006, 2012, 2018; Economic Research Forum and Central Agency for Public Mobilization and Statistics 2019) to investigate whether women's agency changes with birth transitions and if this change differs by education or rural versus urban residence. It estimates fixed effects regression models, which rest on weaker assumptions for the identification of causal effects than the assumptions of the methods used in the former studies. Study 3 examines whether Egyptian and Jordanian women's agency is associated with their personal ideal number of children and their ability to have no more children than desired. Moreover, it adopts a "couple's perspective" by examining whether the positive effect of agency on preventing unwanted births is also evident in case of disagreement between spouses about the ideal number of children, which has not been considered in previous research. The study uses cross-sectional data from the 2015 Egypt Health Issues Survey (EHIS; Ministry of Health and Population [Egypt] et al. 2015) and the 2017–2018 Jordan Population and Family Health Survey (JPFHS; Department of Statistics [DOS] and ICF 2019), which were the first Demographic and Health Surveys in Egypt and Jordan to ask both male and female participants about fertility and fertility desires.

The selection of the three MENA countries, Egypt, Jordan, and Tunisia, explored in this dissertation is primarily due to data availability. However, the three countries differ in terms of patriarchal context and fertility and thus partly represent the heterogeneity in this regard within the MENA region. They are also very different in terms of population size and the share of the rural population. While Egypt is the most populous country in the MENA region with about 103 million people, of whom 57% lived in a rural setting in 2018, the populations of Jordan (about 10 million) and Tunisia (about 12 million) and their shares of populations living in rural areas (9% and 31%, respectively) are much smaller (United Nations et al. 2018). Unlike Egypt and Jordan, Tunisia has reached replacement fertility (Engelhardt et al. 2018), and its gender regime is classified as "conservative-corporatist […], characterized by strong feminist movements, the visibility of women in the professions (especially the judiciary), and reformed family law" (Moghadam 2020: 469). The cross-country analyses of the relationship between

fertility and agency make it possible to detect similarities and differences across the three MENA countries.

Studying women's agency and its relation to fertility is crucial in itself: Agency is important for women's and their children's health and well-being (Doan and Bisharat 1990; Kishor 2000; Shroff et al. 2009, 2011; Yount et al. 2014). As nearly every woman in the MENA region experiences a transition to motherhood, it is important to know how their fertility influences their agency. In Egypt and Jordan, where fertility is still high, a better understanding of the role of women's agency in fertility desires and the realization of their ideal number of children may be relevant to the development of effective family planning programs. Moreover, unintended pregnancies can have negative health and economic impacts on women and their families (Gipson et al. 2008). The 1994 International Conference on Population and Development in Cairo (United Nations Population Fund 2014) has determined that it is a basic human right to make decisions freely about the number of children, and agency likely enables women to practice this right.

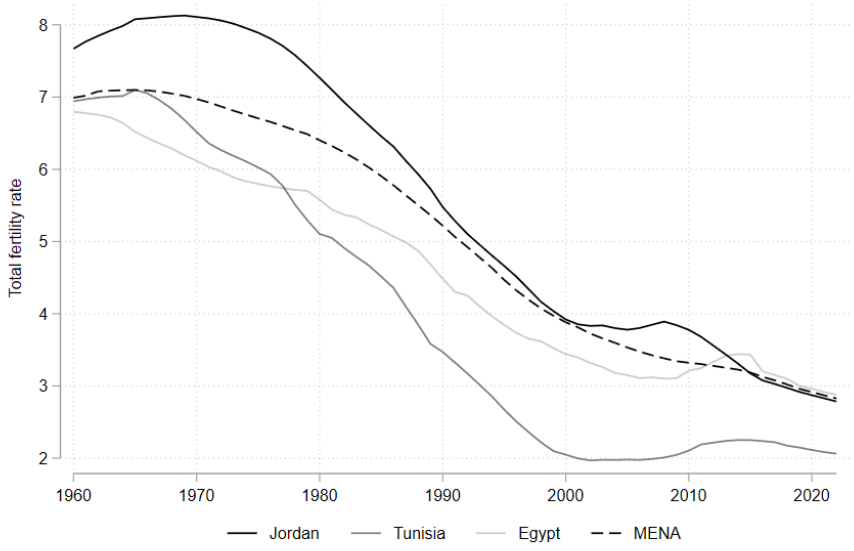
This introduction chapter has several sections. Section 1 provides an overview of fertility trends in the MENA region, with a special focus on the three countries studied in this dissertation, namely Egypt, Jordan, and Tunisia. Section 2 describes the conceptualization and measurement of women's agency. Section 3 presents the theoretical framework, and Section 4 provides an overview of the three studies of this cumulative dissertation, which summarizes the approaches and key findings. Finally, Section 5 comprises general conclusions.

Fertility developments and motherhood in the Middle East and North Africa

Fertility decline in the MENA region started later than in the Western world, but the pace of the demographic transition is much faster (Puschmann and Matthijs 2015). Over the last decades of the 20th century, fertility has considerably declined in all countries of the Middle East and North Africa (Casterline 2011; Engelhardt et al. 2018; Tabutin et al. 2005). Nevertheless, fertility trends and levels are heterogeneous across MENA countries (United Nations et al. 2022). In this section, I use a broad definition of the MENA region, including the 22 member states of the Arab League (Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen) and their two neighboring countries (Turkey and Iran).

In 2022, the total fertility rate (TFR) ranged from 1.4 children per woman in the United Arab Emirates to 6.2 children per woman in Somalia (United Nations et al. 2022). Figure 1 shows the development of the TFR in Egypt, Jordan, Tunisia, and the entire MENA region since 1960. While fertility in Tunisia is already at replacement level with a TFR of 2.1 in 2022, the TFR in Egypt (2.9) and Jordan (2.8) is equal to the MENA average of 2.8 children per woman (United Nations et al. 2022). Several MENA countries experienced unexpected fertility stalls between 2000 and 2015. Egypt experienced a fertility stall starting in 2006, with a TFR that increased from 3.0 in 2008 to 3.5 in 2014 (Al Zalak and Goujon 2017; Ambrosetti et al. 2021), but by 2018, it had declined again to 3.1 (Krafft et al. 2022). Moreover, in Tunisia, a slight increase in fertility was observed between 2005 and 2015 (United Nations et al. 2022). Jordan is the first MENA country where a long fertility stall (from the late 1990s to 2011 of around 3.8 children per woman) ended, and since 2012, fertility decline has resumed (Cetorelli and Leone 2012; Krafft et al. 2021). Other countries that have experienced a fertility stall are Algeria, Iraq, Morocco, and Oman (Krafft et al. 2021). Similar to Egypt, Algeria also experienced a significant increase in its TFR between 2005 and 2015 (Al Zalak and Goujon 2017; Krafft et al. 2021).

Figure 1: Total fertility rate 1960–2022 in Egypt, Jordan, Tunisia, and the MENA region.



Notes: The MENA region is defined by the 22 member states of the Arab League (Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, the United Arab Emirates, and Yemen) and their two neighboring countries (Turkey and Iran). *Source:* United Nations et al. 2022.

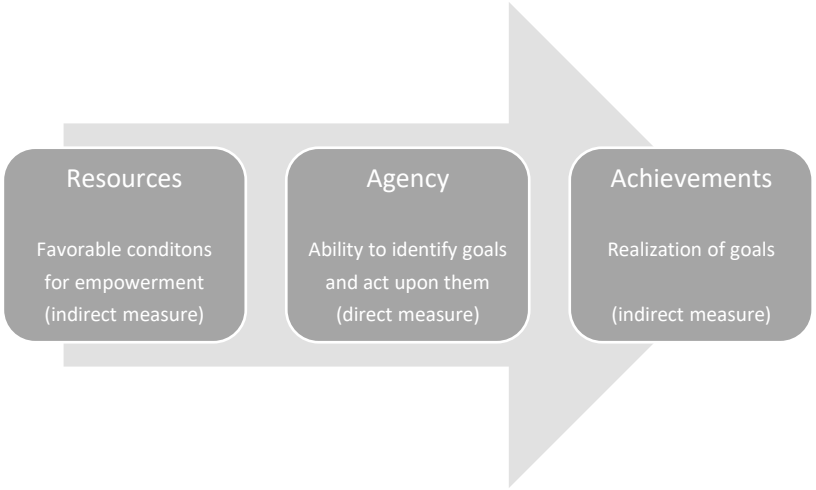
While TFRs in the MENA region have declined sharply since the 1980s, parenthood and marriage remain almost universal and are integral parts of a woman's life course. Interestingly, although the age at first marriage has risen considerably for both men and women, the institution of marriage has not weakened (Puschmann and Matthijs 2015; Rashad and Osman 2003). Moreover, marriage is still an important cultural and legal precondition for sexual relationships (Rashad et al. 2005; Singerman 2013), and based on the "patriarchal contract" (Moghadam 2004: 145), childbearing represents a social norm for women. The existing literatures argues that motherhood is important for a woman's social position (Hoodfar 1997; Kabeer 1999; Yount et al. 2016). Consequently, childlessness is rare in the MENA region (Rutstein and Shah 2004), and women typically have their first childbirth soon after marriage (Eltigani 2000; Gebel and Heyne 2014). For example, between 1994 and 2000, childlessness among currently married women aged 40–44 years was 2.4% in Jordan and 2.8% in Egypt (Rutstein and Shah 2004). Moreover, the two-child norm is not widespread in the MENA region; instead, the family model of three children is common (Casterline 2011; El-Zeini 2008). Women's mean personal ideal number of children varies across MENA countries and in Egypt, Jordan, and Tunisia. In Jordan, it was 3.8 in 2017, which is considerably higher than the TFR (Krafft et al. 2021). The mean personal ideal number of children in Tunisia was 2.8 in 2001, which is also much higher than the TFR of two children per woman in the same year (Casterline 2011; United Nations et al. 2022). In Egypt, on the other hand, the TFR was close to the mean personal ideal number of children, with the latter remaining stable at around three children per woman between 1988 and 2014 (Al Zalak and Goujon 2017; Ambrosetti et al. 2019).

Women's agency: Conceptualization and measurement

This dissertation follows Kabeer's (1999) definition of agency, namely "people's capacity to define their own life choices and to pursue their own goals, even in the face of opposition from others" (p. 438). Kabeer's conceptual model of the empowerment process is probably the most influential in the literature (Richardson 2018). The terms "women's empowerment" and "women's agency" are often used as synonyms (James-Hawkins et al. 2016; Thorpe et al. 2016). In Kabeer's (1999) seminal work, however, agency is introduced as a component of empowerment that "refers to the expansion in people's ability to make strategic life choices in a context where this ability was previously denied to them" (p. 437). Figure 2 shows this conceptual model: In the empowerment process over time, women acquire resources (pre-conditions), which serve to enhance their agency (acting on self-defined goals), and, in turn,

their achievements (outcomes). Thus, agency is the component that links resources to achievements. Resources create conditions that can lead to greater agency, and they are not only material but also social resources (Kabeer 1999). Achievements are the realization of self-defined goals, e.g., labor market participation (Richardson 2018). While agency is a direct measure of empowerment, resources and achievements are only proxy measures of empowerment (Kishor 2000; Malhotra and Schuler 2005; Samman and Santos 2009, as cited in Richardson 2018). Richardson (2018) recommends that researchers use direct indicators of empowerment (i.e., agency) since the causal direction of many indirect measures (e.g., education or employment) is unclear; indirect measures can be resources for agency, achievements of the empowerment process, or even both. Moreover, resources do not necessarily translate into agency (Kabeer 1999; Malhotra and Schuler 2005).

Figure 2: Conceptual model of empowerment process.



Source: Richardson (2018), adopted partially from Kabeer (1999).

Aside from the terms "women's agency" and "women's empowerment," other related terms such as "women's autonomy" or "women's status" can be found in the empowerment literature. Several scholars have criticized this variation in terminology as well as a lack of theory in many empirical studies (James-Hawkins et al. 2016; Malhotra and Schuler 2005; Richardson 2018; Yount et al. 2016). Malhotra and Schuler (2005) reviewed terms used in the empowerment literature and concluded that the concept of "'agency' probably comes closest to capturing what the majority of writers see as the essence of empowerment" (p. 72).

Agency can take the form of bargaining (Kabeer 1999) and overlaps with bargaining power, "although a key difference between the two is that bargaining power is relational by

definition (as it orders the relative power between two or more individuals)" (Donald et al. 2017: 5). All three studies in this dissertation focus on the agency of married women, and in the patriarchal context of the MENA region, a wife's agency likely depends strongly on and overlaps with the relative bargaining power between her and her husband. Literature on women's agency in the Western context evolved in the 1960s (e.g., Blood and Wolfe 1960; Safilios-Rothschild 1970). This literature focused on the distribution of power between husband and wife or between family members in general, with "power" measured by participation in decision-making. Participation in decision-making is also the most commonly used measure for agency in quantitative studies on empowerment in low- and middle-income countries (Donald et al. 2017; Kabeer 1999; Richardson 2018). For example, in the nationally representative Demographic and Health Surveys in more than 90 developing countries, women are asked about the main decision-maker in their family ("who usually makes decisions…") concerning the respondent's own health care, major household purchases, and visits to family or relatives (The DHS Program 2020). Response options for married women are respondent, husband, respondent and husband jointly, or someone else (ibid.). The use of this measurement of agency is based on the idea that the more decisions a woman is involved in, the more control she has over her own life (Kishor 2000). Further dimensions of agency have been identified in addition to decision-making, and most authors agree that it is a multidimensional construct (Agarwala and Lynch 2006; Mason 1986; Richardson 2018; Yount et al. 2016). Other dimensions that are often used to capture women's agency are freedom of movement and access to or control over financial resources (Carlson et al. 2015; James-Hawkins et al. 2016; Prata et al. 2017; Pratley 2016; Thorpe et al. 2016; Upadhyay et al. 2014). Empirical evidence supports the idea that women can have agency in one dimension while not having agency in other dimensions (Samman and Santos 2009). It is, therefore, important to measure different dimensions of agency separately (Richardson 2018). Furthermore, researchers should be careful when using summary scores and should distinguish between indicators within the same dimension in their analysis if there are theoretical reasons for doing so, such as by estimating indicators separately (Malhotra and Schuler 2005; Richardson 2018). For instance, it might be reasonable to differentiate between participation in decisions that affect the entire household (e.g., purchases) and decisions that concern only the woman herself (e.g., health care).

The measures "decision-making" and "freedom of movement" were empirically validated in the Egyptian context (Cheong et al. 2017; Salem et al. 2020; Yount et al. 2016), and ethnographic research confirmed that these two dimensions of agency matter to women (Drolet 2010; Henry 2011). With some exceptions (e.g., Kishor 2000; Yount 2005), very little

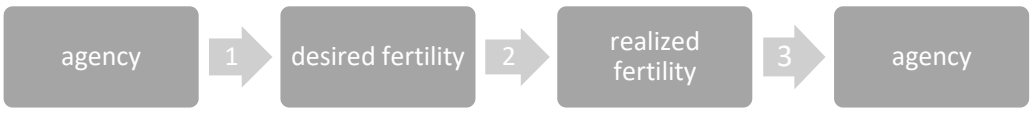
attention had been paid to measuring agency in the MENA region prior to these validation studies. Some scholars distinguish between instrumental agency (the ability to act) and intrinsic qualities of agency, such as gender role attitudes (e.g., Samari 2019). This dissertation focuses only on instrumental agency, measured by decision-making, freedom of movement, and access to household money.

Theoretical framework

In this dissertation, the relationship between women's agency and fertility is considered in both causal directions. Agency is not stable but is likely to change over the life course and in this dissertation it is treated as a predictor variable as well as an outcome variable (see Figure 3). Based on the theoretical arguments presented in the following paragraphs, it is expected that women's agency decreases the realized number of children due to lower fertility desires and having control over fertility decisions (pathways 1 and 2). After the birth of the first child, the mother role and the number of children are expected to positively influence women's agency (pathway 3). Studies 1 and 2 in this cumulative dissertation examine the third pathway that is shown in Figure 3. Furthermore, Study 3 analyzes the first and second pathways, with a focus on preventing unwanted births.

In this dissertation, the focus is on women's agency and fertility within marriage only, because childbirth very rarely occurs outside marriage in the MENA region. Similar to having children, marriage is a central part of the transition to adulthood because it legitimizes sexual relationships (Rashad et al. 2005; Singerman 2013), and young women generally leave their parents' homes after marriage (Gebel and Heyne 2014). While a woman's agency can be restricted by her parents before marriage, it can be restricted by her husband and, possibly, her in-laws after marriage.

Figure 3: Relationship between women's agency and fertility.

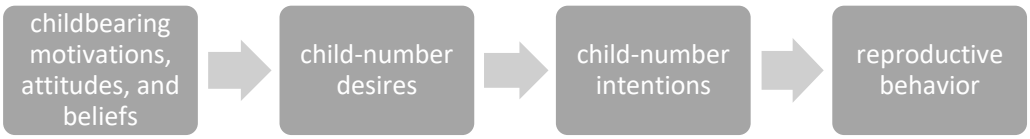


Source: Own illustration.

The next paragraphs present theoretical considerations for each pathway shown in Figure 3. The influence of agency on desired fertility (1) and the influence of desired fertility on realized fertility (2) are closely linked. However, since childbearing behavior is the outcome of a decision-making process, it is important to focus first on the formation of desires regarding fertility and then on the actual fertility outcomes.

(1) The traits–desires–intentions–behavior (TDIB) theoretical framework distinguishes between child-number intentions and child-number desires (Miller 2011; Miller and Pasta 1995). Although the demographic literature often uses these two terms synonymously, they are two theoretically distinct concepts. While fertility intentions consider potential obstacles to childbearing, such as housing or financial shortages, fertility desires do not (Philipov and Bernardi 2011). Desires are "what one would like to do given no situational constraints" (Miller et al. 2004: 194), whereas intentions are formulated by individuals, considering the specific situation, constraints, and contextual factors in which they find themselves (Miller et al. 2004). According to the TDIB sequence, desires "are psychologically intermediate between motivations, attitudes, and beliefs on the one hand and intentions on the other" (Miller and Pasta 1995: 531). They do not directly lead to action but are first translated into fertility intentions, which comprise the final pathway through which they affect reproductive behavior (see Figure 4). In this dissertation, fertility desires or child-number desires are used as synonyms for the term "personal ideal number of children" since they refer to the same concept. Philipov and Bernardi (2011) state that "[t]he personal ideal, when operationalised to refer to best conditions of life, measures fertility desires as defined in socio-psychological theories" (p. 496). Testa (2012) distinguishes the personal ideal number of children from a societal ideal, which refers to fertility preferences at the normative level, i.e., the ideal number of children for a family in general.

Figure 4: Simplified version of the traits–desires–intentions–behavior sequence adapted from Miller and Pasta (1995)



According to the TDIB framework, beliefs and attitudes toward childbearing influence the formation of child-number desires. The level of agency is likely to shape these beliefs and attitudes because the meaning of agency—to have choices and be able to pursue them (Kabeer 1999)—contrasts with the idea of predetermined roles for women, namely mother and wife. Agency empowers women to overcome patriarchal gender role expectations and set life goals that go beyond the traditional roles of mother and wife without feeling compelled to bear a large number of children at the expense of their health and well-being. Based on these beliefs and attitudes, women with high agency are likely to desire a lower number of children than women with low agency, and they should be able to express their desire to have a specific number of children, even if their preferences diverge from societal expectations.

(2) Furthermore, I expect that women in the MENA region who have higher agency can better translate their fertility desires into fertility outcomes, which should also lead to a lower likelihood of unwanted births. As explained above, child-number desires are the number of children an individual wishes to have (Miller and Pasta 1995). Desired fertility is a better indicator than the intended number of children for determining whether a woman's realized number of children is the same as the number of children she wanted (Miller 2011; Philipov and Bernardi 2011) because fertility intentions reflect the total number of wanted children due to specific circumstances and are, thus, (downward) adjustments of the true reproductive goal. Still, it is important to take a closer look at the translation of fertility desires into intentions since the latter are the proximate determinants of fertility outcomes. One essential criterion that can lead to a lower intended number of children than the desired number of children is the opportunity cost of childbearing.

The opportunity costs of having children are higher for women with high agency than for women with low agency. The more a woman depends on and is restricted to the private sphere, the fewer her alternative roles and activities that compete with childbearing and, hence, the lower her opportunity costs of having additional children, or as Mason (1987) puts it: "[W]hen women are secluded in the household, they lose little by bearing numerous children. When their autonomy permits them to engage in alternative activities, including remunerative employment, however, the opportunity costs of children are potentially greater" (p. 733). Assuming that fertility decisions are rational and the result of a cost–benefit analysis (Becker 1960), women with high agency should, thus, intend to have fewer children than women with low agency. Paid labor is not the only activity that competes with household and family roles. Although women with higher agency are more likely to be employed than women with lower

agency (Gebel and Heyne 2014; Selwaness and Krafft 2021), labor market participation among women in the MENA region is low (Assaad et al. 2020). It is, therefore, necessary to consider other alternative activities aside from employment that compete with the role of a mother, e.g., leisure and social life. Prerequisites for participation in any activities outside the home are, for example, freedom of movement and the ability to freely decide about visits to friends.

Women with higher instrumental agency are expected to be more likely to achieve their intended number of children than women with lower instrumental agency since they should have more control over having children by being able to pursue their self-defined goals (Kabeer 1999). Limiting the actual number of children to the intended number of children would also result in a lower likelihood of having more children than the desired number of children because women's fertility intentions are normally lower than women's fertility desires due to the opportunity costs of having children and other personal circumstances.

To understand the influence of married women's fertility desires on reproductive outcomes, one must consider the husband's fertility desires as well. Fertility intentions are predicted not only by an individual's fertility desires but also by the perceived fertility desires of their partner (Miller et al. 2004). This fact implies that a woman's child-number intentions can be higher than her child-number desires if her husband has a higher desired number of children than she does. Women with high instrumental agency should be less likely to adapt their intentions to the desires of their husbands than women with low agency because having agency means that someone can pursue their goals "even in the face of opposition from others" (Kabeer 1999: 438). Moreover, it is important to consider potential disagreements in fertility desires between husbands and wives. Regarding unwanted births, the question arises whether a woman with high agency in a strong patriarchal context can still limit her realized number of children when her husband wishes to have more children. Following the concept of agency that women with high agency can make decisions even in the face of others' reluctance (ibid.), whether the husband has a larger ideal family size than his wife should make no difference for women with agency in preventing unwanted births.

(3) Previous family research has widely used bargaining models to examine the distribution of resources and power in couples (Abraham et al. 2010; Bittman et al. 2003; Bünning 2020; Cooke 2006; Lundberg and Pollak 1996). According to classical resource theory, the spouse with the most valued resources has more power over the other in their marriage (Blood and Wolfe 1960). Likely, women's agency is directly related to the relative bargaining power of spouses; if a woman's bargaining power within the marriage increases, she

can likely negotiate and increase her involvement in decision-making, access to household money, and freedom of movement. This dissertation argues that having children can be considered a gendered resource that can increase married women's bargaining power and, in turn, their agency. Within the highly patriarchal context of the MENA region, motherhood and having additional children provides two resources or opportunities that women can use in negotiation processes to enhance their agency. First, childbirth is assumed to increase women's social position (Kandiyoti 1988; Yount et al. 2016). Second, the increased number of household and childbearing tasks after childbirth allows women to argue that they require more freedom to adequately perform these tasks. For example, a woman could say that she needs access to household money, freedom of movement to go to the market, and decision-making power regarding household purchases and meals to adequately take care of daily household needs and cooking. Moreover, a husband may allow his wife more freedom after childbirth to ensure a well-functioning everyday family life and to disburden himself from household responsibilities. Subsequently, the transition to motherhood and further births is expected to positively impact a woman's agency.

It may initially seem paradoxical that women with agency are expected to desire and intend a low number of children, as described in (1) and (2), but, at the same time, realized fertility could increase women's agency in the MENA context. One could argue that women with agency are aware of this possible extension of bargaining power due to children and, therefore, do not desire and intend a lower number of children. However, the expected background mechanisms can resolve the paradox. Motherhood is almost universal in the MENA region, and the social pressure to have children is high for all women. Because of this pressure, the opportunity costs of children are expected to meaningfully impact only preferring a lower number of children—i.e., one or two children—and have little influence on the decision to have children per se. Moreover, this work does not expect a linear association between the number of children and agency, but that there is an effect of the first, second, and maybe third birth transitions, as the family model of three children is common (Casterline 2011; El-Zeini 2008). An interesting question to explore is whether, in the high patriarchal context of the MENA region, motherhood or subsequent births could also positively affect agency, even though the loss of resources such as employment might concurrently lead to a decrease in agency. In this case, women with very low agency who likely have few resources to lose might gain from the mother role. However, this gain would only be a gain in contextual power and freedom limited to the role as a mother. As noted in the literature review, some evidence already indicates such a relationship in the Egyptian context (Samari 2017a). While women might be aware of

opportunity costs regarding employment or other activities, an increase in agency due to the mother role or subsequent births might be less expected, especially for women who already have high agency. The idea that opportunity costs are lower for women with low agency than for women with high agency will find further support if women with low agency judge that having children could increase their agency.

Overview of the three studies

Study 1: Women's agency in Egypt, Jordan, and Tunisia: The role of parenthood and education

The first study examines the effect of motherhood on women's agency in three MENA countries, namely Egypt, Jordan, and Tunisia, and how the effect of motherhood is moderated by women's education. This study also provides an initial comparative overview of women's social position and level of agency in three MENA countries that vary across several socioeconomic and demographic indicators, e.g., educational attainment, fertility levels, population size, proportion of urban population (Haghighat 2018), and patriarchal context (Moghadam 2020). The study uses data from the Integrated Labor Market Panel Surveys (OAMDI 2018) Egypt 2012, Jordan 2016, and Tunisia 2014. This data allows the consideration of three dimensions of women's agency, namely involvement in decision-making, access to household money, and freedom of movement. The study estimates multivariate regression models.

Based on the analytic samples, which include married women aged 18–49 years, the descriptive results show that in all three countries, the vast majority of women, about 90%, have at least one child. Regional heterogeneity is visible regarding women's agency. For example, access to household money and freedom of movement are much lower in Jordan than in Egypt and Tunisia. The results from multivariate regression models demonstrate that mothers generally exhibit higher levels of agency than their counterparts who are childless, although this does not hold for every dimension, and the strength of the association between motherhood and agency differs by dimension and country. In all three countries, mothers are more likely to have access to household money than childless women; this association is the strongest in Tunisia. In Egypt, motherhood is also positively associated with freedom of movement. However, heterogeneity analyses by education show that the positive associations between motherhood and agency in Egypt are not visible among highly educated women with post-secondary education. Among those women, motherhood seems to decrease agency, which

suggests that they may not gain bargaining power by having children, as childbirth may weaken their other resources connected to earnings and employment. Motherhood may only increase a woman's agency in a very patriarchal and gender-traditional setting, where the wife has low or no education, is not employed, and does not seek a professional career.

Samari (2017a) found a positive relationship between births and agency in Egypt as well. Study 1 in this dissertation extends the study of Samari's (2017a) research by providing evidence in two additional MENA countries and showing that the relationship between agency and motherhood in Egypt depends on women's education. However, both studies have one main limitation: Their methods rest on the strong assumption of exogeneity of the time-constant unobserved heterogeneity, which is likely to be violated. Thus, both studies, are unable to determine a causal effect. For example, confounders such as social background, cohort, or personality traits could bias the results. Moreover, it is not possible to account for infertility in the analyses. Infertility could also act as a confounder of the relationship between motherhood and agency, as it likely affects both motherhood and agency negatively. Study 2 addresses this limitation by using longitudinal data from the Egypt Labor Market Panel Survey (Economic Research Forum and Central Agency for Public Mobilization and Statistics 2019) and estimating fixed effects regression models.

Study 2: Women's agency and childbirth: The effect of transition to motherhood and subsequent births on women's agency in Egypt

The second study investigates whether women's agency changes with birth transitions in Egypt and whether this change differs by education or rural versus urban residence. This study draws on panel data from the Egypt Labor Market Panel Survey (2006, 2012, 2018; Economic Research Forum and Central Agency for Public Mobilization and Statistics 2019) and estimates fixed effects regression models. Study 2, therefore, rests on weaker assumptions for identifying causal effects than the methods used by Samari (2017a) and in Study 1. The analysis compares women's agency before and after the birth of their first child and before and after the birth of their second child.

The results show that the transition from having one child to having at least two children increases women's decision-making power but not financial autonomy or freedom of movement. This effect is stronger for less-educated women and women living in rural areas than for higher-educated women and women living in urban areas. Women living in urban areas

even experience a decrease in agency after childbirth. Further analysis indicates that the positive effect of having at least two children on the decision-making power of low-educated women and women living in rural areas is driven not only by greater participation in decisions related to household responsibilities but also by greater involvement in decisions about their own health care or buying clothes. This finding suggests that women's increased agency might result not only from an increase in household tasks but also from an increase in women's value and position after childbirth transitions.

Crucially, the results did not confirm a positive association between motherhood and agency in Egypt, as found in Study 1 and Samari's (2017a) work. Neither of these two studies could account for time-constant individual-specific heterogeneity, unlike the fixed-effects regression models in Study 2. The finding of Study 2 thus suggests that women in Egypt may select themselves into birth transitions based on unobserved factors that also affect their agency. For example, infertility may negatively affect both motherhood and agency (due to its associated stigma). Moreover, childless women could be an extremely special group since motherhood is almost universal in the MENA region. The results regarding the transition to motherhood also do not align with a previous study in a different context, India (Reed 2021), suggesting regional differences in the relationship between births and agency. Reed (2021) also estimated fixed effects regression models and found that the transition to motherhood has positive effects on freedom of movement and access to enabling resources. Reed's (2021) work focused only on the transition to motherhood and not on subsequent births transitions.

In sum, the results of Study 2 indicate that subsequent birth transitions affect agency in Egypt, although not across all agency dimensions, highlighting the importance of considering the multidimensionality of agency. The results also corroborate the assumption that the positive impact of births on agency is stronger for women who are more restricted to the mother role and live in more patriarchal contexts.

Study 3: Does women's agency matter in the formation and realization of fertility desires? An empirical investigation in Egypt and Jordan

While the first two studies focused on the impact of realized fertility on women's agency, Study 3 examines the role of women's agency in their fertility desires and the actual number of children. Specifically, it investigates whether the agency of women in Egypt and Jordan influences their personal ideal number of children and ability to have no more children than

they desire. Moreover, it adopts a "couple's perspective" by examining whether the relationship between women's agency and unwanted births persists even when spouses do not agree on the ideal number of children. Egypt and Jordan are interesting cases because there was a standstill in fertility decline in both countries; Egypt even noted an increase in fertility (Krafft et al. 2021).

The study uses data from the 2015 Egypt Health Issues Survey (EHIS; Ministry of Health and Population [Egypt] et al. 2015) and the 2017–2018 Jordan Population and Family Health Survey (JPFHS; Department of Statistics [DOS] and ICF 2019), which are both part of the Demographic and Health Surveys (DHS) program. Poisson regressions are used to estimate the association between agency and fertility desires, and linear probability models are used to estimate the association between agency and the ability to have no more children than desired. Women's agency is measured by women's decision-making power only, as questions about financial autonomy and freedom of movement are not part of the DHS questionnaires. The analyses are based on currently married women with children (aged 15–49 years for the analysis of fertility desires and 35–49 years for the analysis of unwanted births).

The descriptive results indicate that a non-negligible share of Egyptian and Jordanian women (around a third) are unable to limit their fertility to their desired number of children, i.e., they have at least one unwanted birth. In Egypt, the husbands' mean personal ideal number of children (3.97) is higher than the wives' personal ideal number of children (3.50). In Jordan, there is only a very slight difference between husbands' and wives' ideal number of children, 4.31 and 4.27, respectively. The results of multivariate regression models indicate that women's decision-making power decreases their ideal number of children in Egypt but surprisingly not in Jordan. In both countries, involvement in decisions about their own healthcare and, additionally, in Jordan, involvement in decisions about major household purchases are positively associated with women's ability to have no more children than desired. However, this positive association is not evident when the husband wants more children than his wife. In such couples, women's agency is negatively associated with avoiding unwanted births.

Ambrosetti et al. (2021) also found a negative association between Egyptian women's decision-making power and their personal ideal number of children. Study 3 extends Ambrosetti et al.'s (2021) findings from Egypt by providing evidence of the relationship between agency and fertility desires in an additional MENA country, Jordan, which is the first country in this region where a fertility stall has recently ended. Moreover, to the best of the author's knowledge, this is the first study on the relationship between agency and unwanted births in this region. Research on this relationship is relevant, as, at the aggregate level, both a

reduction in fertility desires and a reduction in unwanted fertility are important for fertility decline (Bongaarts and Casterline 2018). Finally, no previous study has investigated whether the relationship between women's agency and unwanted births persists even when spouses do not agree on the ideal number of children. Study 3, therefore, provides valuable insights into the role of agency in avoiding unwanted births in the event of a disagreement between wives and husbands regarding the ideal number of children. The results suggest that in the patriarchal context of the MENA region, the husband eventually decides on having additional children if he has a higher personal ideal number of children than his wife, and the wife's agency does not matter in this case.

Summary and conclusion

This dissertation aimed to provide evidence on the relationship between women's agency and fertility in the MENA region. Overall, the results of the three studies suggest not only an influence of agency on fertility outcomes but also a change of agency after birth transitions. The first two studies support the assumption that in the MENA region's patriarchal context, women's social status is linked to childbearing, which leads to an increase in agency. This effect is particularly evident in women who have few alternatives to the mother role due to low education and live in rural areas which are characterized by stricter patriarchal familial and societal structures. At the same time, the third study indicates that the agency of women is important for preventing unwanted births, and it yields two main conclusions that are also relevant for family planning programs in the region. First, the ability to decide freely regarding their health-care seems to be essential for women to avoid having more children than they want. Second, the results draw attention to the key role of men's fertility desires by showing that a woman's agency does not matter in preventing unwanted births if her husband wants more children than she does. Replacement fertility in the MENA region is only possible if both men's and women's fertility desires decline.

All studies point toward country-wise differences in the relationship between agency and fertility, suggesting that the particular country-context matters. Moreover, the relationship between motherhood and agency and the effects of birth transitions on agency differ depending on the agency dimension under study. These findings provide a valuable starting point for examining the specific background mechanisms for different agency dimensions and the contextual variations in greater detail. Such further investigations require a more

comprehensive understanding of women's decision-making power, freedom of movement, and financial autonomy in the patriarchal context of the MENA region. Questions that need to be answered include what value these have for the women themselves, what the constraints are on each agency dimension, and what strategies the women employ to expand their agency within marriage. Moreover, large-scale individual-level data from panel surveys at short time intervals in the MENA region would open up new possibilities to analyze the causal relationship between agency and fertility. Data that allows researchers to explore how agency helps women realize their concrete fertility intentions is required, and panel data would allow researchers to better address the problem of reverse causality between agency and fertility identified in this dissertation.

References

Abraham, M., Auspurg, K., and Hinz, T. (2010). Migration decisions within dual-earner partnerships: A test of bargaining theory. *Journal of Marriage and Family*, *72*(4), 876–892. https://doi.org/10.1111/j.1741-3737.2011.00868.x

Agarwala, R., and Lynch, S. M. (2006). Refining the measurement of women's autonomy: An international application of a multi- dimensional construct. *Social Forces*, *84*(4), 2077–2098. https://doi.org/10.1353/sof.2006.0079

Al Zalak, Z., and Goujon, A. (2017). Exploring the fertility trend in Egypt. *Demographic Research*, *37*(1), 995–1030. https://doi.org/10.4054/DemRes.2017.37.32

Ambrosetti, E., Angeli, A., and Novelli, M. (2019). Ideal family size and fertility in Egypt: An overview of recent trends. *Statistica*, *79*(2), 223–244. https://doi.org/10.6092/issn.1973-2201/8811

Ambrosetti, E., Angeli, A., and Novelli, M. (2021). Childbearing intentions among Egyptian men and women: The role of gender-equitable attitudes and women's empowerment. *Demographic Research*, *44*(51), 1229–1270. https://doi.org/10.4054/DemRes.2021.44.51

Assaad, R., Hendy, R., Lassassi, M., and Yassin, S. (2020). Explaining the MENA paradox: Rising educational attainment yet stagnant female labor force participation. *Demographic Research*, *43*(28), 817–850. https://doi.org/10.4054/DemRes.2020.43.28

Becker, G. S. (1960). An economic analysis of fertility. In National Bureau of Economic Research (Ed.), *Demographic and economic change in developed countries* (pp. 209–231). Princeton: Princeton University Press.

Bittman, M., England, P., Sayer, L., Folbre, N., and Matheson, G. (2003). When does gender

trump money? Bargaining and time in household work. *American Journal of Sociology*, *109*(1), 186–214. https://doi.org/10.1086/378341

Blood, R. O., and Wolfe, D. M. (1960). *Husbands and wives: The dynamics of married living*. Glencoe, IL: Free Press.

Bongaarts, J. (2006). The causes of stalling fertility transitions. *Studies in Family Planning*, *37*(1), 1–16. https://doi.org/10.1111/j.1728-4465.2006.00079.x

Bongaarts, J., and Casterline, J. B. (2018). From fertility preferences to reproductive outcomes in the developing world. *Population and Development Review, 44*(4), 793–809. https://doi.org/10.1111/padr.12197

Bünning, M. (2020). Paternal part-time employment and fathers' long-term involvement in child care and housework. *Journal of Marriage and Family*, *82*(2), 566–586. https://doi.org/10.1111/jomf.12608

Carlson, G. J., Kordas, K., and Murray-Kolb, L. E. (2015). Associations between women's autonomy and child nutritional status: A review of the literature. *Maternal and Child Nutrition*, *11*(4), 452–482. https://doi.org/10.1111/mcn.12113

Casterline, J. B. (2011). *Fertility prospects in the Arab region*. New York. https://www.un.org/en/development/desa/population/publications/pdf/expert/2011-6_Casterline_Expert-Paper_FINAL_ALL-Pages.pdf

Cetorelli, V., and Leone, T. (2012). Is fertility stalling in Jordan? *Demographic Research*, *26*(13), 293–318. https://doi.org/10.4054/DemRes.2012.26.13

Cheong, Y. F., Yount, K. M., and Crandall, A. A. (2017). Longitudinal measurement invariance of the women's agency scale. *Bulletin de Methodologie Sociologique*, *134*(1), 24–36. https://doi.org/10.1177%2F0759106317693787

Cooke, L. P. (2006). "Doing" gender in context: Household bargaining and risk of divorce in Germany and the United States. *American Journal of Sociology*, *112*(2), 442–472. https://doi.org/10.1086/506417

Department of Statistics (DOS) and ICF (2019). *Jordan Population and Family Health Survey 2017-18*. Amman, Jordan/ Rockville, Maryland, USA: DOS and ICF.

Doan, R. M., and Bisharat, L. (1990). Female autonomy and child nutritional status: The extended-family residential unit in Amman, Jordan. *Social Science and Medicine*, *31*(7), 783–789. https://doi.org/10.1016/0277-9536(90)90173-p

Donald, A., Koolwal, G., Annan, J., Falb, K., and Goldstein, M. (2017). *Measuring women's agency*. Policy Research Working Paper No. 8148. World Bank Group.

Drolet, J. (2010). Women, micro credit and empowerment in Cairo, Egypt. *International Social*

Work, *54*(5), 629–645.

Economic Research Forum, and Central Agency for Public Mobilization and Statistics (2019). *Egypt Labor Market Panel Survey, ELMPS (2018)*. Version 2.0 of the licensed data files (October, 2019), provided by the Economic Research Forum. http://www.erfdataportal.com/index.php/catalog.

El-Saharty, S., Elshalakani, A., Zeitoun, N., Crumpton, B., Kazem, A., Cornelia, J., and El-Assiouty, S. (2022). *Policy and strategic priorities for Egypt to reap its demographic dividend: Policy Brief*. Washington, DC: World Bank.

El-Zeini, L. O. (2008). The path to replacement fertility in Egypt: Acceptance, preference, and achievement. *Studies in Family Planning*, *39*(3), 161–176. https://doi.org/10.1111/j.1728-4465.2008.164.x

Eltigani, E. E. (2000). Changes in family-building patterns in Egypt and Morocco: A comparative analysis. *International Family Planning Perspectives*, *26*(2), 73–78. https://doi.org/10.2307/2648270

Engelhardt, H., Schulz, F., and Büyükkeçeci, Z. (2018). *Demographic and human development in the Middle East and North Africa*. Bamberg: University of Bamberg Press. https://doi.org/10.20378/irbo-50993

Gebel, M., and Heyne, S. (2014). *Transitions to adulthood in the Middle East and North Africa: Young women's rising?* Basingstoke: Palgrave Macmillan.

Gipson, J. D., Koenig, M. A., and Hindin, M. J. (2008). The effects of unintended pregnancy on infant, child, and parental health: A review of the literature. *Studies in Family Planning*, *39*(1), 18–38. https://doi.org/10.1111/j.1728-4465.2008.00148.x

Haghighat, E. (2018). *Demography and democracy. Transitions in the Middle East and North Africa*. Cambridge: Cambridge University Press.

Haque, R., Alam, K., Rahman, S. M., Keramat, S. A., and Al-Hanawi, M. K. (2021). Women's empowerment and fertility decision-making in 53 low and middle resource countries: a pooled analysis of demographic and health surveys. *BMJ Open*, *11*(6), 1–12. https://doi.org/10.1136/bmjopen-2020-045952

Henry, H. M. (2011). Egyptian women and empowerment: A cultural perspective. *Women's Studies International Forum*, *34*(3), 251–259. https://doi.org/10.1016/j.wsif.2011.03.001

Higher Population Council [Jordan] (2013). *National reproductive health/Family planning strategy 2013-2017*. Amman, Jordan: Higher Population Council. https://data2.unhcr.org/en/documents/download/39905

Hoodfar, H. (1997). *Between marriage and the market: Intimate politics and survival in Cairo*.

Berkeley: University of California Press.

James-Hawkins, L., Peters, C., VanderEnde, K., Bardin, L., and Yount, K. M. (2016). Women's agency and its relationship to current contraceptive use in lower- and middle-income countries: A systematic review of the literature. *Global Public Health*, *13*(7), 843–858.

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, *30*(3), 435–464. https://doi.org/10.1111/1467-7660.00125

Kandiyoti, D. (1988). Bargaining with patriarchy. *Gender and Society*, *2*(3), 274–290. https://doi.org/10.1177/089124388002003004

Kishor, S. (2000). Empowerment of women in Egypt and links to the survival and health of their infants. In H. Presser and G. Sen (Eds.), *Women's empowerment and demographic processes* (pp. 119–156). Oxford/New York: Oxford University Press.

Krafft, C., Assaad, R., and Keo, C. (2022). The evolution of labor supply in Egypt, 1988–2018. A gendered analysis. In C. Krafft and R. Assaad (Eds.), *The Egyptian labor market: A focus on gender and vulnerability* (pp. 13–48). Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780192847911.003.0002

Krafft, C., Kula, E., and Sieverding, M. (2021). An investigation of Jordan's fertility stall and resumed decline: The role of proximate determinants. *Demographic Research*, *45*(19), 605–652. https://doi.org/10.4054/DEMRES.2021.45.19

Lundberg, S., and Pollak, R. A. (1996). Bargaining and distribution in marriage. *Journal of Economic Perspectives*, *10*(4), 139–158. https://doi.org/10.1257/jep.10.4.139

Malhotra, A., and Schuler, S. R. (2005). Women's empowerment as a variable in international development. In D. Narayan (Ed.), *Measuring empowerment: Cross-disciplinary perspectives* (pp. 71–88). Washington, DC: World Bank.

Mason, K. O. (1986). The status of women: Conceptual and methodological issues in demographic studies. *Sociological Forum*, *1*(2), 284–300. https://doi.org/10.1007/BF01115740

Mason, K. O. (1987). The impact of women's social position on fertility in developing countries. *Sociological Forum*, *2*(4), 718–745.

Miller, W. B. (2011). Differences between fertility desires and intentions: implications for theory, research and policy. *Vienna Yearbook of Population Research, 9*, 75–98.

Miller, W. B., and Pasta, D. J. (1995). Behavioral intentions: Which ones predict fertility behavior in married couples? *Journal of Applied Social Psychology, 25*(6), 530–555. https://doi.org/10.1111/j.1559-1816.1995.tb01766.x

Miller, W. B., Severy, L. J., and Pasta, D. J. (2004). A framework for modelling fertility motivations in couples. *Population Studies, 58*(2), 193-205. https://doi.org/10.1080/0032472042000213712

Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], and ICF International (2015b). *Egypt Health Issues Survey 2015*. Cairo, Egypt/Rockville, Maryland, USA: Ministry of Health and Population and ICF International.

Moghadam, V. M. (2004). Patriarchy in transition: Women and the changing family in the Middle East. *Journal of Comparative Family Studies*, *35*(2), 137–162. https://doi.org/10.3138/JCFS.35.2.137

Moghadam, V. M. (2020). Gender regimes in the Middle East and North Africa: The power of feminist movements. *Social Politics*, *27*(3), 467–485. https://doi.org/10.1093/sp/jxaa019

OAMDI (2018). *Labor Market Panel Surveys (LMPS), http://erf.org.eg/data-portal/. Version 3.0 of Licensed Data Files; ILMPS.* Egypt: Economic Research Forum (ERF).

Philipov, D., and Bernardi, L. (2011). Concepts and operationalisation of reproductive decisions: Implementation in Austria, Germany and Switzerland. *Comparative Population Studies, 36*(2–3), 495–530. https://doi.org/10.4232/10.CPoS-2011-14en

Prata, N., Fraser, A., Huchko, M. J., Gipson, J. D., Withers, M., Lewis, S., … Upadhyay, U. D. (2017). Women's empowerment and family planning: A review of the literature. *Journal of Biosocial Science*, *49*(6), 713–743. https://doi.org/10.1017/S0021932016000663

Pratley, P. (2016). Associations between quantitative measures of women's empowerment and access to care and health status for mothers and their children: A systematic review of evidence from the developing world. *Social Science and Medicine*, *169*, 119–131. https://doi.org/10.1016/j.socscimed.2016.08.001

Puschmann, P., and Matthijs, K. (2015). The demographic transition in the Arab world: The dual role of marriage in family dynamics and population growth. In K. Matthijs, K. Neels, C. Timmerman, J. Haers, and S. Mels (Eds.), *Population change in Europe, the Middle-East and North Africa* (pp. 119–165). Farnham: Ashgate.

Rashad, H., and Osman, M. (2003). Nuptiality in Arab countries: Changes and implications. In N. Hopkins (Ed.), The new Arab family (pp. 20–44). Cairo/New York: The American University in Cairo Press.

Rashad, H., Osman, M., and Roudi-Fahimi, F. (2005). *Marriage in the Arab world*. Washington, DC: Population Reference Bureau. https://www.prb.org/resources/marriage-in-the-arab-world/

Reed, M. N. (2021). Reproductive transitions and women's status in Indian households.

Population Studies, *75*(3), 325–341. https://doi.org/10.1080/00324728.2021.1904147

Richardson, R. A. (2018). Measuring women's empowerment: A critical review of current practices and recommendations for researchers. *Social Indicators Research*, *137*(2), 539–557. https://doi.org/10.1007/s11205-017-1622-4

Rutstein, S. O., and Shah, I. H. (2004). *Infecundity, infertility, and childlessness in developing countries*. DHS Comparative Reports No. 9. Calverton, Maryland, USA: ORC Macro and the World Health Organization. https://dhsprogram.com/pubs/pdf/CR9/CR9.pdf

Safilios-Rothschild, C. (1970). The study of family power structure: A review 1960-1969. *Journal of Marriage and Family*, *32*(4), 539–552.

Salem, R., Cheong, Y. F., Miedema, S. S., and Yount, K. M. (2020). Women's agency in Egypt: construction and validation of a multidimensional scale in rural Minya. *Eastern Mediterranean Health Journal*, *26*(6), 652–659. https://doi.org/10.26719/2020.26.6.652

Samari, G. (2017a). First birth and the trajectory of women's empowerment in Egypt. *BMC Pregnancy and Childbirth*, *17*(Suppl 2), 43–55. https://doi.org/10.1186/s12884-017-1494-2

Samari, G. (2017b). Women's agency and fertility: Recent evidence from Egypt. *Population Research and Policy Review*, *36*(4), 561–582. https://doi.org/10.1007/s11113-017-9427-3

Samari, G. (2019). Women's empowerment in Egypt: the reliability of a complex construct. *Sexual and Reproductive Health Matters*, *27*(1). https://doi.org/10.1080/26410397.2019.1586816

Samman, E., and Santos, M. E. (2009). *Agency and empowerment: a review of concepts, indicators and empirical evidence*. Oxford: Oxford Poverty and Human Development Initiative, University of Oxford. https://doi.org/10.5325/j.ctv14gpckz.16

Schoumaker, B. (2019). Stalls in fertility transitions in sub-Saharan Africa: Revisiting the evidence. *Studies in Family Planning*, *50*(3), 257–278. https://doi.org/10.1111/sifp.12098

Selwaness, I., and Krafft, C. (2021). The dynamics of family formation and women's work: What facilitates and hinders female employment in the Middle East and North Africa? *Population Research and Policy Review*, *40*(3), 533–587. https://doi.org/10.1007/s11113-020-09596-6

Shroff, M. R., Griffiths, P., Adair, L., Suchindran, C., and Bentley, M. (2009). Maternal autonomy is inversely related to child stunting in Andhra Pradesh, India. *Maternal and Child Nutrition*, *5*(1), 64–74. https://doi.org/10.1111/j.1740-8709.2008.00161.x

Shroff, M. R., Griffiths, P. L., Suchindran, C., Nagalla, B., Vazir, S., and Bentley, M. E. (2011). Does maternal autonomy influence feeding practices and infant growth in rural India?

Social Science and Medicine, *73*(3), 447–455. https://doi.org/10.1016/j.socscimed.2011.05.040

Singerman, D. (2013). Youth, gender, and dignity in the Egyptian uprising. *Journal of Middle East Women's Studies*, *9*(3), 1–27.

Tabutin, D., Schoumaker, B., Rogers, G., Mandelbaum, J., and Dutreuilh, C. (2005). The demography of the Arab world and the Middle East from the 1950s to the 2000s. A survey of changes and a statistical assessment. *Population*, *60*(5–6), 505–591 and 593–615. https://doi.org/10.2307/4148186

Testa, M. R. (2012). *Family sizes in Europe: Evidence from the 2011 Eurobarometer Survey*. Vienna: Vienna Institute of Demography.

The DHS Program (2020). DHS Model Questionnaire - Phase 8 (English, French). https://dhsprogram.com/publications/publication-DHSQ8-DHS-Questionnaires-and-Manuals.cfm

Thorpe, S., VanderEnde, K., Peters, C., Bardin, L., and Yount, K. M. (2016). The influence of women's empowerment on child immunization coverage in low, lower-middle, and upper-middle income countries: A systematic review of the literature. *Maternal and Child Health Journal*, *20*(1), 172–186. https://doi.org/10.1007/s10995-015-1817-8

United Nations, Department of Economic and Social Affairs, and Population Division (2018). *World Urbanization Prospects: The 2018 Revision*. https://population.un.org/wup/

United Nations, Department of Economic and Social Affairs, and Population Division (2022). *World Population Prospects*. https://population.un.org/wpp/

United Nations Population Fund (2014). *Programme of Action of the International Conference on Population Development*. https://www.unfpa.org/sites/default/files/pub-pdf/programme_of_action_Web ENGLISH.pdf

Upadhyay, U. D., Gipson, J. D., Withers, M., Lewis, S., Ciaraldi, E. J., Fraser, A., … Prata, N. (2014). Women's empowerment and fertility: A review of the literature. *Social Science and Medicine*, *115*, 111–120. https://doi.org/10.1016/j.socscimed.2014.06.014

World Economic Forum (2022). *The Global Gender Gap Report 2023*. Cologny/Geneva: World Economic Forum. http://reports.weforum.org/globalgender-%0Agap-report-2023

Yount, K. M. (2005). Women's family power and gender preference in Minya, Egypt. *Journal of Marriage and Family*, *67*(2), 410–428. https://doi.org/10.1111/j.0022-2445.2005.00125.x

Yount, K. M., Dijkerman, S., Zureick-Brown, S., and VanderEnde, K. E. (2014). Women's empowerment and generalized anxiety in Minya, Egypt. *Social Science and Medicine*,

106, 185–193. https://doi.org/10.1016/j.socscimed.2014.01.022

Yount, K. M., VanderEnde, K. E., Dodell, S., and Cheong, Y. F. (2016). Measurement of women's agency in Egypt: A national validation study. *Social Indicators Research*, *128*(3), 1171–1192. https://doi.org/10.1007/s11205-015-1074-7

Study 1

Women's agency in Egypt, Jordan, and Tunisia: The role of parenthood and education

This study is coauthored with Florian Schulz and Henriette Engelhardt.

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Introduction

Most countries in the world have recognized the importance of women's agency (Klugman et al. 2014), as it has been found to be a relevant predictor of societal development as well as women's and their children's health and well-being (Doan and Bisharat 1990; Kishor 2000; Shroff et al. 2009, 2011; Yount et al. 2014). In Middle Eastern and North African (MENA) countries, women's empowerment and levels of women's agency are low because of deeply entrenched patriarchal norms (e.g., Samari 2017b; Yount et al. 2014). The persistence of low empowerment can be framed with the notion of the "MENA paradox" (Assaad et al. 2018). This concept describes the "peculiar" (Obermeyer 1992) demographic situation that female labor market participation is very low (International Labour Organization 2018) and does not correspond to women's increasing educational attainment and declining fertility rates in the region (World Bank 2013).

Even though total fertility declined considerably over the last decades to about replacement level in Tunisia, and about 3.5 in Egypt and Jordan (Al Zalak and Goujon 2017; Cetorelli and Leone 2012; Eltigani 2009; Engelhardt et al. 2018), motherhood has been almost universal among married women (Gebel and Heyne 2014). Women are ascribed a reproductive role in the MENA region (Miles 2002) and motherhood is regarded as important for a woman's social position (Kandiyoti 1988; Yount 2005). This societal invariant puts the discussion about women's agency directly into the context of parenthood. Yet, there is a considerable gap of knowledge concerning parenthood as a determinant of women's agency in the MENA region. Women's agency is a component of women's empowerment (a process over time including resources, agency, achievements) and refers to women's ability to, "define their own life-choices and to pursue their own goals, even in the face of opposition from others" (Kabeer 1999: 438).

To date, few studies have examined how fertility influences women's agency (Lee-Rife 2010; Ruthbah 2019; Samari 2017a) and only one study analyzed how the birth of children is associated with women's agency in the MENA region, using data from the Egyptian Labor Market Panel Survey (Samari 2017a). Samari (2017a) found that first births and subsequent ones were positively associated with agency regarding decision-making and freedom of movement, but not with financial autonomy.

The present study extends present knowledge from Samari's (2017a) findings in two ways: First, using cross-sectional data from the Integrated Labor Market Panel Surveys

(ILMPS; OAMDI 2018b), it confronts the Egyptian case of parenthood and women's agency with two other MENA countries, Jordan and Tunisia. This is important as the patriarchal context and levels of women's agency differ between MENA countries. The study provides evidence of different dimensions of instrumental agency – involvement in decision-making, access to household money and freedom of movement – as well as single aspects of these dimensions in all three countries. Second, we explore how the association between parenthood and instrumental agency is moderated by women's educational attainment which is regarded a major impetus of agency. This will contribute to the understanding of the conditions under which parenthood and agency are associated.

Background

Women's social position in Egypt, Jordan, and Tunisia

Despite increases of socio-economic development and women's educational attainment, patriarchal values still dominate the MENA region and relegate women to subordinate roles (Kelly 2010). There is a widespread notion that family honor mainly depends on the conformity of women to certain norms (Miles 2002). This notion is based on familial relations that are historically rooted in "classic patriarchy" (Kandiyoti 1988: 274). In the Arab-Islamic family, the man is traditionally responsible for the support and protection of his children and wife, whereas the woman is expected to obey her husband, to bear (preferably male) offspring and to take care of children (Moghadam 2004). This "patriarchal contract" is institutionalized through the modern state in the *Muslim Family Law* or the *Personal Status Code* (Moghadam 2004: 145) which regulates many aspects of family life, such as marriage, divorce, or child custody. Therefore, women's rights are severely restricted.

Comparing Egypt, Jordan, and Tunisia, women in Tunisia have the highest degree of freedom (Kelly 2010) as Tunisia has a "pioneering role in women's issues" (Grami 2008: 350). In contrast, women in Egypt and Jordan are by law required to obey their husbands who may restrict their freedom of movement and access to employment (OECD 2017). In all three countries men are considered the heads of households according to the *Personal Status Codes* (Kelly 2010). The Jordanian *Personal Status Law* stipulates male legal guardianship *(welaya)* over single women until the age of 40 (Husseini 2010). For instance, Jordanian women need the consent of their male guardian (mostly father) to marry (OECD 2017). Only Tunisian men and women have equal rights to seek a divorce (Salem 2010). In Egypt and Jordan, a husband

can divorce his wife unilaterally, whereas women must choose between a fault-based divorce and *khul'*. A woman who is divorced through *khul*' does not have to prove the fault of her husband but is required to compensate him (OECD 2017).

Despite fundamental achievements in human development (World Bank 2013), the Global Gender Gap Report 2018 ranked Tunisia, Egypt, and Jordan 119, 135, and 138 out of 149 countries, respectively (World Economic Forum 2018), indicating different and particularly low levels of gender equality in these countries. The *Social Institutions and Gender Index* classified Tunisia as *medium* in gender inequality, while Jordan and Egypt were classified as *high* and *very high* (Social Institutions and Gender Index 2014). In MENA countries, domestic violence and sexual harassment remain a serious concern in women's lives (Boy and Kulczycki 2008; Kelly 2010). Only few women own land and it is common that they only inherit half the share of the male heirs (Social Institutions and Gender Index 2014). Women are strongly underrepresented in powerful positions in politics and companies, and the female labor force participation rates remain the lowest in the world as women only represent 22% of the MENA labor force (Lundvall et al. 2017). Jordan has the lowest female labor market participation rate worldwide (2017: 14%) for a country not at war (World Bank 2018). Women in the MENA region are usually not expected to work and be financially independent. Their earnings are considered an additive but not relevant part of the household income (Hoodfar 1997).

Women's agency in the MENA region

Women's agency is a multi-dimensional and context-specific construct (Kabeer 1999; Yount et al. 2016). In the literature, the terms agency, autonomy or empowerment are often used interchangeably (Thorpe et al. 2016). Following Kabeer's (1999) definition (see introduction), we regard women's agency as a component of women's empowerment. In the process of empowerment, women acquire resources (especially education) which serve to enhance their agency and achievements, for example on the labor market (Kabeer 1999). To include the multidimensionality of women's agency in our analysis, we consider several dimensions that are common measures and direct indicators of agency (Richardson 2018; Thorpe et al. 2016; Cheong et al. 2017; Yount et al. 2016): decision-making, freedom of movement, and financial autonomy. In this study, women's agency is confined to instrumental agency, setting aside intrinsic agency, like gender role attitudes.

The patriarchal context yields low levels of women's agency throughout the MENA region. Considering men as heads of households, viewing women as a protected group, and the dependence of family honor on women's norm conformity restricts women's freedom of movement, their involvement in decision-making, and their financial autonomy. For example, in 2005, in Minya (Egypt), less than 15% of ever-married women reported to decide on their own about their healthcare or visits to family or friends (Yount et al. 2014). Linos et al. (2010) found that in Jordan, in 2002, 12% of currently married women had no final voice on any decision about their own health, large or daily household purchases, visits, and daily meals. Using data of the Tunisian Labor Market Panel Survey of 2014, Assaad et al. (2017) found that involvement in household decisions is higher among women in urban areas than among women living in rural areas and that women's freedom of movement varies strongly in different regions. However, in no region or area are the majority of women allowed to move independently (Assaad et al. 2017). Samari (2017b) and Samari and Pebley (2018) showed that, for Egypt, living region and urbanity were positively associated with women's agency and fertility.

Further, studies have found that women's agency varies by women's educational attainment (Samari and Pebley 2018; Yount 2005), as education may equip women with greater negotiation skills and motivation to maintain or improve their agency. Moreover, it is likely that patriarchal forms of marriage in the MENA region, such as consanguinity and child marriage have negative implications on women's agency. Research has shown that women who marry young tend to have lower agency and to be more dependent on their husbands than those who marry older (Jensen and Thornton 2003).

Despite the normative power of the region's patriarchal context, women in the MENA region were found to be inclined to have (more) agency (Drolet 2010; Mensch et al. 2003). For example, a majority of young unmarried Egyptian women want to be involved in family decisions (Mensch et al. 2003). Further, the study of Samari and Pebley (2018) showed that women's agency is not stable but changes over time.

Previous research on women's agency and parenthood

To the best of our knowledge, only three studies have analyzed the effect of fertility on women's agency (Lee-Rife 2010; Ruthbah 2019; Samari 2017a) and only one of them was conducted in a MENA country (Samari 2017a). In contrast, a large body of research in developing countries has explored whether women's agency affects the use of contraceptives and fertility (reviewed

in Prata et al. 2017; Upadhyay et al. 2014). The evidence is mixed: depending on the context and the measurement of agency, studies have found positive or negative associations. Most of these studies cover South Asian or sub-Saharan African countries and only very few have focused on the MENA region where women's roles are quite different. Further, almost all of these studies are cross-sectional, which makes it difficult to understand the direction of the relation between women's agency and fertility. Samari (2017b) performed one of the first analyses with longitudinal data in the MENA region, investigating the effect of women's agency on fertility outcomes in Egypt with data from the 2006 and 2012 ELMPS. Contrary to the author's expectation, the study's results indicated a positive impact of women's agency on fertility.

Drawing on the seminal work of Samari (2017a), the present study is only the second to consider women's agency as a consequence of parenthood in the MENA region. Yet, it is the first that studied the association of parenthood and women's agency in more than one MENA country for aggregate dimensions as well as for single aspects of agency and how these associations are moderated by women's educational attainment.

Theoretical considerations and hypotheses

Theories of how women's agency could affect fertility include the assumption that women with agency have a voice in fertility decisions (Samari 2019). But how could the reverse effect of parenthood on women's agency be explained? In the literature, it is assumed that fertility could affect women's agency because reproductive capacity is a central part of a woman's identity in most societies (Lee-Rife 2010; Samari 2017a). We provide a theoretical justification for an association between parenthood and women's agency that builds upon this assumption.

Many longitudinal studies conducted in a Western context have shown that the gender division of labor within a partnership becomes more traditional after the transition to parenthood (Baxter et al. 2008). One explanation for this is based on changes in bargaining power after the transition to parenthood. According to classical resource theory, the partner with the most valued resources has more power over the other within a marriage. Resources, in this context, are broadly defined as "anything that one partner may make available to the other, helping the latter satisfy his needs or attain his goals" (Blood and Wolfe 1965: 12). In the context of the MENA region, motherhood can be regarded as a resource, as motherhood is very important for a woman's social position within the family (Kandiyoti 1988; Yount et al. 2016).

Due to the traditional gender division of responsibilities, being a mother opens new possibilities for power compared to childless wives. According to Heer (1963), a major resource of a woman is her ability to adequately fulfil her role as mother to children. Henry (2011: 258) found that Egyptian women, "hesitated to challenge fixed role stereotypes […] because this would mean giving up the only form of power they could have".

Agency is not fixed but can be negotiated. Since the transition to parenthood is a crucial life event that comes along with major changes, it triggers processes of negotiating power within marriage. A woman's social status improvement combined with the tasks she is expected to fulfil in her role as mother gives her the possibility to expand her instrumental agency in such negotiation processes. More specifically, a woman can argue that she needs more freedom for fulfilling these household tasks, to ensure a functioning everyday family life and take good care of the children. Therefore, our central hypothesis is that parenthood is positively associated with women's instrumental agency (H1).

According to bargaining models, education increases a woman's bargaining power (Kantor 2003; McElroy 1990). Therefore, we first expect women with higher education to realize higher levels of instrumental agency in all three countries compared to women with lower education (H2a). This argument is supported by the findings that show level differences of women's agency in educational attainment (Samari and Pebley 2018; Yount 2005). Second, we hypothesize that the positive association between parenthood and agency (if there is any) differs by women's educational level. We expect it to be stronger for women with higher educational attainment than for women with lower educational attainment (H2b). Due to greater bargaining skills, it should be easier for higher educated women to use the resource of motherhood in order to expand their instrumental agency, and therefore they may attain a higher increase in agency than lower educated women.

Method

Data and sample

We used data from the Integrated Labor Market Panel Surveys (ILMPS) (OAMDI 2018b) that include harmonized data from all panel waves of the national Labor Market Panel Surveys (LMPS) in Egypt, Jordan, and Tunisia. The LMPS are nationally representative samples of households in these three countries which survey labor market and demographic information

over time, including information on several dimensions of women's agency. Within the ILMPS, we used the most recent data for each country: Egypt 2012, Jordan 2016, and Tunisia 2014.

We restricted each country sample to married women aged 18-49 (Egypt: n=8,794; Jordan: n=4,716; Tunisia: n=2,103) because comparable information on fertility and agency for all countries is only available for married women in this age range. We removed cases that had missing values on parenthood, any item of women's agency or any control variable: The final analytic samples comprise information on 7,622 women in Egypt, 4,550 women in Jordan, and 1,480 women in Tunisia.

Measures of women's agency

The ILMPS includes information on three different dimensions of women's instrumental agency: (1) involvement in decision-making, (2) financial autonomy, and (3) freedom of movement. Information on intrinsic agency, such as gender role attitudes, is not included in the ELMPS 2012 or TLMPS 2014.

Involvement in decision-making was measured with six variables. Women were asked who in the family usually has the final voice on a number of decisions: (1) making large household purchases; (2) making household purchases for daily needs; (3) visits to family, friends, or relatives; (4) what food should be cooked each day; (5) getting medical treatment or advice for oneself; (6) buying clothes for oneself. Response options for all items were: "respondent alone"; "husband"; "respondent and husband jointly"; "in-laws"; "respondent, husband, and in-laws jointly"; "others"; "not applicable" (coded as missing). We recoded this scale into a binary variable for each item, indicating whether or not the woman is involved in the decision. Additionally, we created a count variable that captures the number of decisions in which the woman is involved (range: 0-6). All items loaded on one factor, and the internal consistency of the scale was acceptable (Egypt: $\alpha = 0.82$; Jordan: $\alpha = 0.84$; Tunisia: $\alpha = 0.76$).

Financial autonomy was measured with the single-item question "Do you have direct access to household money in your hand to use?" Replies were coded binary as yes/no.

Freedom of movement was measured with three items. Women were asked if they can't go alone, need permission, only have to inform, or can go without permission to a number of places. For our analysis, we selected as target places: (1) local market, (2) local health center or doctor, (3) home of relatives, friends, or neighbors. The binary dependent variable discerned

"can't go alone or need permission" versus "only have to inform or can go without permission"; "not applicable" was coded as missing. Again, we created a count variable, measuring the number of places the woman only has to inform or can go without permission (range: 0-3). All items loaded on one factor, and the internal consistency of the scale was acceptable (Egypt: $\alpha = 0.71$; Jordan: $\alpha = 0.87$; Tunisia: $\alpha = 0.80$).

Predictor and moderator

The main predictor, parenthood, was a dichotomous variable: a woman was coded as childless if she had never given birth. If a woman had ever given birth and if that birth or at least one of these births was a live birth, she was coded as having at least one child. As the ILMPS does not include information as to whether a woman had ever given birth, we added it from the separate datasets ELMPS 2012 (OAMDI 2016b), JLMPS 2016 (OAMDI 2018a), and TLMPS 2014 (OAMDI 2016a).

The moderating variable, educational attainment, was measured as the stage of education the woman attended in her last year of schooling, grouped in three categories: (1) no more than basic education, (2) secondary education, and (3) post-secondary education. We refer to "no more than basic education" as lower education and to "secondary education" and "post-secondary education" as higher education.

Controls

Our models controlled for variables known to be associated with variations in women's agency and parenthood: age, age-squared (divided by 100), education, ever worked (yes/no), region of residence, living in urban area (yes/no), husband is related by blood (yes/no), and age at first marriage. To reduce missing values for age at first marriage and if the woman is related by blood to her husband, we added this information for Egypt from the ELMPS 2006 (OAMDI 2016b). Region of residence differs by country; Egypt: Lower Egypt, Upper Egypt; Jordan: North, Middle, South; Tunisia: North, North West, Center East, Center West, South East, South West.

Analytic strategy

We applied multivariate negative binomial regression models to estimate the dimensions "involvement in decision-making" and "freedom of movement" using the count variables as outcomes (Table 2). Additionally, we applied multiple logistic regression models to estimate married women's involvement in decision-making, financial autonomy, and freedom of movement, running separate models for each country and for each item of all dimensions of women's agency (10 models for each country). We reported average marginal effects (AMEs) for each model in Tables A3-A5 in the Appendix to this article. For the purpose of visualization, and to show level differences between the dimensions and items of women's agency between the three countries, we plotted predicted probabilities with 90%-confidence intervals (due to small sample size) in Figure 1.

Results

Descriptive results

Table 1 shows the descriptive statistics on women's agency, parenthood, education, and all control variables. In all three countries, about 90% of all women have at least one child. Women in the sample of Tunisia are slightly older and less educated than women in Egypt and Jordan. 84% of all Tunisian women do not have more than basic education. Jordanian women are more highly educated than women in Egypt: 30% of all women have post-secondary education compared to 19% in Egypt. In Tunisia, 37% of all women have been employed compared to 16% in Jordan. The low share of women who have been employed in Jordan stands in opposition to the relatively high share of Jordanian women with post-secondary education. In Tunisia, fewer women are related by blood to their husband and the mean age at first marriage is higher than in Egypt and Jordan. In Jordan, 75% of all women live in urban areas which is much higher than in Tunisia and Egypt (both 42%).

Table 1: Descriptive statistics on women's agency, parenthood, and control variables. Integrated Labor Market Panel Surveys (Egypt 2012, Jordan 2016, Tunisia 2014).

	Egypt (n = 7,622)	Jordan (n = 4,550)	Tunisia (n = 1,480)	Country differences[a]
Women's agency				
Involvement in decision-making				
Large household purchases	.550	.788	.720	a, b, c
Daily need household purchases	.746	.683	.618	a, b, c
Visits to family or friends	.715	.875	.885	a, c
Food cooked each day	.831	.906	.891	a, c
Getting medical treatment	.766	.909	.920	a, c
Buying clothes	.793	.928	.916	a, c
Count	4.400 (1.879)	5.087 (1.564)	4.949 (1.470)	a, b, c
Access to household money	.589	.264	.528	a, b, c
Freedom of movement				
To the market	.350	.100	.267	a, b, c
To the doctor	.168	.100	.255	a, b, c
To relatives, friends, or neighbors	.183	.103	.251	a, b, c
Count	0.700 (0.989)	0.303 (0.803)	0.772 (1.106)	a, b, c
Main predictor				
Parenthood	.889	.892	.905	
Controls				
Age	30.860 (7.846)	33.401 (8.338)	37.201 (7.578)	a, b, c
Education				
Not more than basic	.422	.551	.840	a, b, c
Secondary	.387	.148	.078	a, b, c
Post-secondary	.191	.300	.082	a, b, c
Ever worked	.270	.161	.370	a, b, c
Age at first marriage	20.792 (3.814)	21.765 (4.649)	24.032 (5.335)	a, b, c
Husband related by blood	.298	.285	.237	b, c
Urban	.417	.747	.415	a, b
Region				
Egypt				
Lower Egypt	.601	-	-	
Upper Egypt	.399	-	-	
Jordan				
Middle	-	.454	-	
North	-	.388	-	
South	-	.158	-	
Tunisia				
North	-	-	.296	
North West	-	-	.164	
Center East	-	-	.218	
Center West	-	-	.184	
South East	-	-	.103	
South West	-	-	.037	

Notes: [a] 'a' denotes differences between Egypt and Jordan, 'b' between Jordan and Tunisia, and 'c' between Egypt and Tunisia which are significantly different from zero (two-sample t-tests; $p<0.5$); Proportions or means, standard deviations in parentheses.

There is statistically significant regional heterogeneity between the dimensions of women's agency. The number of decisions a woman is involved in is higher in Jordan than in Egypt and Tunisia, however, the share of women who have access to household money and the number of places to which a woman can move freely is much lower in Jordan than in Egypt and Tunisia. In Tunisia, women's involvement in decision-making and freedom of movement is higher than in Egypt, whereas the share of women who have access to household money is lower than in Egypt.

Table 1 also shows within-country level differences between the dimensions of agency and between the items of each dimension: While the share of women who are involved in decision-making is above 70% for most items, the share of women who can move freely is below 50% in all countries and only 10% in Jordan. In Egypt, women's freedom of movement to the market is much higher than freedom of movement to the doctor or friends, and in all countries women's involvement in decision-making about household purchases is lower than women's involvement in other decisions.

Results from multivariate analysis

Table 2 shows the results of the multivariate negative binomial regression models of involvement in decision-making and freedom of movement and the results of the multivariate logistic regression models of access to household money. Figure 1 shows predicted probabilities of all single items of women's agency for childless women and women with children by parenthood, which were derived from the logistic regression models in Tables A3-A5 (AMEs) in the Appendix by setting all covariates at their observed values (Williams 2012).

Involvement in decision-making

The results in Table 2 show positive but not significant associations between parenthood and involvement in decision-making in Egypt and Tunisia. In Jordan, the association is negative and also not significant.

Figure 1 reveals strong, positive significant associations between parenthood and the decision about daily need household purchases in Egypt and Tunisia: Egyptian mothers' predicted probability was 4 percentage points (p.p.) higher compared to childless women ($p<0.05$), and in Tunisia, mothers' predicted probability to be involved in this decision was

9 p.p. higher than for childless women ($p<0.1$). Further, there are notable differences in predicted probabilities regarding the decision about what food to be cooked (8 p.p.; $p<0.05$) and large household purchases (5 p.p.) in Tunisia.

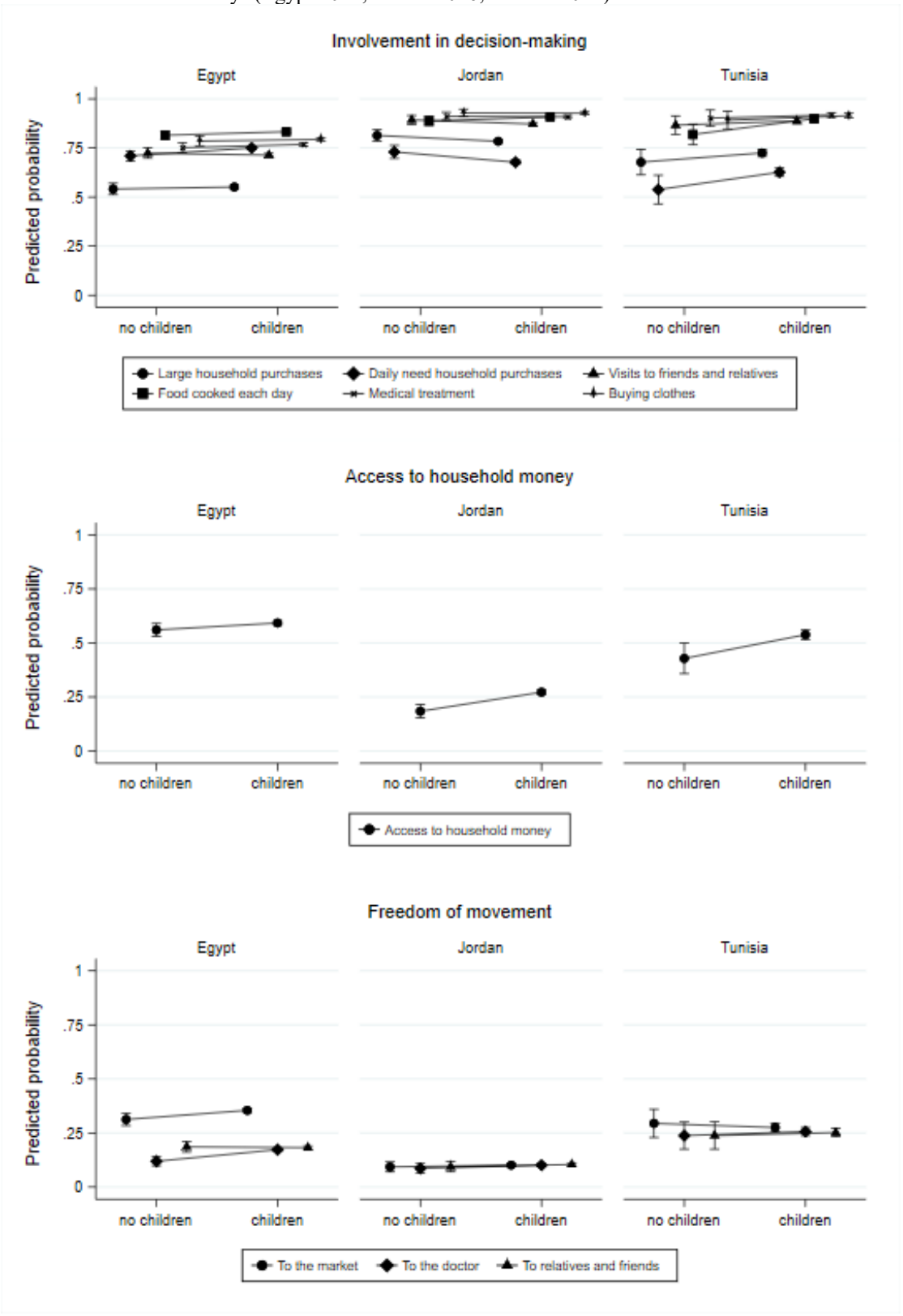
Figure 1 shows negative associations for the decision about large and daily need household purchases in Jordan: women with children have a 5 p.p. lower predicted probability to be involved in the decision about daily need purchases and a 3 p.p. lower predicted probability to be involved in the decision about large purchases. For the decision about daily need purchases, the AME is significant ($p<0.05$).

Table 2: Coefficient estimates for parenthood and education from multivariate negative binomial regression models (involvement in decision-making and freedom of movement) and from multivariate logistic regression models (access to household money). Integrated Labor Market Panel Surveys (Egypt 2012, Jordan 2016, Tunisia 2014).

	Involvement in decision-making			Access to household money			Freedom of movement		
	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia
Without interaction term between parenthood and education									
Parenthood [a]	0.020	-0.018	0.061	0.138^{+}	0.533***	0.487*	0.146*	0.128	0.013
	(0.019)	(0.022)	(0.045)	(0.082)	(0.134)	(0.204)	(0.063)	(0.164)	(0.148)
Education [b]									
Secondary	0.070***	0.072***	0.041	0.089	0.255*	0.251	0.007	0.248	0.033
	(0.013)	(0.019)	(0.044)	(0.057)	(0.104)	(0.219)	(0.040)	(0.133)	(0.148)
Post-secondary	0.098***	0.083***	0.087*	0.231**	0.331***	0.058	-0.006	0.114	0.207
	(0.017)	(0.017)	(0.044)	(0.078)	(0.088)	(0.219)	(0.054)	(0.122)	(0.148)
Observations	7,622	4,550	1,480	7,622	4,550	1,480	7,622	4,550	1,480
With interaction term between parenthood and education									
Parenthood	0.071*	-0.026	0.053	0.228^{+}	0.673***	0.459*	0.111	0.189	-0.029
	(0.033)	(0.029)	(0.049)	(0.130)	(0.196)	(0.223)	(0.101)	(0.219)	(0.162)
Education									
Secondary	0.119**	0.068	0.060	0.089	0.475	-0.058	-0.215	0.350	0.146
	(0.041)	(0.063)	(0.140)	(0.164)	(0.387)	(0.650)	(0.135)	(0.455)	(0.469)
Post-secondary	0.187***	0.064	0.016	0.543**	0.584*	0.067	0.135	0.240	-0.285
	(0.044)	(0.045)	(0.127)	(0.191)	(0.272)	(0.594)	(0.139)	(0.334)	(0.462)
Parenthood*Education									
Parenthood*Secondary	-0.054	0.005	-0.020	0.000	-0.237	0.348	0.242^{+}	-0.112	-0.124
	(0.043)	(0.066)	(0.147)	(0.174)	(0.400)	(0.688)	(0.140)	(0.474)	(0.494)
Parenthood*Post-secondary	-0.102*	0.022	0.081	-0.367^{+}	-0.277	-0.011	-0.167	-0.140	0.546
	(0.046)	(0.047)	(0.134)	(0.202)	(0.282)	(0.633)	(0.146)	(0.349)	(0.484)
Observations	7,622	4,550	1,480	7,622	4,550	1,480	7,622	4,550	1,480

Notes: Reference categories: [a] No children, [b] No more than basic education; Models controlled for education, age, age squared/100, ever worked, age at first marriage, husband related by blood, region, urban; Full models are presented in Tables A1 and A2 in the Appendix; *** $p<0.001$, ** $p<0.01$, * $p<0.05$, $^{+}$ $p<0.1$, standard errors in parentheses.

Figure 1: Predicted probabilities of women's agency in Egypt, Jordan, and Tunisia, by parenthood. Integrated Labor Market Panel Surveys (Egypt 2012, Jordan 2016, Tunisia 2014).



Notes: Predicted probabilities with 90%-confidence intervals. The predictions were derived from Tables A3-A5 in the Appendix. Models controlled for education, age, age squared/100, ever worked, age at first marriage, husband related by blood, region, urban; covariates were kept at their observed values.

Financial autonomy

Table 2 and Figure 1 show positive, significant associations between parenthood and access to household money in all three countries. In Tunisia, the predicted probability is 11 p.p. higher for mothers than for childless women ($p<0.05$). This difference is greater than in Egypt (3 p.p.; $p<0.1$) and Jordan (9 p.p.; $p<0.001$).

Freedom of movement

Table 2 shows positive associations between parenthood and freedom of movement in all three countries (significant only in Egypt; $p<0.05$).

Figure 1 shows significant positive associations between parenthood and freedom of movement to the market and to the doctor in Egypt: Compared to childless women, mothers have a 4 p.p. higher predicted probability to go to the market independently ($p<0.05$) and a 5 p.p. higher predicted probability to go to the doctor independently ($p<0.001$). In Jordan and Tunisia, we find positive associations between parenthood and freedom of movement, except for going to the market in Tunisia (Figure 1). These associations are weak and not significant.

The role of education

Table 2 shows positive, significant associations between having post-secondary education and involvement in decision-making in all three countries and in Egypt and Jordan also for access to household money. There is no positive, significant association between having higher education and freedom of movement in all three countries.

To explore how the association between parenthood and women's agency is moderated by women's educational attainment, we included interaction terms between parenthood and education in the models (see lower part of Table 2). Results for Jordan and Tunisia must be interpreted carefully, as the number of cases is rather low, especially for childless women with post-secondary education. In most models, the interaction effects of parenthood and education are not significant. However, in Egypt, Table 2 shows a significant negative association between parenthood and involvement in decision-making and access to household money for women with post-secondary education ($p<0.05$ and $p<0.1$, respectively). For freedom of movement the association for Egyptian women with post-secondary education is negative, but not significant.

Discussion

The present study was the first to explore the association between parenthood and women's agency in different countries of the MENA region. It furthered the study of Samari (2017a) by comparing this association in different MENA countries that are heterogeneous in their levels of women's agency and by exploring how the relationship is moderated by educational attainment. Many of the results of our study supported our central hypothesis that parenthood is positively associated with women's instrumental agency (H1). This supported our argument that parenthood triggers negotiation processes that may increase mothers' agency based on a status increase and the social expectation to adequately fulfill the mother-role.

Three results stood out: First, we found a positive association between parenthood and financial autonomy in all three countries, although the strength of this association differs between countries (higher AME in Tunisia than in Jordan and higher AME in Jordan than in Egypt). Second, we found positive associations between parenthood and freedom of movement although this was significant only in Egypt. Third, we found mixed results for involvement in decision-making, i.e., significant positive associations for the decision about daily need household purchases in Egypt and Tunisia, but a significant negative association in Jordan. We found no significant association between parenthood and the count variable of involvement in decision-making.

Finding no significant associations for freedom of movement in Jordan and Tunisia and no significant associations for many items of decision-making (even a negative significant association for the decision about daily need household purchases in Jordan) did not support our claim that parenthood helps women to increase their agency.

Overall, our findings were not completely in line with those of Samari (2017a), who did not find a significant association between first birth and financial autonomy in Egypt. However, the AME of parenthood on access to household money in Egypt (0.03) is much smaller than in Jordan (0.09) and Tunisia (0.12) and it is only significant at the 0.10 level. The interplay between parenthood and women's agency in our study is in line with empirical evidence in the western context that parenthood influences gender-role behavior (Baxter et al. 2008). However, it does not align with the results of Lee-Rife (2010), who found no association between reproductive events like unwanted or mistimed pregnancies and women's agency in India.

Our expectation that women with higher education realize higher levels of agency compared to women with lower education (H2a) was confirmed for involvement in decision-

making in all countries and for access to household money in Egypt and Jordan. However, hypothesis H2a was not supported for freedom of movement in all three countries, which is in line with Samari and Pebley's (2018) observation in Egypt. These results may be explained by the strong patriarchal context in the countries under consideration. Patriarchal structures may hinder women's ability to transform their educational resources to improve their agency in all dimensions. Resources have different impacts on women's agency in different social contexts (Hanmer and Klugman 2016): Having children and fulfilling the mother role, which is in line with the patriarchal context, may be a better resource to strengthen women's bargaining power within these patriarchal contexts.

Our hypothesis that the positive association between parenthood and women's agency is stronger for women with higher educational attainment than for women with lower educational attainment (H2b) was not confirmed. Instead, we found significant results that indicate a negative association between parenthood and women's agency for women with post-secondary education in Egypt. Women with very high education may not gain an improvement of bargaining power by having children, as it may weaken their other resources connected to earnings and employment. Women in the MENA region with lower education are less likely to be employed than higher educated women (Gebel and Heyne 2014). While motherhood could mean an increase of women's agency for lower educated women, it may decrease women's agency for higher educated women, as giving birth to the first child could mean a decrease in resources due to lower working hours and earnings, smaller career options or even leaving employment. Therefore, parenthood may only increase a woman's agency in a very patriarchal and gender-traditional setting, where the wife has low or no education, is not employed, and does not seek a professional career.

Due to the patriarchal context and the strong gender division of roles and responsibilities in the MENA region, motherhood is very important for women's social position. If parenthood is tied to women's value or social position, it may increase women's agency. At the same time, it could mean that women's power and freedom is limited to the mother role, which is only a contextual freedom but not an individual freedom. As our analysis showed, education is an important determinant of women's agency, however, support of education or female labor market participation is not enough to significantly enhance women's agency (Assaad et al. 2015). In conclusion, a change in gender norms is needed to support women's agency in all spheres of life. The change from traditional to egalitarian gender role attitudes due to worldwide

modernization processes is, still, less pronounced in the MENA region (Inglehart and Norris 2003).

Limitations and future research on women's agency

Obviously, our study is not without limitations. Most notably, there are two drawbacks concerning the sample size: first, the analytic sample size in Tunisia is much smaller than in Egypt and Jordan, leading to larger confidence intervals in the latter country. Second, the share of women without children is very low in all three samples. As in the MENA region, transition to parenthood usually takes place about one year after marriage (Gebel and Heyne 2014). It seems obvious that only a small share of women do not have children in a sample restricted to married women.

Another major methodological drawback of our study is the cross-sectional design that does not allow us to determine the causal relationship between parenthood and women's agency in the three countries. Current data does not yet support estimating large-scale causal models, though much effort is made to improve the data situation in the MENA region. Currently there are only two panel waves for Jordan and only one panel wave for Tunisia available. Therefore, we were not able to compare the effect of *transition* to parenthood on women's agency between the three countries Egypt, Jordan, and Tunisia. However, Samari (2017a) has used longitudinal data and has found a positive association between first birth and decision-making and freedom of movement in Egypt.

As we found level differences of women's agency and differences in the association with parenthood between Egypt, Jordan, and Tunisia, future studies should explore the reasons for these country differences. Future longitudinal analyses could provide causal evidence for the (different) influence of transition to parenthood on women's agency in the MENA region. In particular, they could provide deeper insight in the mixed results for Jordan. Further, as Lee-Rife (2010) has explored in the context of India, it would be interesting how other reproductive events, e.g. abortion or stillbirths, affect women's agency in the MENA region. Also, in addition to the study of Samari (2017a) that explored the effect of subsequent births on women's agency in Egypt, more knowledge on how the number of children affects women's agency in the MENA region is needed, and how this association differs between countries with different TFRs or different social expectations depending on parity.

Knowledge on changes of women's agency over the life course is important for the development of social policies aiming to increase women's agency. It is up to future longitudinal studies to explore the causal effect of transition to parenthood – a life course transition associated with major changes within marriage and women's daily life – on women's agency in the MENA region.

References

Al Zalak, Z., and Goujon, A. (2017). Exploring the fertility trend in Egypt. *Demographic Research, 37*(1), 995–1030. https://doi.org/10.4054/DemRes.2017.37.32

Assaad, R., Ghazouani, S., and Krafft, C. (2017). *Marriage, fertility, and women's agency in Tunisia*. ERF Working Paper Series No. 1157. Dokki, Egypt: The Economic Research Forum.

Assaad, R., Hendy, R., Lassasi, M., and Yassin, S. (2018). *Explaining the MENA Paradox: Rising educational attainment, yet stagnant female labor force participation*. IZA Discussion Paper Series No. 11385. Bonn: IZA – Institute of Labor Economics.

Assaad, R., Nazier, H., and Ramadan, R. (2015). *Empowerment is a community affair: Community level determinants of married women's empowerment in Egypt*. ERF Working Paper Series No. 959. Dokki, Egypt: The Economic Research Forum.

Baxter, J., Hewitt, B., and Haynes, M. (2008). Life course transitions and housework: Marriage, parenthood, and time on housework. *Journal of Marriage and Family, 70*(2), 259–272. https://doi.org/ht10.1111/j.1741-3737.2008.00479.x

Blood, R. O., and Wolfe, D. M. (1965). *Husbands and wives. The dynamics of married living*. New York: Free Press.

Boy, A., and Kulczycki, A. (2008). What we know about intimate partner violence in the Middle East and North Africa. *Violence Against Women, 14*(1), 53–17. https://doi.org/10.1177/1077801207311860

Cetorelli, V., and Leone, T. (2012). Is fertility stalling in Jordan? *Demographic Research, 26*(13), 293–318. https://doi.org/10.4054/DemRes.2012.26.13

Cheong, Y. F., Yount, K. M., and Crandall, A. A. (2017). Longitudinal measurement invariance of the women's agency scale. *Bulletin de Methodologie Sociologique, 134*(1), 24–36. https://doi.org/10.1177%2F0759106317693787

Doan, R. M., and Bisharat, L. (1990). Female autonomy and child nutritional status: The extended-family residential unit in Amman, Jordan. *Social Science and Medicine, 31*(7),

783–789. https://doi.org/10.1016/0277-9536(90)90173-p

Drolet, J. (2010). Women, micro credit and empowerment in Cairo, Egypt. *International Social Work, 54*(5), 629–645. https://doi.org/10.1177/0020872810382681

Eltigani, E. E. (2009). Toward replacement fertility in Egypt and Tunisia. *Studies in Family Planning, 40*(3), https://doi.org/215–226. 10.1111/j.1728-4465.2009.00204.x

Engelhardt, H., Schulz, F., and Büyükkeçeci, Z. (2018). *Demographic and human development in the Middle East and North Africa*. Bamberg: University of Bamberg Press. https://doi.org/10.20378/irbo-50993

Gebel, M., and Heyne, S. (2014). *Transitions to adulthood in the Middle East and North Africa: Young women's rising?* Basingstoke: Palgrave Macmillan. https://doi.org/10.1057/9781137355560

Grami, A. (2008). Gender equality in Tunisia. *British Journal of Middle Eastern Studies, 35*(3), 349–361. https://doi.org/10.1080/13530190802525148

Hanmer, L., and Klugman, J. (2016). Exploring women's agency and empowerment in developing countries: Where do we stand? *Feminist Economics, 22*(1), 237–263. https://doi.org/10.1080/13545701.2015.1091087

Heer, D. M. (1963). The measurement and bases of family power: A rejoinder. *Marriage and Family Living, 25*(2), 133–139. https://doi.org/10.2307/349050

Henry, H. M. (2011). Egyptian women and empowerment: A cultural perspective. *Women's Studies International Forum, 34*(3), 251–259. https://doi.org/10.1016/j.wsif.2011.03.001

Hoodfar, H. (1997). *Between marriage and the market: Intimate politics and survival in Cairo*. Berkeley: University of California Press.

Husseini, R. (2010). Jordan. In S. Kelly and J. Breslin (Eds.), *Women's rights in the Middle East and North Africa* (pp. 193–222). New York: Freedom House.

Inglehart, R., and Norris, P. (2003). *Rising tide: gender equality and cultural change around the world*. Cambridge: Cambridge University Press.

International Labour Organization (2018). *World employment and social outlook: Trends for women 2018. Global snapshot*. Geneva: International Labour Office.

Jensen, R., and Thornton, R. (2003). Early female marriage in the developing world. *Gender & Development, 11*(2), 9–19. https://doi.org/10.1080/741954311

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change, 30*(3), 435–464. https://doi.org/10.1111/1467-7660.00125

Kandiyoti, D. (1988). Bargaining with patriarchy. *Gender and Society, 2*(3), 274–290.

https://doi.org/10.1177/089124388002003004

Kantor, P. (2003). Women's empowerment through home-based work: Evidence from India. *Development and Change, 34*(3), 425–445. https://doi.org/10.1111/1467-7660.00313

Kelly, S. (2010). Hard-won progress and a long road ahead: Women's rights in the Middle East and North Africa. In S. Kelly and J. Breslin (Eds.), *Women's rights in the Middle East and North Africa* (pp. 1–14). New York: Freedom House.

Kishor, S. (2000). Empowerment of women in Egypt and links to the survival and health of their infants. In H. B. Presser and G. Sen (Eds.), *Women's empowerment and demographic processes: Moving beyond Cairo*. Oxford/New York: Oxford University Press.

Klugman, J., Hammer, L., Twigg, S., Hasan, T., McCleary-Sills, J., and Santamaria, J. (2014). *Voice and agency: Empowering women and girls for shared prosperity*. Washington, DC: International Bank for Reconstruction and Development, The World Bank.

Lee-Rife, S. M. (2010). Women's empowerment and reproductive experiences over the lifecourse. *Social Science & Medicine, 71*(3), 634–642. https://doi.org/10.1016/j.socscimed.2010.04.019

Linos, N., Khawaja, M., and Al-Nsour, M. (2010). Women's autonomy and support for wife beating: Findings from a population-based survey in Jordan. *Violence and Victims, 25*(3), 409–419. https://doi.org/10.1891/0886-6708.25.3.409

Lundvall, J. M., De Paz Nieves, C., Constant, S. M., and Atamanov, A. (2017). *Progress towards gender equality in the Middle East and North Africa region*. Washington, DC: The World Bank.

McElroy, M. B. (1990). The empirical content of Nash-bargained household behavior. *The Journal of Human Resources, 25*(4), 559–583.

Mensch, B. S., Ibrahim, B. L., Lee, S. M., and El-Gibaly, O. (2003). Gender-role attitudes among Egyptian adolescents. *Studies in Family Planning, 34*(1), 8–18. https://doi.org/10.1111/j.1728-4465.2003.00008.x

Miles, R. (2002). Employment and unemployment in Jordan: The importance of the gender system. *World Development, 30*(3), 413–427. https://doi.org/10.1016/S0305-750X(01)00123-1

Moghadam, V. M. (2004). Patriarchy in transition: Women and the changing family in the Middle East. *Journal of Comparative Family Studies, 35*(2), 137–162. https://doi.org/10.3138/JCFS.35.2.137

OAMDI (2016a). *Labor Market Panel Surveys (LMPS), http://erf.org.eg/data-portal/. Version 2.2 of Licensed Data Files; ELMPS 2012.* Egypt: Economic Research Forum (ERF).

OAMDI (2016b). *Labor Market Panel Surveys (LMPS), http://erf.org.eg/data-portal/. Version 4.2 of Licensed Data Files; ELMPS 2006*. Egypt: Economic Research Forum (ERF).

OAMDI (2018a). *Labor Market Panel Surveys (LMPS), http://erf.org.eg/data-portal/. Version 1.1 of Licensed Data Files; JLMPS 2016*. Egypt: Economic Research Forum (ERF).

OAMDI (2018b). *Labor Market Panel Surveys (LMPS), http://erf.org.eg/data-portal/. Version 3.0 of Licensed Data Files; ILMPS*. Egypt: Economic Research Forum (ERF).

Obermeyer, C. M. (1992). Islam, women, and politics. The demography of Arab countries. *Population and Development Review, 18*(1), 33–50. https://doi.org/10.2307/1971858

OECD (2017). *Women's economic empowerment in selected MENA countries. The impact of legal frameworks in Algeria, Egypt, Jordan, Libya, Morrocco and Tunisia*. Paris: Competitiveness and Private Sector Development, OECD Publishing. https://doi.org/10.1787/9789264279322-en

Prata, N., Fraser, A., Huchko, M. J., Gipson, J. D., Withers, M., Lewis, S., … Upadhyay, U. D. (2017). Women's empowerment and family planning: A review of the literature. *Journal of Biosocial Science, 49*(6), 713–743. https://doi.org/10.1017/S0021932016000663

Richardson, R. A. (2018). Measuring women's empowerment: A critical review of current practices and recommendations for researchers. *Social Indicators Research, 137*(2), 539–557. https://doi.org/10.1007/s11205-017-1622-4

Ruthbah, U. (2019). Does lower fertility empower women? Evidence from rural Bangladesh. Economics and Human Biology, 36, 1–10. https://doi.org/10.1016/j.ehb.2019.100813

Salem, L. B. (2010). Tunisia. In S. Kelly and J. Breslin (Eds.), *Women's rights in the Middle East and North Africa: Progress amid resistance* (pp. 487–515). New York: Freedom House.

Samari, G. (2017a). First birth and the trajectory of women's empowerment in Egypt. *BMC Pregnancy and Childbirth, 17*(Suppl 2), 43–55. https://doi.org/10.1186/s12884-017-1494-2

Samari, G. (2017b). Women's agency and fertility: Recent evidence from Egypt. *Population Research and Policy Review, 36*(4), 561–582. https://doi.org/10.1007/s11113-017-9427-3

Samari, G. (2019). Education and fertility in Egypt: Mediation by women's empowerment. *SSM - Population Health, 9*, 1–9. https://doi.org/10.1016/j.ssmph.2019.100488

Samari, G., and Pebley, A. R. (2018). Longitudinal determinants of married women's autonomy in Egypt. *Gender, Place & Culture, 25*(6), 1–22. https://doi.org/10.1080/0966369X.2018.1473346

Shroff, M. R., Griffiths, P., Adair, L., Suchindran, C., and Bentley, M. (2009). Maternal

autonomy is inversely related to child stunting in Andhra Pradesh, India. *Maternal and Child Nutrition, 5*(1), 64–74. https://doi.org/10.1111/j.1740-8709.2008.00161.x

Shroff, M. R., Griffiths, P. L., Suchindran, C., Nagalla, B., Vazir, S., and Bentley, M. E. (2011). Does maternal autonomy influence feeding practices and infant growth in rural India? *Social Science and Medicine, 73*(3), 447–455. https://doi.org/10.1016/j.socscimed.2011.05.040

Social Institutions and Gender Index (2014). Countries/Territories 2014. https://www.genderindex.org/countries-territories-2014/

Thorpe, S., VanderEnde, K., Peters, C., Bardin, L., and Yount, K. M. (2016). The influence of women's empowerment on child immunization coverage in low, lower-middle, and upper-middle income countries: A systematic review of the literature. *Maternal and Child Health Journal, 20*(1), 172–186. https://doi.org/10.1007/s10995-015-1817-8

Upadhyay, U. D., Gipson, J. D., Withers, M., Lewis, S., Ciaraldi, E. J., Fraser, A., … Prata, N. (2014). Women's empowerment and fertility: A review of the literature. *Social Science and Medicine, 115*, 111–120. https://doi.org/10.1016/j.socscimed.2014.06.014

Williams, R. (2012). Using the margins command to estimate and interpret adjusted predictions and marginal effects. *The Stata Journal, 12*(2), 308–331. https://doi.org/10.1177/1536867X1201200209

World Bank (2013). *Opening doors: Gender equality and development in the Middle East and North Africa*. Washington, DC: The World Bank.

World Bank (2018). *Hashemite Kingdom of Jordan: Understanding how gender norms in MNA impact female employment outcomes*. Washington, DC: The World Bank.

World Economic Forum (2018). *The Global Gender Gap Report 2018*. Cologny/Geneva: World Economic Forum. https://www3.weforum.org/docs/WEF_GGGR_2018.pdf

Yount, K. M. (2005). Women's family power and gender preference in Minya, Egypt. *Journal of Marriage and Family, 67*(2), 410–428. https://doi.org/10.1111/j.0022-2445.2005.00125.x

Yount, K. M., Dijkerman, S., Zureick-Brown, S., and VanderEnde, K. E. (2014). Women's empowerment and generalized anxiety in Minya, Egypt. *Social Science and Medicine, 106*, 185–193. https://doi.org/10.1016/j.socscimed.2014.01.022

Yount, K. M., VanderEnde, K. E., Dodell, S., and Cheong, Y. F. (2016). Measurement of women's agency in Egypt: A national validation study. *Social Indicators Research, 128*(3), 1171–1192. https://doi.org/10.1007/s11205-015-1074-7

Appendix

Table A1: Coefficient estimates from multivariate negative binomial regression models (involvement in decision-making and freedom of movement) and from multivariate logistic regression models (access to household money). Without interaction term between parenthood and education. Integrated Labor Market Panel Surveys (Egypt 2012, Jordan 2016, Tunisia 2014).

	Involvement in decision-making			Access to household money			Freedom of movement		
	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia
Parenthood [a]	0.020	-0.018	0.061	0.138^{+}	0.533***	0.487*	0.146*	0.128	0.013
	(0.019)	(0.022)	(0.045)	(0.082)	(0.134)	(0.204)	(0.063)	(0.164)	(0.148)
Education [b]									
Secondary	0.070***	0.072***	0.041	0.089	0.255*	0.251	0.007	0.248	0.033
	(0.013)	(0.019)	(0.044)	(0.057)	(0.104)	(0.219)	(0.040)	(0.133)	(0.148)
Post-secondary	0.098***	0.083***	0.087*	0.231**	0.331***	0.058	-0.006	0.114	0.207
	(0.017)	(0.017)	(0.044)	(0.078)	(0.088)	(0.219)	(0.054)	(0.122)	(0.148)
Age	0.024***	0.014^{+}	0.016	0.062*	0.050	0.083	0.064***	0.189***	0.039
	(0.006)	(0.007)	(0.015)	(0.027)	(0.040)	(0.071)	(0.019)	(0.053)	(0.053)
Age squared/100	-0.028**	-0.018^{+}	-0.022	-0.065	-0.042	-0.115	-0.071*	-0.211**	-0.036
	(0.009)	(0.011)	(0.021)	(0.040)	(0.057)	(0.097)	(0.028)	(0.075)	(0.072)
Ever worked [c]	0.060***	0.047*	0.041	0.530***	0.945***	0.622***	0.230***	0.337*	0.102
	(0.013)	(0.019)	(0.025)	(0.058)	(0.095)	(0.119)	(0.038)	(0.136)	(0.086)
Age at first marriage	-0.001	-0.001	-0.001	-0.011	-0.007	0.004	-0.007	-0.013	-0.004
	(0.002)	(0.002)	(0.002)	(0.008)	(0.009)	(0.011)	(0.005)	(0.011)	(0.008)
Husband related by blood [d]	-0.027*	-0.005	-0.053^{+}	-0.165**	0.244**	-0.124	-0.038	-0.112	-0.037
	(0.013)	(0.015)	(0.029)	(0.054)	(0.077)	(0.134)	(0.039)	(0.105)	(0.103)
Region (Egypt/Jordan/Tunisia) [e] Upper Egypt/North/ North West	-0.190***	-0.008	0.076*	-0.547***	0.312***	-0.027	-0.171***	-0.366***	-0.520***
	(0.012)	(0.015)	(0.037)	(0.051)	(0.078)	(0.176)	(0.037)	(0.102)	(0.122)
- /South/Centre East	-	-0.005	-0.132***	-	0.312**	-0.468**	-	-0.948***	-0.641***
	-	(0.020)	(0.036)	-	(0.102)	(0.163)	-	(0.153)	(0.115)
- / - /Centre West	-	-	0.106**	-	-	-0.533**	-	-	-0.962***
	-	-	(0.036)	-	-	(0.170)	-	-	(0.133)
- / - / South East	-	-	-0.076^{+}	-	-	1.550***	-	-	-0.426**
	-	-	(0.044)	-	-	(0.215)	-	-	(0.140)
- / - / South West	-	-	0.048	-	-	-0.660*	-	-	-2.396***
	-	-	(0.063)	-	-	(0.299)	-	-	(0.434)
Urban [f]	0.071***	0.029^{+}	0.107***	0.296***	0.053	0.654***	-0.029	0.088	0.242**
	(0.012)	(0.016)	(0.026)	(0.052)	(0.082)	(0.125)	(0.036)	(0.110)	(0.087)
Observations	7,622	4,550	1,480	7,622	4,550	1,480	7,622	4,550	1,480
Cragg-Uhler (Nagelkerke)-R^2	0.083	0.016	0.055	0.078	0.083	0.128	0.024	0.036	0.098

Notes: Reference categories: [a] No children, [b] No more than basic education, [c] Never worked, [d] Husband is not related by blood, [e] Lower Egypt/Middle/North, [f] Rural; *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<0.1, standard errors in parentheses.

Table A2: Coefficient estimates from multivariate negative binomial regression models (involvement in decision-making and freedom of movement) and from multivariate logistic regression models (access to household money). With interaction term between parenthood and education. Integrated Labor Market Panel Surveys (Egypt 2012, Jordan 2016, Tunisia 2014).

	Involvement in decision-making			Access to household money			Freedom of movement		
	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia	Egypt	Jordan	Tunisia
Parenthood [a]	0.071*	-0.026	0.053	0.228^{+}	0.673***	0.459*	0.111	0.189	-0.029
	(0.033)	(0.029)	(0.049)	(0.130)	(0.196)	(0.223)	(0.101)	(0.219)	(0.162)
Education [b]									
Secondary	0.119**	0.068	0.060	0.089	0.475	-0.058	-0.215	0.350	0.146
	(0.041)	(0.063)	(0.140)	(0.164)	(0.387)	(0.650)	(0.135)	(0.455)	(0.469)
Post-secondary	0.187***	0.064	0.016	0.543**	0.584*	0.067	0.135	0.240	-0.285
	(0.044)	(0.045)	(0.127)	(0.191)	(0.272)	(0.594)	(0.139)	(0.334)	(0.462)
Parenthood*Education									
Parenthood*Secondary	-0.054	0.005	-0.020	0.000	-0.237	0.348	0.242^{+}	-0.112	-0.124
	(0.043)	(0.066)	(0.147)	(0.174)	(0.400)	(0.688)	(0.140)	(0.474)	(0.494)
Parenthood*Post-Secondary	-0.102*	0.022	0.081	-0.367^{+}	-0.277	-0.011	-0.167	-0.140	0.546
	(0.046)	(0.047)	(0.134)	(0.202)	(0.282)	(0.633)	(0.146)	(0.349)	(0.484)
Age	0.023***	0.014^{+}	0.017	0.059*	0.049	0.080	0.061**	0.189***	0.040
	(0.006)	(0.007)	(0.015)	(0.027)	(0.040)	(0.071)	(0.019)	(0.053)	(0.053)
Age squared/100	-0.027**	-0.018+	-0.023	-0.060	-0.041	-0.112	-0.067*	-0.211**	-0.037
	(0.009)	(0.011)	(0.021)	(0.040)	(0.057)	(0.097)	(0.028)	(0.075)	(0.072)
Ever worked [c]	0.059***	0.047*	0.041	0.531***	0.944***	0.620***	0.231***	0.334*	0.099
	(0.013)	(0.019)	(0.025)	(0.058)	(0.095)	(0.119)	(0.038)	(0.136)	(0.086)
Age at first marriage	-0.001	-0.001	-0.001	-0.010	-0.007	0.004	-0.007	-0.013	-0.004
	(0.002)	(0.002)	(0.002)	(0.008)	(0.009)	(0.011)	(0.005)	(0.011)	(0.008)
Husband related by blood [d]	-0.028*	-0.005	-0.052^{+}	-0.166**	0.244**	-0.124	-0.039	-0.112	-0.036
	(0.013)	(0.015)	(0.029)	(0.054)	(0.077)	(0.134)	(0.039)	(0.105)	(0.103)
Region (Egypt/Jordan/Tunisia) [e]									
Upper Egypt/North/ North West	-0.190***	-0.008	0.076*	-0.546***	0.312***	-0.025	-0.170***	-0.367***	-0.517***
	(0.012)	(0.015)	(0.037)	(0.051)	(0.078)	(0.176)	(0.037)	(0.102)	(0.122)
- /South/Centre East	-	-0.005	-0.132***	-	0.310**	-0.466**	-	-0.947***	-0.640***
	-	(0.020)	(0.036)	-	(0.102)	(0.163)	-	(0.153)	(0.115)
- / - /Centre West	-	-	0.106**	-	-	-0.533**	-	-	-0.958***
	-	-	(0.036)	-	-	(0.170)	-	-	(0.133)
- / - / South East	-	-	-0.076^{+}	-	-	1.548***	-	-	-0.425**
	-	-	(0.044)	-	-	(0.215)	-	-	(0.140)
- / - / South West	-	-	0.046	-	-	-0.657*	-	-	-2.408***
	-	-	(0.063)	-	-	(0.299)	-	-	(0.434)
Urban [f]	0.071***	0.029^{+}	0.107***	0.295***	0.053	0.652***	-0.030	0.087	0.243**
	(0.012)	(0.016)	(0.026)	(0.052)	(0.082)	(0.125)	(0.036)	(0.110)	(0.087)
Observations	7,622	4,550	1,480	7,622	4,550	1,480	7,622	4,550	1,480
Cragg-Uhler (Nagelkerke)-R^2	0.084	0.016	0.055	0.078	0.083	0.128	0.025	0.036	0.099

Notes: Reference categories: [a] No children, [b] No more than basic education, [c] Never worked, [d] Husband is not related by blood, [e] Lower Egypt/Middle/North, [f] Rural.; *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<0.1, standard errors in parentheses.

Table A3: Egypt: Logistic regression models, average marginal effects. Integrated Labor Market Panel Surveys (Egypt 2012, Jordan 2016, Tunisia 2014).

	(1) Decision large purchases	(2) Decision daily need purchases	(3) Decision visits	(4) Decision food cooked each day	(5) Decision medical treatment	(6) Decision buying clothes	(7) Access to household money	(8) Mobility to the market	(9) Mobility to the doctor	(10) Mobility to relatives and friends
Parenthood [a]	0.010	0.040*	-0.010	0.018	0.017	0.009	0.032+	0.042*	0.054***	-0.004
	(0.019)	(0.017)	(0.017)	(0.014)	(0.017)	(0.016)	(0.019)	(0.019)	(0.014)	(0.016)
Education [b]										
Secondary	0.075***	0.028*	0.042***	0.035***	0.044***	0.059***	0.021	-0.004	0.003	0.008
	(0.013)	(0.011)	(0.012)	(0.010)	(0.011)	(0.011)	(0.013)	(0.013)	(0.010)	(0.011)
Post-secondary	0.105***	0.032*	0.097***	0.048***	0.062***	0.091***	0.053**	0.012	-0.009	-0.011
	(0.018)	(0.016)	(0.016)	(0.013)	(0.015)	(0.014)	(0.018)	(0.017)	(0.013)	(0.014)
Age	0.010	0.016**	0.026***	0.015**	0.007	0.008	0.014*	0.020***	0.014**	0.007
	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.005)
Age squared/100	-0.010	-0.019*	-0.033***	-0.016*	-0.005	-0.008	-0.015	-0.024**	-0.015*	-0.005
	(0.009)	(0.008)	(0.008)	(0.007)	(0.008)	(0.007)	(0.009)	(0.009)	(0.007)	(0.007)
Ever worked [c]	0.079***	0.094***	0.010	0.036***	0.023*	0.045***	0.120***	0.088***	0.048***	0.033**
	(0.013)	(0.011)	(0.012)	(0.010)	(0.011)	(0.011)	(0.013)	(0.013)	(0.010)	(0.011)
Age at first marriage	0.001	-0.001	-0.003+	-0.001	0.001	0.000	-0.003	-0.003*	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Husband related by blood [d]	-0.025*	-0.022*	-0.019+	-0.020*	-0.009	-0.013	-0.038**	-0.018	0.008	-0.015
	(0.012)	(0.011)	(0.011)	(0.009)	(0.011)	(0.010)	(0.012)	(0.012)	(0.010)	(0.010)
Region [e]										
Upper Egypt	-0.183***	-0.201***	-0.101***	-0.108***	-0.103***	-0.098***	-0.128***	-0.102***	-0.002	-0.012
	(0.012)	(0.011)	(0.011)	(0.009)	(0.011)	(0.010)	(0.012)	(0.011)	(0.009)	(0.009)
Urban [f]	0.068***	0.044***	0.062***	0.048***	0.048***	0.046***	0.068***	0.010	-0.011	-0.015
	(0.012)	(0.010)	(0.011)	(0.009)	(0.010)	(0.010)	(0.012)	(0.012)	(0.009)	(0.009)
Observations	7,622	7,622	7,622	7,622	7,622	7,622	7,622	7,622	7,622	7,622
Cragg-Uhler (Nagelkerke)-R^2	0.101	0.134	0.058	0.090	0.055	0.072	0.078	0.044	0.027	0.012

Notes: Reference categories: [a] No children, [b] No more than basic education, [c] Never worked, [d] Husband is not related by blood, [e] Lower Egypt, [f] Rural; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1, standard errors in parentheses.

Table A4: Jordan: Logistic regression models, average marginal effects. Integrated Labor Market Panel Surveys (Egypt 2012, Jordan 2016, Tunisia 2014).

	(1) Decision large purchases	(2) Decision daily need purchases	(3) Decision visits	(4) Decision food cooked each day	(5) Decision medical treatment	(6) Decision buying clothes	(7) Access to household money	(8) Mobility to the market	(9) Mobility to the doctor	(10) Mobility to relatives and friends
Parenthood [a]	-0.029	-0.053*	-0.021	0.020	-0.003	-0.002	0.088***	0.008	0.015	0.011
	(0.019)	(0.022)	(0.015)	(0.015)	(0.014)	(0.012)	(0.020)	(0.015)	(0.014)	(0.015)
Education [b]										
Secondary	0.091***	0.047*	0.067***	0.050***	0.053***	0.043***	0.047*	0.044**	0.028*	0.011
	(0.017)	(0.020)	(0.013)	(0.012)	(0.012)	(0.010)	(0.020)	(0.014)	(0.014)	(0.014)
Post-secondary	0.074***	0.081***	0.075***	0.064***	0.071***	0.056***	0.061***	0.019+	0.008	0.001
	(0.015)	(0.017)	(0.012)	(0.010)	(0.010)	(0.009)	(0.017)	(0.011)	(0.011)	(0.012)
Age	0.015*	0.016*	0.012*	0.008+	0.009*	0.002	0.009	0.017**	0.017**	0.016**
	(0.006)	(0.007)	(0.005)	(0.004)	(0.004)	(0.004)	(0.007)	(0.005)	(0.005)	(0.005)
Age squared/100	-0.017+	-0.018+	-0.017*	-0.010	-0.012*	-0.004	-0.008	-0.019**	-0.019**	-0.017*
	(0.009)	(0.011)	(0.007)	(0.007)	(0.006)	(0.006)	(0.010)	(0.007)	(0.007)	(0.007)
Ever worked [c]	0.088***	0.084***	0.041**	0.026*	0.024+	0.037***	0.199***	0.026+	0.038**	0.031*
	(0.016)	(0.020)	(0.014)	(0.013)	(0.013)	(0.010)	(0.022)	(0.014)	(0.015)	(0.015)
Age at first marriage	-0.001	-0.001	-0.001	-0.001	-0.001	0.000	-0.001	-0.001	-0.002	-0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Husband related by blood [d]	-0.013	-0.027+	-0.012	0.010	0.009	0.008	0.045**	-0.006	-0.007	-0.015
	(0.014)	(0.015)	(0.011)	(0.009)	(0.009)	(0.008)	(0.015)	(0.010)	(0.010)	(0.010)
Region [e]										
North	-0.019	-0.076***	-0.019+	0.027**	0.011	0.032***	0.057***	-0.033**	-0.045***	-0.022*
	(0.013)	(0.015)	(0.011)	(0.009)	(0.010)	(0.008)	(0.014)	(0.010)	(0.010)	(0.010)
South	-0.073***	-0.031	0.028*	-0.028+	0.029*	0.037***	0.057**	-0.079***	-0.073***	-0.071***
	(0.019)	(0.020)	(0.013)	(0.015)	(0.012)	(0.011)	(0.019)	(0.011)	(0.011)	(0.011)
Urban [f]	0.026+	0.020	0.036**	0.016	0.029**	0.013	0.010	0.010	0.018+	-0.004
	(0.014)	(0.016)	(0.012)	(0.010)	(0.010)	(0.009)	(0.015)	(0.010)	(0.010)	(0.011)
Observations	4,550	4,550	4,550	4,550	4,550	4,550	4,550	4,550	4,550	4,550
Cragg-Uhler (Nagelkerke)-R^2	0.046	0.038	0.049	0.045	0.049	0.055	0.083	0.059	0.057	0.046

Notes: Reference categories: [a] No children, [b] No more than basic education, [c] Never worked, [d] Husband is not related by blood, [e] Middle, [f] Rural; *** p<0.001, ** p<0.01, * p<0.05, + p<0.1, standard errors in parentheses.

Table A5: Tunisia: Logistic regression models, average marginal effects. Integrated Labor Market Panel Surveys (Egypt 2012, Jordan 2016, Tunisia 2014).

	(1) Decision large purchases	(2) Decision daily need purchases	(3) Decision visits	(4) Decision food cooked each day	(5) Decision medical treatment	(6) Decision buying clothes	(7) Access to household money	(8) Mobility to the market	(9) Mobility to the doctor	(10) Mobility to relatives and friends
Parenthood [a]	0.047	0.088^{+}	0.021	0.080*	0.016	0.023	0.110*	-0.019	0.019	0.014
	(0.042)	(0.047)	(0.030)	(0.034)	(0.026)	(0.029)	(0.045)	(0.042)	(0.040)	(0.041)
Education [b]										
Secondary	0.175***	0.040	0.009	-0.011	0.021	0.050*	0.056	0.028	0.041	-0.039
	(0.035)	(0.049)	(0.031)	(0.031)	(0.026)	(0.023)	(0.049)	(0.041)	(0.042)	(0.039)
Post-secondary	0.134***	0.047	0.064**	0.050*	0.074***	0.065***	0.013	0.031	0.121*	0.033
	(0.037)	(0.048)	(0.023)	(0.023)	(0.015)	(0.019)	(0.049)	(0.044)	(0.047)	(0.045)
Age	0.010	0.033*	0.013	0.005	0.005	0.003	0.019	0.032*	0.011	-0.010
	(0.014)	(0.016)	(0.010)	(0.009)	(0.008)	(0.009)	(0.016)	(0.015)	(0.015)	(0.014)
Age squared/100	-0.014	-0.047*	-0.018	-0.006	-0.007	-0.005	-0.026	-0.041*	-0.009	0.019
	(0.019)	(0.021)	(0.013)	(0.013)	(0.012)	(0.012)	(0.022)	(0.020)	(0.020)	(0.019)
Ever worked [c]	0.090***	0.042	0.004	0.027^{+}	0.015	0.024	0.141***	0.018	0.017	0.051*
	(0.023)	(0.026)	(0.017)	(0.016)	(0.015)	(0.015)	(0.027)	(0.024)	(0.024)	(0.024)
Age at first marriage	-0.000	-0.001	-0.001	-0.001	-0.001	-0.000	0.001	-0.001	-0.003	-0.001
	(0.002)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
Husband related by blood [d]	-0.022	-0.032	-0.032	-0.049*	-0.036*	-0.033^{+}	-0.028	-0.001	-0.019	-0.021
	(0.027)	(0.030)	(0.021)	(0.021)	(0.018)	(0.018)	(0.031)	(0.028)	(0.027)	(0.027)
Region [e]										
North West	0.030	0.014	0.113***	0.125***	0.067***	0.006	-0.006	-0.254***	-0.140***	-0.074*
	(0.033)	(0.039)	(0.023)	(0.020)	(0.019)	(0.020)	(0.039)	(0.038)	(0.038)	(0.037)
Center East	-0.144***	-0.092*	-0.046	-0.082**	-0.096***	-0.141***	-0.108**	-0.265***	-0.175***	-0.127***
	(0.035)	(0.037)	(0.031)	(0.031)	(0.029)	(0.028)	(0.038)	(0.035)	(0.035)	(0.032)
Center West	0.071*	0.036	0.124***	0.111***	0.079***	0.035*	-0.123**	-0.330***	-0.248***	-0.140***
	(0.030)	(0.037)	(0.021)	(0.021)	(0.017)	(0.017)	(0.039)	(0.034)	(0.034)	(0.034)
South East	-0.374***	-0.103*	0.005	0.042	0.020	0.024	-0.345***	-0.288***	-0.222***	0.116*
	(0.044)	(0.047)	(0.037)	(0.031)	(0.028)	(0.022)	(0.042)	(0.039)	(0.039)	(0.047)
South West	-0.007	-0.019	0.090*	0.061	-	-	-0.153*	-	-0.362***	-0.237***
	(0.063)	(0.070)	(0.040)	(0.042)	-	-	(0.070)	-	(0.034)	(0.043)
Urban [f]	0.127***	0.175***	0.062***	0.048**	0.044**	0.049**	0.149***	0.113***	0.040	0.027
	(0.023)	(0.027)	(0.017)	(0.017)	(0.015)	(0.015)	(0.028)	(0.025)	(0.024)	(0.025)
Observations	1,480	1,480	1,480	1,480	1,426	1,426	1,480	1,426	1,480	1,480
Cragg-Uhler (Nagelkerke)-R^2	0.170	0.072	0.120	0.171	0.166	0.156	0.128	0.182	0.116	0.076

Notes: Reference categories: [a] No children, [b] No more than basic education, [c] Never worked, [d] Husband is not related by blood, [e] North, [f] Rural; *** p<0.001, ** p<0.01, * p<0.05, $^{+}$ p<0.1, standard errors in parentheses.

Study 2

Women's agency and childbirth: The effect of transition to motherhood and subsequent births on women's agency in Egypt

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Introduction

Women's agency refers to their ability to "define their own life-choices and to pursue their own goals, even in the face of opposition from others" (Kabeer 1999: 438). While women's agency is important in itself, several scholars also stress its positive impact on societal development and children's health (Doan and Bisharat 1990; Kishor 2000; Klugman et al. 2014; Shroff et al. 2009, 2011). Women's agency is context specific (Yount et al. 2016) and is especially limited in societies with strong patriarchal values. Countries in the Middle East and North Africa (MENA) are characterized as "neopatriarchal societies," in which the husband is traditionally expected to financially provide for and protect his wife and children, while the wife is expected to obey her husband and is responsible for household and childrearing tasks (Moghadam 2004). In this context, relatively low levels of women's decision-making, financial autonomy, and freedom of movement can be found (Charmes et al. 2015; Friedrich et al. 2021).

Restricting women to roles as mothers and wives leads to high social pressure on women to marry and bear children (Tadros 2010). While fertility has declined substantially since the 1980s in the MENA region (Eltigani 2009; Engelhardt et al. 2018), motherhood remains nearly universal, and marriage is "a culturally defined precondition" for the transition to parenthood (Gebel and Heyne 2014: 189). In Egypt, the most populous MENA country, the total fertility rate declined from 4.5 in 1988 to 3.0 in 2008 before increasing to 3.5 in 2014 (Ambrosetti et al. 2021) and then falling again to 3.1 in 2018 (Krafft et al. 2022). From 1988 to 2014, the average ideal number of children in Egypt remained relatively stable at around three (Ambrosetti et al. 2019). Percentages of childlessness are very low: Between 1994 and 2000, only 2.8% of Egypt's married women aged 40–44 had no children (Rutstein and Shah 2004).

Since childbearing is an integral part of women's life course, and since the literature indicates that bearing children has a positive impact on women's value and social position in patriarchal contexts (Kabeer 1999; Yount et al. 2016), the question arises whether birth transitions might influence women's agency. However, research on the effect of childbirth on women's agency is rare (MENA: Friedrich et al. 2021; Samari 2017a; India: Reed 2021). Samari (2017a) and Friedrich et al. (2021) have shown positive associations between motherhood and women's agency in countries in the MENA region. Both studies provide valuable first insights into the relationship between childbirth and agency in this region; however, their methods rest on the strong assumption of exogeneity of the time-constant unobserved heterogeneity, which is likely to be violated.

This study extends the previous literature in three ways: First, the study is unique by using a fixed effects panel research design in the MENA context, aiming to determine whether the transition to motherhood and subsequent birth transitions change married women's agency. It uses large-scale panel data from three waves of the Egypt Labor Market Panel Survey (ELMPS; Economic Research Forum and Central Agency for Public Mobilization and Statistics 2019). Egypt is a typical example of a MENA country with low levels of childlessness and a neopatriarchal gender regime (Moghadam 2020). Second, this paper shows how the association between childbirth and agency varies by women's educational attainment and rural or urban residence. Until now, little is known about the circumstances under which childbirth might increase women's agency. Third, this study provides insights into the variability or stability of women's agency over the life course and draws attention to possible reverse causality in the relationship between women's agency and fertility behavior.

Women's agency in Egypt

Women's agency is a multidimensional and context-specific construct (Kabeer 1999; Yount et al. 2016). According to Kabeer's (1999) definition, women's agency is a component of women's empowerment, a process that takes place over time which includes (1) resources, (2) agency, and (3) achievements. Women acquire resources through this process, which enhances their agency and, in turn, their achievements (Kabeer 1999). Decision-making, freedom of movement, financial autonomy, and gender norms are common measures and direct indicators of agency (Richardson 2018; Thorpe et al. 2016) that have been empirically validated in the Egyptian context (Cheong et al. 2017; Samari 2019b; Yount et al. 2016). While the first three capture instrumental agency, gender norms capture intrinsic agency (Kabeer 1999). This study focuses on women's instrumental agency, which is relatively limited in the Egyptian context. For example, according to a 2005 study in rural Minya, Egypt, less than 15% of ever-married women aged 22 to 65 reported making independent decisions about their healthcare or visiting relatives (Yount et al. 2014). Among married Egyptian women, the spouse is more likely to have the final say in household decisions in rural areas than in urban areas (Keo et al. 2022). Notably, the share of Egyptians living in rural areas is very high (60% in 2018; Krafft et al. 2022).

Egyptian women's agency should be considered against the backdrop of persistent patriarchal values. MENA countries are characterized as "neopatriarchal societies" in which

modernization processes have eroded classic patriarchy and the extended household unit (Moghadam 2004). However, women's roles are still mainly restricted to household and childrearing tasks, while the husband is expected to protect and financially provide for his wife and children and is considered the head of the household (Hoodfar 1997). Defining women as a protected group—and an existing perception that family honor depends on women's conformity to norms—limits women's freedom of movement and participation in the public sphere (Miles 2002; Yount et al. 2016). The "patriarchal contract" (Moghadam 2004) is also institutionalized in Egypt's personal status law, which regulates family matters and domestic relations. As in several other MENA countries, an Egyptian wife is legally required to obey her husband, which can restrict women's freedom of movement and labor market participation (OECD 2017).

The traditional gender division of labor is reflected in the female labor force participation rate in Egypt, which is among the lowest in the world (15% in 2020; International Labour Organization 2022). This situation persists despite Egyptian women's high educational attainment and nearly closed education gender gap (Krafft et al. 2022; World Economic Forum 2021), which is also known as the "MENA paradox" (Assaad et al. 2020). Education and employment can serve as resources for women's agency: Women with more education realize higher levels of agency than low-educated women (Friedrich et al. 2021; Samari and Pebley 2018; Yount 2005). Salem et al. (2018) shows that women in rural Minya, Egypt who engage in subsistence or market work have greater freedom of movement than women who do not. Employed Egyptian women are also more likely to have access to household money than women who do not work (Hendy 2015).

Childbirth and women's agency

A large body of research shows an inverse relationship between women's instrumental agency and realized or ideal family size (for a review, see: Upadhyay et al. 2014; more recent studies include, e.g., Ambrosetti et al. 2021; Atake and Gnakou Ali 2019; Doepke and Tertilt 2018; Haque et al. 2021), meaning that women with more agency have or prefer to have fewer children than women with less agency. Most studies rely on cross-sectional data and focus on South Asian or sub-Saharan African countries. Only three studies focus on the MENA region (Egypt); they show a negative association between women's involvement in decisions about visits and their ideal number of children (Ambrosetti et al. 2021), but, surprisingly, a positive association

between higher instrumental agency (decision-making, financial autonomy, freedom of movement) and their actual number of children (Samari 2017b, 2019a).

One partial explanation for the positive associations between realized fertility and instrumental agency could be reverse causality, meaning that motherhood or a higher number of children might positively affect women's agency in the Egyptian context. However, research on the effect of childbirth on women's agency is rare (MENA: Friedrich et al. 2021; Samari 2017a; India: Reed 2021), and results are mixed. A study in India using data from two waves of the Indian Human Development Study (IHDS) and estimating fixed effects regression models shows that women's freedom of movement and access to enabling resources, but not decision-making power, are higher after the transition to motherhood (Reed 2021). This is consistent with the findings for Egypt by Friedrich et al. (2021), who use a cross-sectional design. However, another study in Egypt finds that first birth and subsequent births are positively associated with involvement in decision-making and freedom of movement but not with financial autonomy (Samari 2017a).

Both previous studies in the MENA region (Friedrich et al. 2021; Samari 2017a) rest on the strong assumption of exogeneity of the time-constant unobserved heterogeneity. Although Samari (2017a) uses longitudinal data from the ELMPS 2006 and 2012, the study's methodological design does not take full advantage of the panel data. The analysis accounts for causal ordering by regressing the number of births in 2006 on agency in 2012 but cannot protect against bias arising from unobserved time-invariant heterogeneity. Therefore, the present study extends the previous literature, particularly the findings of Samari (2017a) and Friedrich et al. (2021), by using a fixed effects panel research design in the MENA context. The study further examines how the association between childbirth and agency varies by women's educational attainment and rural or urban residence. Little is known about the factors influencing the relationship between childbirth and agency and the circumstances under which childbirth might increase women's agency. Apart from the study by Friedrich et al. (2021), which finds a negative relationship between motherhood and agency among highly educated women in Egypt, I am not aware of any study that examines moderators of the relationship between childbirth and agency.

Theory and hypotheses

A popular explanation for findings from longitudinal research in Western contexts that show a shift towards a more traditional gender division of labor after the transition to parenthood (e.g., Baxter et al. 2008; Killewald and García-Manglano 2016; Kühhirt 2012; Musick et al. 2020) is that childbirth changes relative bargaining power, which strongly depends on each partner's resources, such as paid employment. According to classical resource theory, the spouse with the most valued resources has more power over the other within a marriage (Blood and Wolfe 1965). In family research, bargaining models have been widely used to examine the distribution of resources and power in couples (Abraham et al. 2010; Bittman et al. 2003; Bünning 2020; Cooke 2006; Lundberg and Pollak 1996).

Within this theoretical framework, women's instrumental agency can be seen to be affected by the relative bargaining power of spouses—that is, agency is not fixed but can be negotiated. If a woman's relative bargaining power within her marriage increases, her involvement in decision-making, access to household money, and freedom of movement will likely increase. In the following, I present arguments as to why, in the patriarchal Egyptian context, (1) motherhood and (2) subsequent births can be considered resources that can increase married women's bargaining power and, in turn, their instrumental agency.

(1) In Egypt, motherhood is essential for a woman's social position within her family (Kandiyoti 1988; Yount et al. 2016). Therefore, assuming that women's value and social position improve with the transition to motherhood, having children can be seen as a resource for women. Additionally, the traditional gender division of responsibilities associated with the mother role allows women to argue that they need more agency to adequately perform childrearing tasks and the additional household tasks required after the transition to motherhood. For example, a woman could say that she needs access to household money, freedom of movement to go to the market, and decision-making power regarding household purchases and meals to adequately take care of daily household needs and cooking. A husband may allow his wife more freedom than before the transition to parenthood to ensure a well-functioning everyday family life and good care for the children. Having children comes with many responsibilities for both spouses; allowing the wife more agency concerning her household responsibilities can disburden the husband. Also, Heer (1963) argues that a woman's ability to fulfill her role as a mother to her children can be seen as a significant resource for women. In the Egyptian context, the results of a qualitative study show that some women "hesitated to challenge fixed role stereotypes […] because this would mean giving up the only

form of power they could have" (Henry 2011: 258). Regarding freedom of movement, a woman might have more mobility as a mother because taking her children to public places indicates that she is married.

The first hypothesis, H1a, therefore, refers to the transition from being childless to *having at least one* living child (motherhood):

H1a: The transition to motherhood increases women's instrumental agency.

(2) Subsequent births could also affect women's agency. A higher number of children increases the number of household and child-rearing responsibilities and thus further expands women's opportunities to ask for more agency. In addition, having more children could improve women's social position as well. However, I do not assume a linear association between number of children and women's agency. For example, having a second or a third birth might improve women's social position, while having a fourth birth might not, as the average ideal number of children in Egypt remained stable at around three during the 1988–2014 period (Ambrosetti et al. 2019). The following hypothesis, H1b, refers to the transition from having one child to *having two or more children*, which I call the transition to a higher-order birth:

H1b: The transition to a higher-order birth increases women's instrumental agency.

Notably, these arguments and hypotheses are valid only in highly patriarchal contexts with a traditional gender division of responsibilities in which having children is tied to a woman's value or social position. Therefore, births should have a higher positive impact on agency for women living in a more patriarchal context and women who are more limited to the mother role.

Under classic patriarchy, women have restricted access to education and marry at a young age (Kandiyoti 1988; Moghadam 2004). Today, in the neopatriarchal Egyptian society (Moghadam 2020), women's rising educational attainment gives them the opportunity to take on alternative roles beyond wife and mother, especially in the labor market, but presumably in other public spheres as well (e.g., social contacts, leisure). Even though female labor market participation is low, women in Egypt with a higher level of education are more likely to be employed than lower-educated women (Gebel and Heyne 2014; Selwaness and Krafft 2021). Therefore, I expect that women with only compulsory education are generally more limited to the mother role and a traditional division of labor than women with a higher level of education. This could change the effect of birth transitions on women's agency: If the transitions to motherhood and a higher-order birth reduce higher-educated women's access to alternative

roles in the public sphere because of their increased time spent on domestic labor, the impact of birth transitions on agency could be weaker (or even negative). Therefore, I hypothesize the following regarding the positive shift in women's agency in relation to education:

H2a: The positive effect of the transition to motherhood on women's agency is stronger for low-educated women than for women with at least an intermediate education.

H2b: The positive effect of the transition to a higher-order birth on women's agency is stronger for low-educated women than for women with at least an intermediate education.

An essential indicator of the patriarchal context in which a woman lives is her residence. Rural areas are characterized by stricter patriarchal familial and societal structures than urban areas (Moghadam 2004). Thus, childbearing should be more likely to increase women's agency in a rural context than in an urban context, leading to the following two hypotheses:

H3a: The positive effect of the transition to motherhood on women's agency is stronger for women living in rural areas than for women living in urban areas.

H3b: The positive effect of the transition to a higher-order birth on women's agency is stronger for women living in rural areas than for women living in urban areas.

Method

Data and sample

I used data from the last three waves of the ELMPS (2006, 2012, and 2018; Economic Research Forum and Central Agency for Public Mobilization and Statistics 2019). This national large-scale representative household panel survey collects labor market, socio-economic, and demographic information from individuals over time (Krafft et al. 2019). As information on women's births and agency has only been available since the 2006 wave, data from the first wave, carried out in 1998, could not be used for the analysis.

The ELMPS includes information on three dimensions of women's instrumental agency: (1) involvement in decision-making, (2) financial autonomy, and (3) freedom of movement.

Involvement in decision-making was measured using six items. Women were asked who in the family usually has the final say on several types of decisions: (1) making large household purchases; (2) making household purchases for daily needs; (3) visits to family, friends, or relatives; (4) what food should be cooked each day; (5) getting medical treatment or advice for oneself; and (6) buying clothes for oneself. The response options for all items included "respondent alone," "husband," "respondent and husband jointly," "in-laws," "respondent, husband, and in-laws jointly," and "others." I recoded each item to indicate whether or not the woman is involved in the decision and created a count variable to capture the number of decisions in which the woman is involved (range: 0–6). In this context, "involved" means that the respondent makes the decision alone or with another person. "Not applicable" was coded as missing.

Financial autonomy was a dichotomous variable, coded as 1 if the woman has access to household money and 0 if the woman has no access to household money.

Freedom of movement was measured using three items. Women were asked whether they cannot go alone, need permission to go, only have to inform someone, or can go without permission to several places: (1) the local market, (2) the local health center or doctor, and (3) the home of relatives, friends, or neighbors. I recoded each item into a binary variable, coded as 1 if the woman only has to inform or can go without permission and 0 if the woman cannot go alone or needs permission. I also created a count variable to measure the number of places a woman can go freely (range: 0–3). "Not applicable" was coded as missing.

My explanatory variables of interest are having at least one child and having at least two children. I operationalized having at least one child and having at least two children as dummy variables, coded as 1 if the woman has the respective number of children and 0 otherwise.

The original ELMPS data set from the 2006, 2012, and 2018 waves consists of 79,634 individuals providing 147,557 person-years. A refresher sample of 2,000–3,000 households was added at each wave. I restricted the sample to married women aged 15–49 whose husband is present in the household (16,665 person-years from 9,433 women) because births outside this age range are rare and may be associated with unusual circumstances. Women who reported fewer number of children in a subsequent wave were excluded (547 person-years from 201 women). I dropped an additional 4,534 women who were interviewed in only one wave and 1,139 person-years due to missing values on agency or other variables needed in the analysis. After these restrictions, I eventually excluded women for whom only one observation remained (507 women). The final sample thus comprises 9,938 person-years from 4,152 women. The two

subsamples for the analyses of the transition to motherhood and the transition to a higher-order birth include 1,291 person-years from 554 women and 2,616 person-years from 1,098 women, respectively. The construction of these subsamples and the respective restrictions are explained in the next subsection. Although the restrictions considerably reduced the sample size, they were necessary to obtain unbiased fixed effects estimates.

Analytical strategy

I used fixed effects (FE) regression models to investigate the impact of childbirth on women's agency. Such models have been widely used to estimate causal effects of childbearing on, for example, life satisfaction (Matysiak et al. 2016; Myrskylä and Margolis 2014), gender role attitudes (Baxter et al. 2015), and employment and wages (Budig and England 2001; Hsu 2021). I used Stata 16 for all analyses.

For *involvement in decision-making* and *freedom of movement*, I estimated FE Poisson regression models because the outcome variables are discrete counts (the number of decisions in which the woman is involved and the number of places to which a woman can move freely). Poisson regression assumes that the mean must be equal to the variance—that is, there is no overdispersion. This assumption is violated in the case of the outcome variable involvement in decision-making. One solution would be to use FE negative binomial regression, but it has been shown that this is not a true FE method (Allison and Waterman 2002). Therefore, I decided to use FE Poisson regression models with adjusted standard errors, as suggested by Allison and Waterman (2002). The Poisson regression coefficients can be interpreted as changes in the logs of the expected counts, and thus exp(b) can be interpreted in terms of percent changes. As a robustness check, I estimated FE linear models for women's involvement in decision-making and freedom of movement, and the main results were similar.

For *access to household money*, I estimated FE linear probability models. Several scholars recommend using the linear probability model for binary dependent variables (e.g., Angrist and Pischke 2010; Mood 2010; Breen et al. 2018) because it offers a clear interpretation of the coefficients as a set of average discrete changes in the probability of the outcomes (Wooldridge 2010). This is much easier to interpret than odds ratios or logit coefficients.

Due to the possibility of effect heterogeneity, assuming a linear association between number of children and women's agency is problematic. For example, the effect on women's agency of having a first birth and having a second birth are likely to differ since, unlike having

a second birth, having a first birth comes with a completely new role: motherhood. Therefore, the effect of each childbirth should ideally be estimated separately. However, due to the significant long time gap between the waves of the ELMPS (six years), analyzing each birth transition separately is not reasonable because it would involve studying a highly selective group: women who have a first child late after getting married and women who have long birth intervals (at least six years). This would limit the generalizability of the results. In addition, the sample sizes would be small since the majority of Egyptian women experience the transition to first birth soon after marriage (Eltigani 2000; Gebel and Heyne 2014) and have birth intervals shorter than six years (Ministry of Health and Population [Egypt] et al. 2015). Based on these circumstances, models were estimated separately, not for each birth transition but for the transition to motherhood (having at least one child, H1a) and the transition to a higher-order birth (having at least two children, H1b).

I constructed two subsamples including only women who were at risk of experiencing the respective birth transition (transition to motherhood or a higher-order birth) during the observation period. Eventually, women with only one person-year remaining were excluded to obtain meaningful FE estimates. According to this procedure, the two subsamples include and exclude the following person-years:

(1) Subsample 1 for estimating the relationship between the transition to motherhood and women's agency includes all person-years where women were childless and all person-years where women had at least one child. Women who already had at least one child at the first observation were excluded.

(2) Subsample 2 for estimating the relationship between the transition to a higher-order birth and women's agency includes only person-years where women were already mothers. It contains all person-years where women had one child and all person-years where women had at least two children. Women who already had at least two children at the first observation and person-years where women were childless were excluded.

FE regression models do not rest on the strong assumption of exogeneity of the time-constant unobserved heterogeneity since they use only within-individual variation in the dependent and independent variables. Therefore, they rest on weaker assumptions for identifying causal effects than pooled OLS or random-effects regression models (Brüderl and Ludwig 2015). However, time-varying heterogeneity can still bias the FE estimates. In the models, I included women's *employment* and *household wealth* as time-varying covariates, which I expect to affect both women's agency and childbearing. I used a dichotomous variable

for employment, coded as 1 if the woman was employed in the past three months (market definition, i.e., economic activity for purposes of market exchange) and 0 otherwise. Household wealth was captured by an index provided by the ELMPS based on household assets and durable goods. In addition, the models controlled for *age groups* and *wave* (single-wave dummy variables) to account for maturation effects and possible period effects, respectively. I used five-year age groups to avoid the age–period–cohort identification problem.

As very few women experienced considerable changes in their education status and rural or urban residence during the observation period, both were treated as time-constant variables. They were, therefore, not included as time-varying control variables in the models. In Egypt, most women finish or leave their education before marriage (Gebel and Heyne 2014). I also estimated the models while including educational level and residence as time-varying controls, and the results were similar. Moreover, employment could mediate the effect of births on agency; if so, its inclusion in the models would lead to overcontrol bias (Elwert and Winship 2014). Therefore, as a sensitivity analysis, I estimated the models without the time-varying covariate employment. The main results did not differ and are presented in the Appendix Tables A7–A9.

While time-constant covariates cannot be included in FE models, interactions between time-constant and time-varying variables can be included (Allison 2009). To investigate whether the relationship between childbirth and agency varies by education or rural vs. urban area, I included interaction terms between the birth transition and women's educational level and between the birth transition and women's residence. Women's educational level and residence are dichotomous variables: below intermediate (1) vs. intermediate and above (0) and urban (1) vs. rural (0), respectively. "Below intermediate" corresponds to ISCED levels 0, 1, and 2 (compulsory education), and "intermediate and above" refers to ISCED level 3 or higher.

Results

Descriptive results

Tables 1 and 2 below present descriptive results for the three outcome variables of interest (involvement in decision-making, access to household money, and freedom of movement). Table 3 displays descriptive results for all variables used in the analyses.

Table 1 shows that women's agency changed over the three survey years of the ELMPS (2006, 2012, and 2018). All dimensions of women's agency are highest in the last survey year, 2018. While involvement in decision-making increased continuously from 2006 to 2018, access to household money and freedom of movement are lowest in the second survey year, 2012. These results demonstrate the importance of accounting for maturation or period effects in the model since the changes in women's agency observed over the survey years could be partly a result of these effects. Women's agency is most limited in terms of freedom of movement. In 2006 and 2012, women are, on average, unable to move freely to at least one of the three places listed. In all survey years, women are, on average, involved in more than four (out of six) household decisions, and most women have access to household money.

Table 1: Women's involvement in decision-making (range: 0–6), access to household money (range 0–1), and freedom of movement (range 0–3) by survey year.

	Mean (S.D.)		
	2006	2012	2018
Women's agency			
Involvement in decision-making	4.26 (1.71)	4.35 (1.86)	4.86 (1.66)
Access to household money	0.63 (0.48)	0.56 (0.50)	0.76 (0.43)
Freedom of movement	0.92 (0.96)	0.64 (0.93)	1.24 (1.30)
Number of persons	2,200	4,071	3,667

Notes: Based on all 9,938 person-years from 4,152 married women aged 15–49 whose husband is present in the household and who were observed in at least two waves.

Table 2 shows the level of women's agency for the person-years after and before the transition to motherhood and after and before the transition to a higher-order birth for the respective analytic subsample, but only for women who experienced the respective transition during the observation period. In subsample 1, 79% (439 of 554 women) experienced the transition to motherhood; in subsample 2, 91% (1002 of 1,098 women) experienced the transition to a higher-order birth. The results show that women's agency changed across both transitions. All dimensions of women's agency are higher after the transitions than before, and all differences between agency levels before and after the transition are statistically significant ($p < 0.001$; two sample t-test). However, since these shifts in women's agency levels can be due to changes in other observable or unobservable characteristics of individuals occurring together with these transitions, a causal relationship cannot be drawn from these descriptive

results. The analyses in the next section account for important observed time-variant characteristics and all observed and unobserved time-constant characteristics.

Table 2: Women's agency after and before the transition to motherhood (person-years subsample 1) and after and before the transition to a higher-order birth (person-years subsample 2) for women who experienced the respective transition.

	Mean					
	Transition to motherhood			Transition to higher-order birth		
Women's agency	After 1st birth	Before 1st birth	Diff.	After 2nd birth	Before 2nd birth	Diff.
Involvement in decision-making	4.65	4.00	0.66	4.70	4.17	0.54
Access to household money	0.66	0.52	0.14	0.71	0.57	0.14
Freedom of movement	0.96	0.56	0.40	1.07	0.75	0.32
Number of persons	439	439		1,002	1,002	
Person-years	595	446		1,399	1,010	

Notes: All differences are statistically significant ($p < 0.001$; two sample t-test).

Table 3 presents the descriptive results for all variables used in the analyses for the overall sample and the two subsamples (distributions of the sample person-years). On average, women in subsample 1 (transition to motherhood) spent 52% of the observation time childless and 48% of the observation time as mothers. In subsample 2 (transition to a higher order-birth), women spent, on average, 46% of the observation time with one child and 54% of the observation time with at least two children. On average, most women have at least an intermediate education level (more than 60% of person-years in the two subsamples) and live in a rural area (59% and 55% of person-years in subsamples 1 and 2, respectively). In all samples, women spent, on average, less than 20% of the observation time employed.

Table 3: Descriptive statistics for sample person-years.

	Subsample 1: Transition to motherhood	Subsample 2: Transition to higher-order birth	All person-years
	Mean (S.D.) or %	Mean (S.D.) or %	Mean (S.D.) or %
Women's agency			
Involvement in decision-making	4.38 (1.89)	4.48 (1.77)	4.52 (1.78)
Access to household money	0.60 (0.49)	0.65 (0.48)	0.65 (0.48)
Freedom of movement	0.79 (1.08)	0.93 (1.11)	0.93 (1.12)
Number of children			
No child	52.44%		6.81%
One child	5.81%	45.99%	12.65%
Two children	23.24%	22.44%	27.03%
Three children	13.94%	24.27	29.90%
Four or more children	4.57%	7.3%	23.65%
Control variables			
Age	28.98 (6.57)	29.36 (5.91)	32.63 (6.97)
Employed	0.17 (0.38)	0.16 (0.37)	0.19 (0.40)
Household wealth	-0.02 (0.82)	-0.04 (0.81)	-0.07 (0.85)
Education			
Below intermediate	38.42%	36.24%	44.36%
Intermediate and above	61.58%	63.76%	55.64%
Residence			
Rural	58.87%	54.93%	58.34%
Urban	41.13%	45.07%	41.66%
Number of persons	554	1,098	4,152
Person-years	1,291	2,616	9,938
Mean person-years per person	2.43	2.48	2.49

Relationship between childbirth and agency

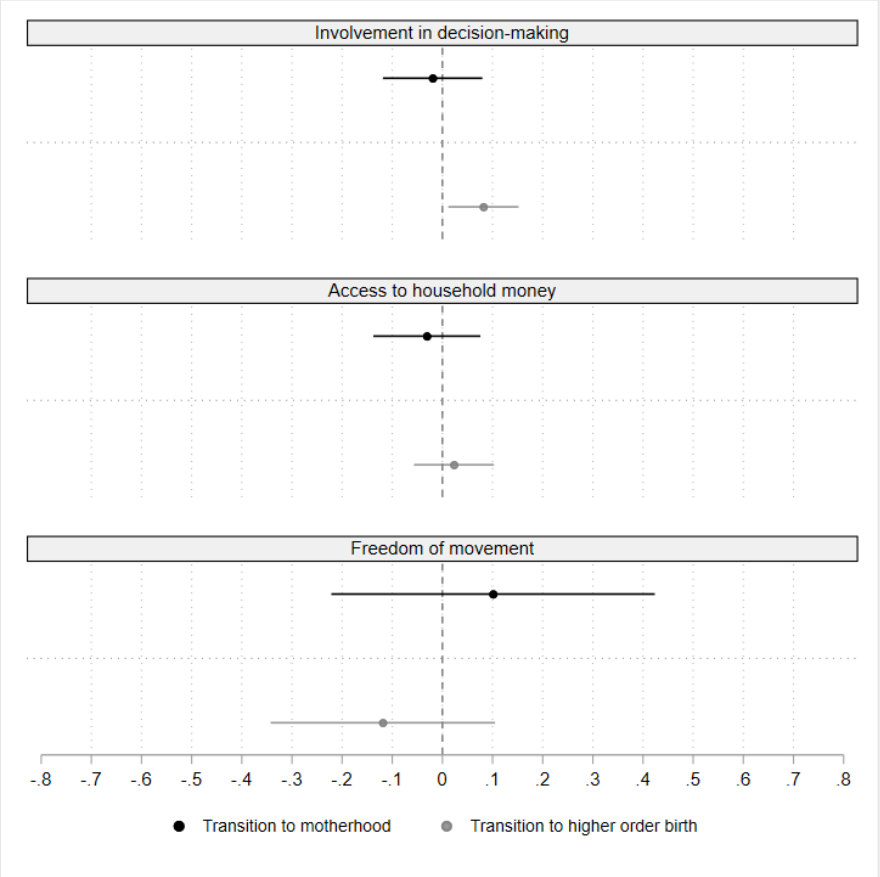
Figure 1 presents the coefficient estimates of the FE linear probability model for access to household money and the FE Poisson regression models for involvement in decision-making and freedom of movement.

Transition to motherhood. The results showed a statistically non-significant and non-substantial negative association between motherhood and women's involvement in decision-making and between motherhood and access to household money. There is a substantial but not statistically significant positive association between motherhood and freedom of movement. The results, therefore, do not support hypothesis H1a ("The transition to motherhood increases women's instrumental agency").

Transition to a higher order-birth. The number of decisions in which women are involved is 8% higher after the birth of (an) additional child(ren). This association is statistically significant ($p < 0.05$). Women are also more likely to have access to household money after the transition to a higher-order birth, but the association is small and not statistically significant. Women's freedom of movement is 11% lower after this birth transition, but the association is also not statistically significant. Hence, the results only confirm hypothesis H1b ("The

transition to a higher-order birth increases women's instrumental agency") with respect to women's decision-making power.

Figure 1: Fixed effects Poisson regression coefficients of transition to motherhood and transition to a higher-order birth on women's involvement in decision-making and freedom of movement, and fixed effects linear regression coefficients of transition to motherhood and transition to a higher-order birth on women's access to household money.



Notes: All models controlled for employment, household wealth, age groups, and wave. Full models are presented in Table A1.

Table A1 also presents results of pooled OLS and pooled Poisson models without the sample restrictions that were necessary for the FE models (n = 15,063 person-years, i.e., person-years in which women were not at risk of experiencing the birth transition and person-years of women who were observed only once are included). Comparing the coefficients of the pooled models with those of the FE models reveals two major differences: (1) Contrary to the FE models, the pooled models show a statistically significant positive association between motherhood and agency (access to household money and freedom of movement), and (2) the pooled models show no positive association between the transition to a higher-order birth and

women's decision-making power. This suggests that women may select themselves into birth transitions based on unobserved factors that also affect their agency. For example, infertility may negatively affect both motherhood and agency (due to its associated stigma). This could explain the positive association in the pooled models. The FE models account for all time-constant heterogeneity and, therefore, also for infertility. Other possible unobservable factors include social background and personality traits. One explanation for the absent association between the transition to a higher-order birth and women's agency in the pooled models could also involve the selection of women with lower agency into a higher-order birth.

Heterogeneity analyses

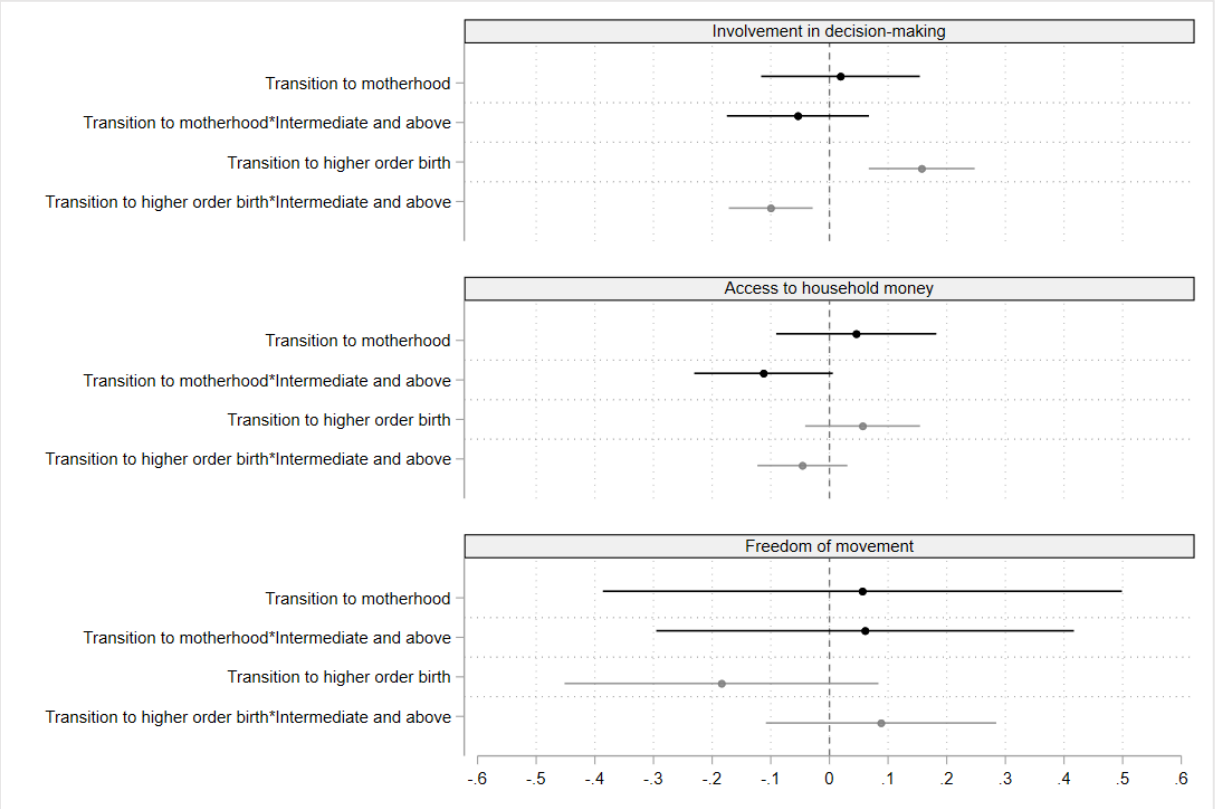
Education

To investigate whether the association between childbirth and agency varies by education, I included an interaction term between the birth transition and women's educational level in all models. Figure 2 presents the coefficient estimates.

Transition to motherhood. There are no statistically significant interaction effects between the transition to motherhood and education; therefore, hypothesis H2a ("The positive effect of the transition to motherhood on women's agency is stronger for low-educated women than for women with at least intermediate education") is not supported.

Transition to a higher-order birth. For women's involvement in decision-making, the results show that the number of decisions in which a low educated woman is involved is 17% higher after the transition to a higher-order birth. For women with at least an intermediate education, this increase is only 6%. The interaction effect is statistically significant ($p < 0.01$). No statistically significant interaction effects are found for women's access to household money and freedom of movement, which means that hypothesis H2b ("The positive effect of the transition to a higher-order birth on women's agency is stronger for low-educated women than for women with at least an intermediate education") is confirmed only concerning women's decision-making power.

Figure 2: Fixed effects Poisson regression coefficients of transition to motherhood and transition to a higher-order birth on women's involvement in decision-making and freedom of movement, and fixed effects linear regression coefficients of transition to motherhood and transition to a higher-order birth on women's access to household money; includes an interaction term between birth transition and educational level.



Notes: All models controlled for employment, household wealth, age groups, and wave. Full models are presented in Table A2.

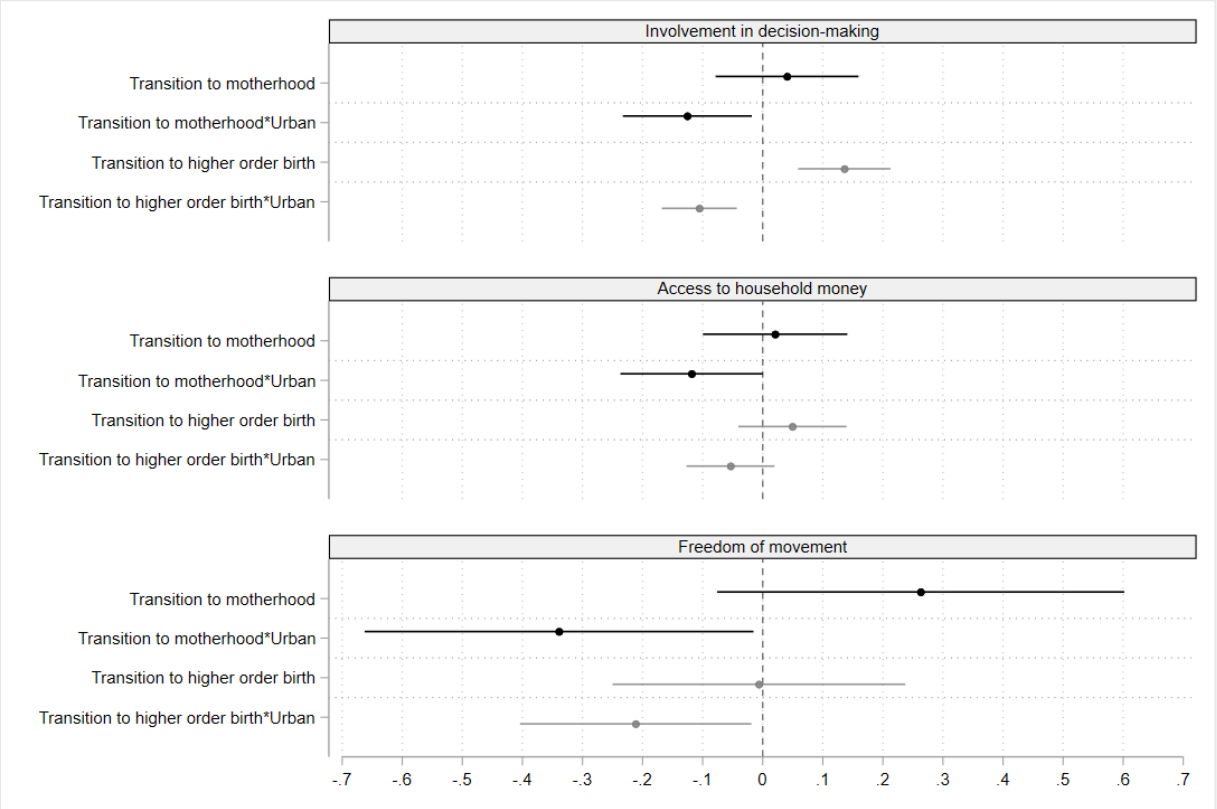
Rural or urban residence

Figure 3 presents the coefficient estimates of the models that include an interaction term between the birth transition and women's residence (urban or rural).

Transition to motherhood. The results show negative associations between agency and the transition to motherhood for women living in urban areas but positive associations for women living in rural areas. However, only the interaction effect for women's involvement in decision-making is statistically significant ($p < 0.05$): After the transition to motherhood, the number of decisions in which women are involved is 4% higher for women living in rural areas but 9% lower for women living in urban areas. Hence, the findings confirm hypothesis H3a ("The positive effect of the transition to motherhood on women's agency is stronger for women living in rural areas than for women living in urban areas") concerning women's decision-making power, by even showing a negative association between motherhood and agency among women living in urban areas.

Transition to a higher-order birth. For involvement in decision-making and freedom of movement, the results show statistically significant interaction effects ($p < 0.01$ and $p < 0.05$, respectively): After the transition to a higher-order birth, decision-making power is 14% higher for women living in rural areas but only 3% higher for women living in urban areas. For women's freedom of movement, the results show a negative association for women living in urban areas (19%) but not for women living in rural areas. These results, therefore, support hypothesis H3b ("The positive effect of the transition to a higher-order birth on women's agency is stronger for women living in rural areas than for women living in urban areas"). However, no statistically significant interaction effect is found for access to household money.

Figure 3: Fixed effects Poisson regression coefficients of transition to motherhood and transition to a higher-order birth on women's involvement in decision-making and freedom of movement, and fixed effects linear regression coefficients of transition to motherhood and transition to a higher-order birth on women's access to household money; includes an interaction term between birth transition and residence (rural or urban).



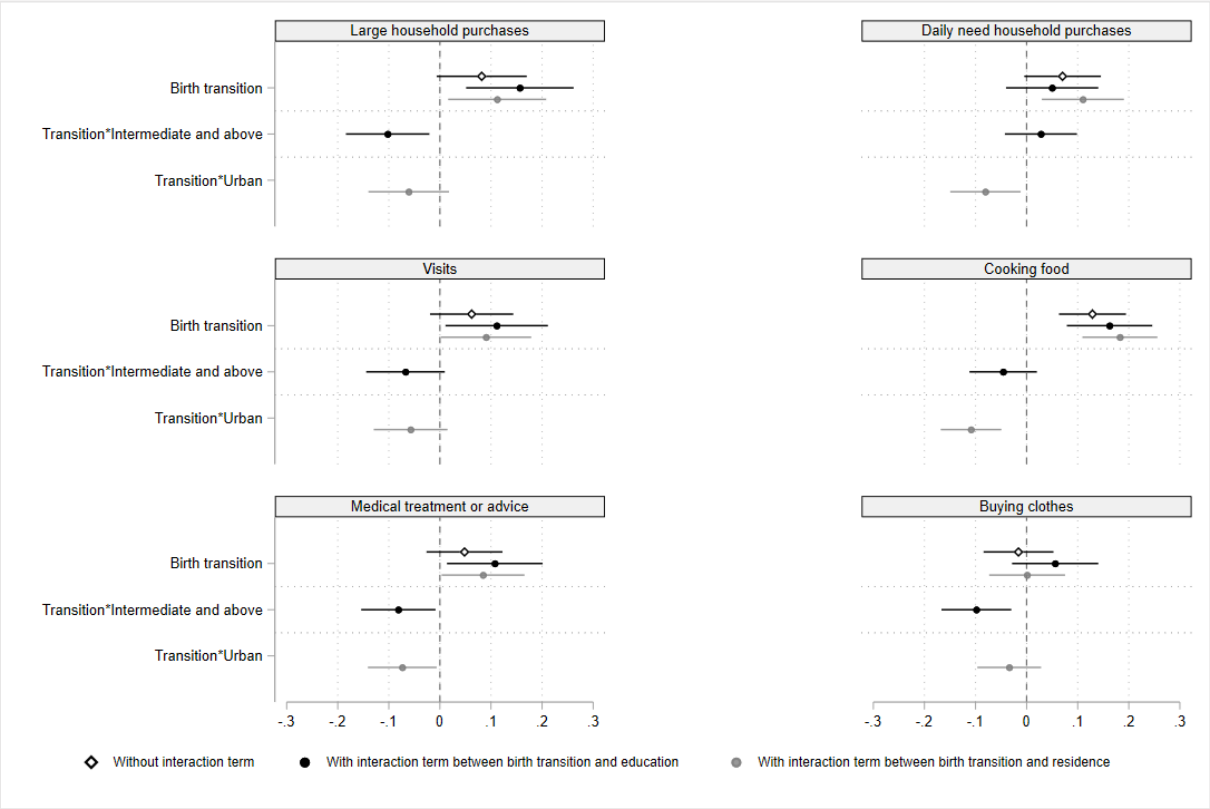
Notes: All models controlled for employment, household wealth, age groups, and wave. Full models are presented in Table A3.

Additional analysis of involvement in decision-making

The results showed a positive association between having at least two children and women's decision-making power. Since the variable "involvement in decision-making" is a count variable based on six different decisions, I conducted an additional analysis to determine whether this positive association is driven entirely by greater involvement in decisions related to household responsibilities (decisions about household purchases or what food should be cooked) or also by other decisions (decisions about visits, medical care, or buying clothes).

Figure 4 shows the results separately for the different decisions. Each decision was coded as a dichotomous variable (the woman is involved vs. not involved in the respective decision), and FE linear regression models were estimated. The models controlled for employment, household wealth, age groups, and wave. The association with the transition to a higher-order birth is only statistically significant for deciding what food should be cooked. However, the heterogeneity analyses show substantially higher decision-making power in several domains after the birth of a second child among women with only compulsory education and women living in rural areas. The interaction term between the transition to a higher-order birth and education is statistically significant for decisions about large household purchases, medical care, and buying clothes. For example, women with only a compulsory education are 15% more likely to be involved in decisions about large household purchases after the second birth. For women with at least an intermediate education, this probability is only 5% higher after the second birth. Looking at the interaction term between the transition to a higher-order birth and residence, a statistically significant coefficient is found for decisions about daily-need household purchases, cooking food, and medical care.

Figure 4: Fixed effects linear regression coefficients of transition to a higher-order birth on women's involvement in decision-making, shown separately for each item.



Notes: All models controlled for employment, household wealth, age groups, and wave. Full models are presented in Tables A4–A6.

Discussion and conclusions

This study investigated whether birth transitions change women's agency in Egypt, the most populous country in the MENA region. To do so, I used panel data from the Egypt Labor Market Panel Survey and estimated fixed effects regression models. Since these models account for all time-constant individual-specific unobserved heterogeneity, they rest on weaker assumptions for identifying causal effects than those of methods used in previous studies. The study's results add to knowledge about the variability of women's instrumental agency over the life course. They indicate that births might change agency, although not necessarily across all of its dimensions, highlighting the importance of considering the multidimensionality of agency. Moreover, observed differences by educational attainment and rural or urban residence indicate that the potential impact of birth transitions on women's agency might not be equal for all groups of women.

In the analysis, I compared women's agency before and after their first birth (transition to motherhood) and before and after their second birth (transition to a higher-order birth). The

results showed no evident association between motherhood and women's decision-making power, which is at odds with Samari's (2017a) findings for Egypt, but consistent with Friedrich et al.'s (2021) findings for three MENA countries and Reed's (2021) results in India. One explanation could be an anticipation effect due to the short time gap between marriage and first birth in Egypt. If a newly married couple is already preparing for parenthood and expects a first birth soon, the woman's status might not increase further with the transition to motherhood. On the other hand, the results showed a positive association with women's involvement in decision-making for the transition to a higher-order birth. This finding is in line with those from Samari (2017a), who also found a positive association between subsequent births and women's decision-making power in Egypt.

Moreover, the results indicate that the potential impact of the transition to a higher-order birth on women's involvement in decision-making might differ by women's educational attainment and rural or urban residence. The association between women's involvement in decision-making and the transition to a higher-order birth is stronger for low-educated women and those living in rural areas than for women with at least an intermediate education and those living in urban areas. This supports the theoretical argument that the ways in which a woman could increase her agency through childbearing are based on a patriarchal context with a traditional gender division of responsibilities in which a woman's value is tied to having children. Thus, the potential positive impacts of childbearing on agency appear greater for women who are more limited to the mother role and live in a more patriarchal context. For women living in urban areas, the results even showed a negative association between decision-making power and the transition to motherhood. An additional analysis of women's decision-making indicates that the higher decision-making involvement of low-educated women and women living in rural areas after having (an) additional child(ren) is not entirely driven by greater participation in decisions related to household responsibilities but also by greater involvement in decisions about their own health care or buying clothes. This gain in decision-making power suggests that women's greater agency might result not only from an increase in household tasks but also from an increase in women's value and position after childbirth transitions.

The results on freedom of movement and financial autonomy do not closely match the findings of previous studies. For access to household money, the results showed no substantial positive associations between birth transitions and agency, which is at odds with the findings of Reed (2021) for India and the results of Friedrich et al. (2021), a cross-sectional study that

found positive associations between women's financial autonomy and motherhood in three MENA countries. Samari (2017a), Friedrich et al. (2021), and Reed (2021) also found a positive association between motherhood and women's mobility, but in this study, the influence of childbearing on women's freedom of movement was less clear. However, the heterogeneity analyses by women's residence revealed an intriguing result: After the transition to a higher-order birth, women's freedom of movement is lower for women living in urban areas but not for women living in rural areas.

One possible explanation for the positive associations between motherhood and agency in previous analyses in Egypt (Friedrich et al. 2021; Samari 2017a) and the pooled regression models in Table A1 may be that they could not account for infertility, about which the ELMPS does not provide information. Infertility might act as a confounder of the relationship between motherhood and agency, as it can be expected to affect both motherhood and agency negatively. The FE models account for infertility.

Although the method used in this study is better suited to answer whether childbearing changes women's agency in the MENA region than the methods used in previous studies, this study's analyses have some shortcomings. First, although FE regression models do not rest on the strong assumption of exogeneity of the time-constant unobserved heterogeneity, time-varying heterogeneity can still bias the FE estimates. Although I attempted to account for all relevant observable time-variant confounders, I cannot eliminate the possibility that the assumption of exogeneity of time-varying unobserved heterogeneity may be violated. Thus, a causal effect cannot be identified with confidence. Second, due to the six-year time gap between the ELMPS waves, it was impossible to analyze the effect of each birth transition on women's agency separately. This is a limitation, as I do not assume a linear association between number of children and women's agency. Instead, the effects of the first and second birth on agency likely differ, and an upper bound probably exists—for example, the fourth or fifth birth might have no additional effect on agency. Third, in the analytic subsamples, the number of women who experienced the transition to motherhood is much smaller (439) than the number of those who experienced the transition to a higher-order birth (1002). This is because Egyptian women give birth to a first child on average about one year after marriage (Gebel and Heyne 2014). Fourth, I analyzed only one country (Egypt), and generalizations of this study's findings to other MENA countries or other countries with a patriarchal context require further investigation. Additional panel analyses on women's agency and childbirth in other countries

are needed, especially since Friedrich et al. (2021) found differences in the association between motherhood and agency across three MENA countries (Egypt, Jordan, and Tunisia).

Finally, this paper draws attention to several other aspects that should be investigated in future studies. First, it remains an open question why this study found a positive influence of birth transitions on women's decision-making power but no apparent impact on other dimensions of women's instrumental agency (access to household money and freedom of movement). It seems that women's constraints on financial autonomy and mobility are more persistent than constraints on decision-making—at least according to the results of this study. To shed light on this matter, further research should explore the specific mechanisms behind the impact of fertility on each dimension of women's agency. The causal mechanisms through which childbirth transitions might influence agency are neither well understood nor sufficiently discussed. Qualitative data on the importance of childbearing for women's social position and on work-family conflict in the MENA region would help to further our understanding of these mechanisms. Second, future research could examine not only how each birth transition influences agency but also whether the effect of a first birth differs by the gender of the child. This would require panel data with shorter time intervals between survey waves. Due to son preference in Egypt (El-Zeini 2008; Yount 2005), the birth of a son as a first child might improve women's social position more than the birth of a daughter, a phenomenon observed in the context of China (Li and Wu 2011). Lastly, this paper demonstrates the variability of women's instrumental agency over their life course. Future research could also study whether other critical life course transitions, such as marriage or school-to-work transitions, influence women's agency. Moreover, the finding that births might change women's agency draws attention to possible reverse causality when studying the impact of women's agency on fertility. Future studies on this topic must consider and address this issue.

References

Abraham, M., Auspurg, K., and Hinz, T. (2010). Migration decisions within dual-earner partnerships: A test of bargaining theory. *Journal of Marriage and Family*, *72*(4), 876–892. https://doi.org/10.1111/j.1741-3737.2011.00868.x

Allison, P. D., and Waterman, R. P. (2002). Fixed-Effects negative binomial regression models. *Sociological Methodology*, *32*(1), 247–265. https://doi.org/10.1111/1467-9531.00117

Ambrosetti, E., Angeli, A., and Novelli, M. (2019). Ideal family size and fertility in Egypt: An

overview of recent trends. *Statistica*, *79*(2), 223–244. https://doi.org/10.6092/issn.1973-2201/8811

Ambrosetti, E., Angeli, A., and Novelli, M. (2021). Childbearing intentions among Egyptian men and women: The role of gender-equitable attitudes and women's empowerment. *Demographic Research*, *44*(51), 1229–1270. https://doi.org/10.4054/DemRes.2021.44.51

Angrist, J. D., and Pischke, J.-S. (2010). The credibility revolution in empirical economics: How better research design is taking the con out of econometrics. *Journal of Economic Perspectives*, *24*(2), 3–30. https://doi.org/10.1257/jep.24.2.3

Assaad, R., Hendy, R., Lassassi, M., and Yassin, S. (2020). Explaining the MENA paradox: Rising educational attainment yet stagnant female labor force participation. *Demographic Research*, *43*(28), 817–850. https://doi.org/10.4054/DemRes.2020.43.28

Atake, E. H., and Gnakou Ali, P. (2019). Women's empowerment and fertility preferences in high fertility countries in Sub-Saharan Africa. *BMC Women's Health*, *19*(54), 1–14. https://doi.org/10.1186/s12905-019-0747-9

Baxter, J., Buchler, S., Perales, F., and Western, M. (2015). A life-changing event: First births and men's and women's attitudes to mothering and gender divisions of labor. *Social Forces*, *93*(3), 989–1014. https://doi.org/10.1093/sf/sou103

Baxter, J., Hewitt, B., and Haynes, M. (2008). Life course transitions and housework: Marriage, parenthood, and time on housework. *Journal of Marriage and Family*, *70*(2), 259–272. https://doi.org/ht10.1111/j.1741-3737.2008.00479.x

Bittman, M., England, P., Sayer, L., Folbre, N., and Matheson, G. (2003). When does gender trump money? Bargaining and time in household work. *American Journal of Sociology*, *109*(1), 186–214. https://doi.org/10.1086/378341

Blood, R. O., and Wolfe, D. M. (1965). *Husbands and wives. The dynamics of married living*. New York: Free Press.

Breen, R., Karlson, K. B., and Holm, A. (2018). Interpreting and understanding logits, probits, and other nonlinear probability models. *Annual Review of Sociology*, *44*, 39–54. https://doi.org/10.1146/annurev-soc-073117-041429

Brüderl, J., and Ludwig, V. (2015). Fixed-effects panel regression. In H. Best and C. Wolf (Eds.), *Regression analysis and causal inference* (pp. 327–358). Sage. https://doi.org/10.4135/9781446288146

Budig, M. J., and England, P. (2001). The wage penalty for motherhood. *American Sociological Review*, *66*(2), 204–225. https://doi.org/10.2307/2657415

Bünning, M. (2020). Paternal part-time employment and fathers' long-term involvement in

child care and housework. *Journal of Marriage and Family*, *82*(2), 566–586. https://doi.org/10.1111/jomf.12608

Charmes, J., Dedeoglu, S., Guessoam, S., and Jabiri, A. (2015). *Enhancing women's voice, agency and participation in the economy. Studies in Egypt, Jordan, Morocco, Tunisia and Turkey.* European Bank of Reconstruction and Development. https://www.ebrd.com/documents/comms-and-bis/enhancing-womens-voice-agency-and-participation-semed-and-turkey.pdf

Cheong, Y. F., Yount, K. M., and Crandall, A. A. (2017). Longitudinal measurement invariance of the women's agency scale. *Bulletin de Methodologie Sociologique*, *134*(1), 24–36. https://doi.org/10.1177%2F0759106317693787

Cooke, L. P. (2006). "Doing" gender in context: Household bargaining and risk of divorce in Germany and the United States. *American Journal of Sociology*, *112*(2), 442–472. https://doi.org/10.1086/506417

Doan, R. M., and Bisharat, L. (1990). Female autonomy and child nutritional status: The extended-family residential unit in Amman, Jordan. *Social Science and Medicine*, *31*(7), 783–789. https://doi.org/10.1016/0277-9536(90)90173-p

Doepke, M., and Tertilt, M. (2018). Women's empowerment, the gender gap in desired fertility, and fertility outcomes in developing countries. *AEA Papers and Proceedings*, *108*, 358–362. https://doi.org/10.1257/pandp.20181085

Economic Research Forum, and Central Agency for Public Mobilization and Statistics (2019). Egypt Labor Market Panel Survey, ELMPS (2018). Version 2.0 of the licensed data files (October, 2019), provided by the Economic Research Forum. http://www.erfdataportal.com/index.php/catalog.

El-Zeini, L. O. (2008). The path to replacement fertility in Egypt: Acceptance, preference, and achievement. *Studies in Family Planning*, *39*(3), 161–176. https://doi.org/10.1111/j.1728-4465.2008.164.x

Eltigani, E. E. (2000). Changes in family-building patterns in Egypt and Morocco: A comparative analysis. *International Family Planning Perspectives*, *26*(2), 73–78. https://doi.org/10.2307/2648270

Eltigani, E. E. (2009). Toward replacement fertility in Egypt and Tunisia. *Studies in Family Planning*, *40*(3), 215–226. https://doi.org/10.1111/j.1728-4465.2009.00204.x

Elwert, F., and Winship, C. (2014). Endogenous selection bias: The problem of conditioning on a collider variable. *Annual Review of Sociology*, *176*(40), 31–53. https://doi.org/10.1146/annurev-soc-071913-043455

Engelhardt, H., Schulz, F., and Büyükkeçeci, Z. (2018). *Demographic and human development in the Middle East and North Africa*. Bamberg: University of Bamberg Press. https://doi.org/10.20378/irbo-50993

Friedrich, C., Engelhardt, H., and Schulz, F. (2021). Women's agency in Egypt, Jordan, and Tunisia: The role of parenthood and education. *Population Research and Policy Review*, *40*(5), 1025–1059. https://doi.org/10.1007/s11113-020-09622-7

Gebel, M., and Heyne, S. (2014). *Transitions to adulthood in the Middle East and North Africa: Young women's rising?* Basingstoke: Palgrave Macmillan. https://doi.org/10.1057/9781137355560

Haque, R., Alam, K., Rahman, S. M., Keramat, S. A., and Al-Hanawi, M. K. (2021). Women's empowerment and fertility decision-making in 53 low and middle resource countries: a pooled analysis of demographic and health surveys. *BMJ Open*, *11*(6), 1–12. https://doi.org/10.1136/bmjopen-2020-045952

Heer, D. M. (1963). The measurement and bases of family power: A rejoinder. *Marriage and Family Living*, *25*(2), 133–139. https://doi.org/10.2307/349050

Hendy, R. (2015). Women's participation in the Egyptian labor market. In R. Assaad and C. Krafft (Eds.), *The Egyptian labor market in an era of revolution* (pp. 147–161). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198737254.003.0008

Henry, H. M. (2011). Egyptian women and empowerment: A cultural perspective. *Women's Studies International Forum*, *34*(3), 251–259. https://doi.org/10.1016/j.wsif.2011.03.001

Hoodfar, H. (1997). *Between marriage and the market: Intimate politics and survival in Cairo*. Berkeley: University of California Press.

Hsu, C.-H. (2021). Parity-specific motherhood penalties: Long-term impacts of childbirth on women's earnings in Japan. *Advances in Life Course Research*, *50*, 100435. https://doi.org/10.1016/j.alcr.2021.100435

International Labour Organization (2022). International Labour Organization. ILOSTAT Database. Labour Force Participation Rate by Sex and Age. https://ilostat.ilo.org/data/

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, *30*(3), 435–464. https://doi.org/10.1111/1467-7660.00125

Kandiyoti, D. (1988). Bargaining with patriarchy. *Gender and Society*, *2*(3), 274–290. https://doi.org/10.1177/089124388002003004

Keo, C., Krafft, C., and Fedi, L. (2022). Rural Women in Egypt. In C. Krafft and R. Assaad (Eds.), *The Egyptian labor market: A focus on gender and vulnerability* (pp. 225–256).

Oxford University Press. https://doi.org/10.1093/oso/9780192847911.003.0009

Killewald, A., and García-Manglano, J. (2016). Tethered lives: A couple-based perspective on the consequences of parenthood for time use, occupation, and wages. *Social Science Research*, *60*, 266–282. https://doi.org/10.1016/j.ssresearch.2016.03.007

Kishor, S. (2000). Empowerment of women in Egypt and links to the survival and health of their infants. In H. Presser and G. Sen (Eds.), *Women's empowerment and demographic processes* (pp. 119–156). Oxford/New York: Oxford University Press.

Klugman, J., Hammer, L., Twigg, S., Hasan, T., McCleary-Sills, J., and Santamaria, J. (2014). *Voice and agency: Empowering women and girls for shared prosperity*. Washington, DC: International Bank for Reconstruction and Development, The World Bank.

Krafft, C., Assaad, R., and Keo, C. (2022). The evolution of labor supply in Egypt, 1988–2018. A gendered analysis. In C. Krafft and R. Assaad (Eds.), *The Egyptian labor market: A focus on gender and vulnerability* (pp. 13–48). Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780192847911.003.0002

Krafft, C., Assaad, R., and Rahman, K. W. (2019). Introducing the Egypt Labor Market Panel Survey 2018. ERF Working Paper Series No. 1360. Dokki, Egypt: The Economic Research Forum.

Kühhirt, M. (2012). Childbirth and the long-term division of labour within couples: How do substitution, bargaining power, and norms affect parents' time Allocation in West Germany? *European Sociological Review*, *28*(5), 565–582. https://doi.org/10.1093/esr/jcr026

Li, L., and Wu, X. (2011). Gender of children, bargaining power, and intrahousehold resource allocation in China. *Journal of Human Resources*, *46*(2), 295–316. https://doi.org/10.3368/jhr.46.2.295

Lundberg, S., and Pollak, R. A. (1996). Bargaining and distribution in marriage. *Journal of Economic Perspectives*, *10*(4), 139–158. https://doi.org/10.1257/jep.10.4.139

Matysiak, A., Mencarini, L., and Vignoli, D. (2016). Work-family conflict moderates the relationship between childbearing and subjective well-being. *European Journal of Population*, *32*(3), 355–379. https://doi.org/10.1007/s10680-016-9390-4

Miles, R. (2002). Employment and unemployment in Jordan: The importance of the gender system. *World Development*, *30*(3), 413–427. https://doi.org/10.1016/S0305-750X(01)00123-1

Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], and ICF International (2015). *Egypt Demographic and Health Survey 2014*. Cairo,

Egypt/Rockville, Maryland, USA: Ministry of Health and Population and ICF International.

Moghadam, V. M. (2004). Patriarchy in transition: Women and the changing family in the Middle East. *Journal of Comparative Family Studies*, *35*(2), 137–162. https://doi.org/10.3138/JCFS.35.2.137

Moghadam, V. M. (2020). Gender regimes in the Middle East and North Africa: The power of feminist movements. *Social Politics*, *27*(3), 467–485. https://doi.org/10.1093/sp/jxaa019

Mood, C. (2010). Logistic regression: Why we cannot do what we think we can do, and what we can do about it. *European Sociological Review*, *26*(1), 67–82. https://doi.org/10.1093/esr/jcp006

Musick, K., Bea, M. D., and Gonalons-Ponsc, P. (2020). His and her earnings following parenthood in the United States, Germany, and the United Kingdom. *American Sociological Review*, *85*(4), 639–674. https://doi.org/10.1177/0003122420934430

Myrskylä, M., and Margolis, R. (2014). Happiness: Before and after the kids. *Demography*, *51*(5), 1843–1866. https://doi.org/10.1007/s13524-014-0321-x

OECD (2017). *Women's economic empowerment in selected MENA countries. The impact of legal frameworks in Algeria, Egypt, Jordan, Libya, Morrocco and Tunisia*. Paris: Competitiveness and Private Sector Development, OECD Publishing. https://doi.org/10.1787/9789264279322-en

Reed, M. N. (2021). Reproductive transitions and women's status in Indian households. *Population Studies*, *75*(3), 325–341. https://doi.org/10.1080/00324728.2021.1904147

Richardson, R. A. (2018). Measuring women's empowerment: A critical review of current practices and recommendations for researchers. *Social Indicators Research*, *137*(2), 539–557. https://doi.org/10.1007/s11205-017-1622-4

Rutstein, S. O., and Shah, I. H. (2004). *Infecundity, infertility, and childlessness in developing countries*. DHS Comparative Reports No. 9. Calverton, Maryland, USA: ORC Macro and the World Health Organization. https://dhsprogram.com/pubs/pdf/CR9/CR9.pdf

Salem, R., Cheong, Y. F., and Yount, K. M. (2018). Is women's work a pathway to their agency in rural Minya, Egypt? *Social Indicators Research*, *136*(2), 807–831. https://doi.org/10.1007/s11205-017-1573-9

Samari, G. (2017a). First birth and the trajectory of women's empowerment in Egypt. *BMC Pregnancy and Childbirth*, *17*(Suppl 2), 43–55. https://doi.org/10.1186/s12884-017-1494-2

Samari, G. (2017b). Women's agency and fertility: Recent evidence from Egypt. *Population*

Research and Policy Review, *36*(4), 561–582. https://doi.org/10.1007/s11113-017-9427-3

Samari, G. (2019a). Education and fertility in Egypt: Mediation by women's empowerment. *SSM - Population Health*, *9*, 1–9. https://doi.org/10.1016/j.ssmph.2019.100488

Samari, G. (2019b). Women's empowerment in Egypt: the reliability of a complex construct. *Sexual and Reproductive Health Matters*, *27*(1). https://doi.org/10.1080/26410397.2019.1586816

Samari, G., and Pebley, A. R. (2018). Longitudinal determinants of married women's autonomy in Egypt. *Gender, Place & Culture*, *25*(1), 1–22. https://doi.org/10.1080/0966369X.2018.1473346

Selwaness, I., and Krafft, C. (2021). The dynamics of family formation and women's work: What facilitates and hinders female employment in the Middle East and North Africa? *Population Research and Policy Review*, *40*(3), 533–587. https://doi.org/10.1007/s11113-020-09596-6

Shroff, M. R., Griffiths, P., Adair, L., Suchindran, C., and Bentley, M. (2009). Maternal autonomy is inversely related to child stunting in Andhra Pradesh, India. *Maternal and Child Nutrition*, *5*(1), 64–74. https://doi.org/10.1111/j.1740-8709.2008.00161.x

Shroff, M. R., Griffiths, P. L., Suchindran, C., Nagalla, B., Vazir, S., and Bentley, M. E. (2011). Does maternal autonomy influence feeding practices and infant growth in rural India? *Social Science and Medicine*, *73*(3), 447–455. https://doi.org/10.1016/j.socscimed.2011.05.040

Tadros, M. (2010). Egypt. In S. Kelly and J. Breslin (Eds.), *Women's rights in the Middle East and North Africa: Progress amid Resistance* (pp. 89–120). Freedom House.

Thorpe, S., VanderEnde, K., Peters, C., Bardin, L., and Yount, K. M. (2016). The influence of women's empowerment on child immunization coverage in low, lower-middle, and upper-middle income countries: A systematic review of the literature. *Maternal and Child Health Journal*, *20*(1), 172–186. https://doi.org/10.1007/s10995-015-1817-8

Upadhyay, U. D., Gipson, J. D., Withers, M., Lewis, S., Ciaraldi, E. J., Fraser, A., … Prata, N. (2014). Women's empowerment and fertility: A review of the literature. *Social Science and Medicine*, *115*, 111–120. https://doi.org/10.1016/j.socscimed.2014.06.014

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. Cambridge, Massachusetts/London, England: MIT Press.

World Economic Forum (2021). *Global Gender Gap Report 2021. Insight report.* Cologny/Geneva: World Economic Forum. https://www3.weforum.org/docs/WEF_GGGR_2021.pdf

Yount, K. M. (2005). Women's family power and gender preference in Minya, Egypt. *Journal of Marriage and Family*, *67*(2), 410–428. https://doi.org/10.1111/j.0022-2445.2005.00125.x

Yount, K. M., Dijkerman, S., Zureick-Brown, S., and VanderEnde, K. E. (2014). Women's empowerment and generalized anxiety in Minya, Egypt. *Social Science and Medicine*, *106*, 185–193. https://doi.org/10.1016/j.socscimed.2014.01.022

Yount, K. M., VanderEnde, K. E., Dodell, S., and Cheong, Y. F. (2016). Measurement of women's agency in Egypt: A national validation study. *Social Indicators Research*, *128*(3), 1171–1192. https://doi.org/10.1007/s11205-015-1074-7

Appendix

Table A1: Fixed effects and pooled Poisson regressions of transition to motherhood and transition to a higher-order birth on women's involvement in decision-making and freedom of movement. Fixed effects linear regressions and pooled OLS regressions of transition to motherhood and transition to a higher-order birth on women's access to household money.

	Involvement in decision-making				Access to household money				Freedom of movement			
	Transition to motherhood		Transition to higher-order birth		Transition to motherhood		Transition to higher-order birth		Transition to motherhood		Transition to higher-order birth	
	FE	Pooled Poisson	FE	Pooled Poisson	FE	Pooled OLS	FE	Pooled OLS	FE	Pooled Poisson	FE	Pooled Poisson
Birth transition	-0.019	0.012	0.082*	-0.001	-0.031	0.044**	0.023	0.004	0.101	0.240***	-0.119	0.092***
	(0.051)	(0.012)	(0.036)	(0.009)	(0.054)	(0.015)	(0.041)	(0.011)	(0.164)	(0.043)	(0.114)	(0.028)
Employed	-0.097	0.029***	-0.063	0.029***	-0.001	0.099***	0.091*	0.100***	0.041	0.165***	0.079	0.166***
	(0.052)	(0.008)	(0.036)	(0.008)	(0.055)	(0.009)	(0.038)	(0.009)	(0.141)	(0.024)	(0.104)	(0.024)
Household wealth	0.018	0.067***	0.030	0.067***	0.028	0.059***	0.008	0.058***	0.135	0.021	0.007	0.021
	(0.033)	(0.003)	(0.021)	(0.003)	(0.033)	(0.004)	(0.022)	(0.004)	(0.091)	(0.011)	(0.058)	(0.011)
Age groups (ref. = 15-19)												
20-24	0.019	0.090**	0.007	0.095**	0.219*	0.105***	0.016	0.119***	0.409	0.006	-0.159	0.061
	(0.084)	(0.030)	(0.084)	(0.030)	(0.085)	(0.030)	(0.090)	(0.030)	(0.250)	(0.085)	(0.196)	(0.085)
25-29	0.051	0.127***	-0.001	0.133***	0.251*	0.178***	-0.006	0.197***	0.644	0.187*	-0.068	0.240**
	(0.117)	(0.029)	(0.095)	(0.029)	(0.117)	(0.030)	(0.106)	(0.030)	(0.345)	(0.085)	(0.238)	(0.084)
30-34	0.032	0.145***	-0.030	0.152***	0.218	0.191***	-0.107	0.211***	0.669	0.189*	-0.127	0.236**
	(0.165)	(0.029)	(0.119)	(0.030)	(0.168)	(0.030)	(0.133)	(0.030)	(0.485)	(0.085)	(0.313)	(0.086)
35-39	-0.046	0.157***	-0.058	0.164***	0.198	0.214***	-0.241	0.234***	0.872	0.289***	-0.146	0.334***
	(0.214)	(0.030)	(0.147)	(0.030)	(0.217)	(0.030)	(0.165)	(0.031)	(0.598)	(0.085)	(0.394)	(0.086)
40-44	-0.021	0.154***	-0.152	0.162***	0.164	0.218***	-0.273	0.238***	1.273	0.330***	-0.193	0.374***
	(0.268)	(0.030)	(0.178)	(0.030)	(0.277)	(0.031)	(0.199)	(0.031)	(0.746)	(0.087)	(0.471)	(0.088)
45-49	0.130	0.137***	-0.160	0.144***	0.286	0.235***	-0.283	0.255***	0.750	0.274**	-0.098	0.315***
	(0.329)	(0.031)	(0.224)	(0.031)	(0.335)	(0.032)	(0.249)	(0.032)	(0.950)	(0.090)	(0.598)	(0.091)
Wave (ref. = 2006)												
2012	0.109	-0.015	0.008	-0.015	-0.026	-0.108***	0.061	-0.108***	-0.408	-0.476***	-0.188	-0.480***
	(0.077)	(0.009)	(0.054)	(0.009)	(0.086)	(0.010)	(0.060)	(0.010)	(0.231)	(0.026)	(0.154)	(0.026)
2018	0.300*	0.076***	0.127	0.076***	0.188	0.021*	0.339**	0.021*	0.124	0.071**	0.666*	0.067**
	(0.142)	(0.008)	(0.097)	(0.008)	(0.156)	(0.010)	(0.108)	(0.010)	(0.424)	(0.023)	(0.274)	(0.023)
Number of persons	553	15,063	1,093	15,063	554	15,063	1,098	15,063	366	15,063	847	15,063
Person-years	1,289	15,063	2,606	15,063	1,291	15,063	2,616	15,063	876	15,063	2,057	15,063

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001. Based on individual-clustered standard errors (in parentheses).

Table A2: Fixed effects poisson regressions of transition to motherhood and transition to a higher-order birth on women's involvement in decision-making and freedom of movement, and fixed effects linear regressions of transition to motherhood and transition to a higher-order birth on women's access to household money; includes an interaction term between birth transition and educational level.

	Involvement in decision-making		Access to household money		Freedom of movement	
	Transition to motherhood	Transition to higher-order birth	Transition to motherhood	Transition to higher-order birth	Transition to motherhood	Transition to higher-order birth
Birth transition	0.019	0.157***	0.046	0.057	0.056	-0.184
	(0.069)	(0.046)	(0.070)	(0.050)	(0.226)	(0.137)
Transition*Intermediate and above	-0.054	-0.100**	-0.112	-0.046	0.061	0.088
	(0.062)	(0.036)	(0.060)	(0.039)	(0.182)	(0.100)
Employed	-0.097	-0.064	0.002	0.091*	0.039	0.080
	(0.052)	(0.036)	(0.056)	(0.038)	(0.141)	(0.103)
Household wealth	0.020	0.034	0.032	0.009	0.132	0.002
	(0.033)	(0.020)	(0.033)	(0.022)	(0.092)	(0.058)
Age groups (ref. = 15-19)						
20-24	0.008	-0.024	0.198*	0.003	0.419	-0.130
	(0.087)	(0.085)	(0.087)	(0.090)	(0.257)	(0.202)
25-29	0.037	-0.036	0.226	-0.021	0.663	-0.034
	(0.120)	(0.096)	(0.119)	(0.106)	(0.357)	(0.245)
30-34	0.019	-0.056	0.198	-0.117	0.685	-0.099
	(0.167)	(0.119)	(0.170)	(0.133)	(0.494)	(0.318)
35-39	-0.060	-0.075	0.179	-0.247	0.891	-0.126
	(0.217)	(0.147)	(0.219)	(0.165)	(0.607)	(0.397)
40-44	-0.043	-0.167	0.131	-0.278	1.299	-0.170
	(0.271)	(0.177)	(0.280)	(0.199)	(0.758)	(0.473)
45-49	0.108	-0.173	0.255	-0.287	0.775	-0.082
	(0.332)	(0.224)	(0.338)	(0.249)	(0.960)	(0.599)
Wave (ref. = 2006)						
2012	0.111	-0.004	-0.026	0.056	-0.410	-0.178
	(0.077)	(0.054)	(0.086)	(0.060)	(0.232)	(0.153)
2018	0.302*	0.107	0.187	0.330**	0.122	0.681*
	(0.143)	(0.096)	(0.157)	(0.108)	(0.424)	(0.274)
Number of persons	553	1,093	554	1,098	366	847
Person-years	1,289	2,606	1,291	2,616	876	2,057

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001. Based on individual-clustered standard errors (in parentheses).

Table A3: Fixed effects poisson regressions of transition to motherhood and transition to a higher-order birth on women's involvement in decision-making and freedom of movement, and fixed effects linear regressions of transition to motherhood and transition to a higher-order birth on women's access to household money; includes an interaction term between birth transition and residence (rural or urban).

	Involvement in decision-making		Access to household money		Freedom of movement	
	Transition to motherhood	Transition to higher-order birth	Transition to motherhood	Transition to higher-order birth	Transition to motherhood	Transition to higher-order birth
Birth transition	0.040	0.136***	0.021	0.049	0.263	-0.006
	(0.061)	(0.039)	(0.061)	(0.046)	(0.173)	(0.124)
Transition*Urban	-0.125*	-0.105***	-0.118	-0.054	-0.339*	-0.211*
	(0.055)	(0.032)	(0.060)	(0.037)	(0.165)	(0.098)
Employed	-0.100	-0.073*	-0.001	0.087*	0.030	0.052
	(0.052)	(0.036)	(0.055)	(0.038)	(0.142)	(0.104)
Household wealth	0.026	0.035	0.035	0.010	0.163	0.019
	(0.033)	(0.020)	(0.033)	(0.022)	(0.092)	(0.059)
Age groups (ref. = 15-19)						
20-24	-0.002	0.001	0.202*	0.014	0.346	-0.170
	(0.085)	(0.084)	(0.086)	(0.091)	(0.248)	(0.196)
25-29	0.030	-0.013	0.233*	-0.012	0.568	-0.100
	(0.117)	(0.095)	(0.118)	(0.106)	(0.343)	(0.239)
30-34	0.019	-0.035	0.209	-0.109	0.591	-0.153
	(0.165)	(0.119)	(0.169)	(0.133)	(0.488)	(0.314)
35-39	-0.054	-0.055	0.193	-0.240	0.805	-0.155
	(0.214)	(0.147)	(0.217)	(0.165)	(0.600)	(0.395)
40-44	-0.025	-0.139	0.163	-0.266	1.184	-0.183
	(0.267)	(0.178)	(0.278)	(0.199)	(0.752)	(0.472)
45-49	0.131	-0.136	0.290	-0.271	0.667	-0.070
	(0.329)	(0.224)	(0.336)	(0.250)	(0.957)	(0.599)
Wave (ref. = 2006)						
2012	0.104	0.005	-0.030	0.060	-0.410	-0.189
	(0.077)	(0.054)	(0.086)	(0.060)	(0.235)	(0.154)
2018	0.286*	0.115	0.177	0.334**	0.126	0.649*
	(0.142)	(0.097)	(0.157)	(0.108)	(0.429)	(0.274)
Number of persons	553	1,093	554	1,098	366	847
Person-years	1,289	2,606	1,291	2,616	876	2,057

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001. Based on individual-clustered standard errors (in parentheses).

Table A4: Fixed effects linear regressions of transition to a higher-order birth on women's involvement in decision-making, shown separately for each item.

	Large household purchases	Daily-need household purchases	Visits	Cooking food	Medical treatment or advice	Buying clothes
Birth transition	0.082	0.070	0.062	0.129***	0.048	-0.016
	(0.045)	(0.038)	(0.042)	(0.033)	(0.038)	(0.035)
Employed	0.019	-0.048	-0.058	-0.074*	-0.041	-0.063
	(0.041)	(0.035)	(0.040)	(0.031)	(0.040)	(0.039)
Household wealth	0.024	0.024	0.006	0.024	0.038	0.019
	(0.024)	(0.022)	(0.022)	(0.019)	(0.021)	(0.019)
Age groups (ref. = 15-19)						
20-24	-0.037	-0.074	-0.005	0.125	-0.014	0.019
	(0.097)	(0.092)	(0.097)	(0.078)	(0.083)	(0.078)
25-29	-0.021	-0.086	-0.084	0.157	-0.048	0.034
	(0.113)	(0.106)	(0.110)	(0.090)	(0.098)	(0.091)
30-34	0.006	-0.188	-0.059	0.153	-0.046	-0.006
	(0.144)	(0.130)	(0.136)	(0.112)	(0.123)	(0.117)
35-39	0.042	-0.229	-0.084	0.132	-0.059	-0.045
	(0.179)	(0.160)	(0.169)	(0.136)	(0.152)	(0.143)
40-44	-0.050	-0.336	-0.140	0.070	-0.144	-0.053
	(0.218)	(0.196)	(0.201)	(0.167)	(0.187)	(0.174)
45-49	0.081	-0.358	-0.065	0.144	-0.287	-0.194
	(0.271)	(0.247)	(0.262)	(0.206)	(0.233)	(0.216)
Wave (ref. = 2006)						
2012	0.040	0.065	-0.022	-0.071	-0.040	0.036
	(0.068)	(0.056)	(0.061)	(0.051)	(0.056)	(0.052)
2018	0.109	0.163	0.105	-0.054	0.041	0.155
	(0.122)	(0.101)	(0.109)	(0.091)	(0.099)	(0.092)
Number of persons	1,098	1,098	1,098	1,098	1,098	1,098
Person-years	2,616	2,616	2,616	2,616	2,616	2,616

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001. Based on individual-clustered standard errors (in parentheses).

Table A5: Fixed effects linear regressions of transition to a higher-order birth on women's involvement in decision-making, shown separately for each item; includes an interaction term between birth transition and educational level.

	Large household purchases	Daily-need household purchases	Visits	Cooking food	Medical treatment or advice	Buying clothes
Birth transition	0.157**	0.050	0.111*	0.162***	0.107*	0.056
	(0.054)	(0.046)	(0.051)	(0.043)	(0.048)	(0.043)
Transition*Intermediate and above	-0.102*	0.028	-0.067	-0.046	-0.081*	-0.098**
	(0.042)	(0.036)	(0.039)	(0.034)	(0.037)	(0.035)
Employed	0.019	-0.048	-0.058	-0.074*	-0.040	-0.062
	(0.041)	(0.035)	(0.040)	(0.031)	(0.040)	(0.040)
Household wealth	0.027	0.023	0.008	0.025	0.040	0.021
	(0.024)	(0.022)	(0.022)	(0.019)	(0.021)	(0.019)
Age groups (ref. = 15-19)						
20-24	-0.066	-0.066	-0.024	0.112	-0.037	-0.009
	(0.097)	(0.092)	(0.097)	(0.079)	(0.084)	(0.078)
25-29	-0.053	-0.077	-0.106	0.143	-0.074	0.002
	(0.113)	(0.106)	(0.110)	(0.090)	(0.099)	(0.092)
30-34	-0.017	-0.182	-0.074	0.142	-0.065	-0.028
	(0.143)	(0.130)	(0.136)	(0.112)	(0.123)	(0.116)
35-39	0.029	-0.226	-0.093	0.126	-0.070	-0.059
	(0.178)	(0.160)	(0.168)	(0.136)	(0.152)	(0.142)
40-44	-0.062	-0.332	-0.148	0.064	-0.154	-0.064
	(0.216)	(0.196)	(0.200)	(0.168)	(0.187)	(0.173)
45-49	0.072	-0.356	-0.071	0.140	-0.294	-0.202
	(0.270)	(0.247)	(0.261)	(0.207)	(0.232)	(0.215)
Wave (ref. = 2006)						
2012	0.028	0.068	-0.030	-0.077	-0.050	0.025
	(0.068)	(0.057)	(0.061)	(0.052)	(0.056)	(0.051)
2018	0.089	0.169	0.091	-0.064	0.025	0.135
	(0.122)	(0.102)	(0.109)	(0.091)	(0.099)	(0.091)
Number of persons	1,098	1,098	1,098	1,098	1,098	1,098
Person-years	2,616	2,616	2,616	2,616	2,616	2,616

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001. Based on individual-clustered standard errors (in parentheses).

Table A6: Fixed effects linear regressions of transition to a higher-order birth on women's involvement in decision-making, shown separately for each item; includes an interaction term between birth transition and residence (rural or urban).

	Large household purchases	Daily-need household purchases	Visits	Cooking food	Medical treatment or advice	Buying clothes
Birth transition	0.112*	0.110**	0.090*	0.183***	0.085*	0.001
	(0.049)	(0.041)	(0.045)	(0.037)	(0.041)	(0.038)
Transition*Urban	-0.061	-0.081*	-0.057	-0.109***	-0.074*	-0.034
	(0.040)	(0.035)	(0.037)	(0.030)	(0.034)	(0.032)
Employed	0.015	-0.054	-0.063	-0.082**	-0.046	-0.065
	(0.041)	(0.035)	(0.041)	(0.031)	(0.040)	(0.040)
Household wealth	0.027	0.028	0.009	0.029	0.042*	0.020
	(0.024)	(0.022)	(0.023)	(0.019)	(0.021)	(0.019)
Age groups (ref. = 15-19)						
20-24	-0.040	-0.077	-0.008	0.120	-0.017	0.018
	(0.096)	(0.093)	(0.097)	(0.078)	(0.083)	(0.077)
25-29	-0.027	-0.094	-0.090	0.146	-0.055	0.030
	(0.113)	(0.107)	(0.110)	(0.089)	(0.098)	(0.091)
30-34	0.003	-0.192	-0.062	0.147	-0.050	-0.007
	(0.143)	(0.131)	(0.136)	(0.111)	(0.123)	(0.116)
35-39	0.044	-0.228	-0.083	0.134	-0.057	-0.045
	(0.179)	(0.161)	(0.169)	(0.135)	(0.153)	(0.142)
40-44	-0.042	-0.326	-0.133	0.082	-0.135	-0.049
	(0.218)	(0.197)	(0.201)	(0.166)	(0.187)	(0.174)
45-49	0.095	-0.340	-0.052	0.168	-0.271	-0.186
	(0.271)	(0.248)	(0.262)	(0.204)	(0.234)	(0.216)
Wave (ref. = 2006)						
2012	0.040	0.064	-0.022	-0.073	-0.041	0.036
	(0.068)	(0.056)	(0.061)	(0.051)	(0.056)	(0.052)
2018	0.103	0.155	0.099	-0.065	0.034	0.151
	(0.122)	(0.101)	(0.109)	(0.090)	(0.099)	(0.092)
Number of persons	1,098	1,098	1,098	1,098	1,098	1,098
Person-years	2,616	2,616	2,616	2,616	2,616	2,616

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001. Based on individual-clustered standard errors (in parentheses).

Table A7: Fixed effects poisson regressions of transition to motherhood and transition to a higher order birth on women's involvement in decision-making and freedom of movement, and fixed effects linear regressions of transition to motherhood and transition to a higher order birth on women's access to household money.

	Involvement in decision-making		Access to household money		Freedom of movement	
	Transition to motherhood	Transition to higher order birth	Transition to motherhood	Transition to higher order birth	Transition to motherhood	Transition to higher order birth
Birth transition(s)	-0.021	0.080*	-0.031	0.025	0.100	-0.120
	(0.051)	(0.036)	(0.054)	(0.041)	(0.165)	(0.114)
Household wealth	0.022	0.028	0.028	0.010	0.133	0.009
	(0.032)	(0.020)	(0.033)	(0.022)	(0.092)	(0.058)
Age groups (ref. = 15-19)						
20-24	0.022	0.012	0.219*	0.009	0.410	-0.167
	(0.084)	(0.084)	(0.085)	(0.089)	(0.250)	(0.195)
25-29	0.044	0.002	0.251*	-0.011	0.649	-0.072
	(0.117)	(0.095)	(0.117)	(0.105)	(0.344)	(0.237)
30-34	0.018	-0.024	0.218	-0.114	0.677	-0.136
	(0.165)	(0.119)	(0.168)	(0.132)	(0.484)	(0.313)
35-39	-0.073	-0.055	0.198	-0.245	0.888	-0.154
	(0.213)	(0.147)	(0.217)	(0.164)	(0.594)	(0.394)
40-44	-0.050	-0.149	0.164	-0.278	1.284	-0.202
	(0.267)	(0.178)	(0.277)	(0.199)	(0.745)	(0.471)
45-49	0.084	-0.160	0.286	-0.286	0.766	-0.112
	(0.329)	(0.225)	(0.334)	(0.249)	(0.946)	(0.598)
Wave (ref. = 2006)						
2012	(0.077)	0.007	-0.026	0.063	-0.412	-0.182
	0.315*	(0.054)	(0.086)	(0.060)	(0.231)	(0.154)
2018	(0.143)	0.123	0.188	0.345**	0.119	0.676*
	(0.077)	(0.097)	(0.156)	(0.108)	(0.423)	(0.274)
Number of persons	553	1,093	554	1,098	366	847
Person-years	1,289	2,606	1,291	2,616	876	2,057

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001. Based on individual-clustered standard errors (in parentheses).

Table A8: Fixed effects poisson regressions of transition to motherhood and transition to a higher order birth on women's involvement in decision-making and freedom of movement, and fixed effects linear regressions of transition to motherhood and transition to a higher order birth on women's access to household money. With interaction term between birth transition(s) and educational level.

	Involvement in decision-making		Access to household money		Freedom of movement	
	Transition to motherhood	Transition to higher order birth	Transition to motherhood	Transition to higher order birth	Transition to motherhood	Transition to higher order birth
Birth transition(s)	0.017	0.155***	0.046	0.059	0.054	-0.184
	(0.069)	(0.046)	(0.069)	(0.050)	(0.226)	(0.137)
Transition*Higher education	-0.054	-0.100**	-0.112	-0.046	0.063	0.087
	(0.062)	(0.037)	(0.060)	(0.039)	(0.181)	(0.100)
Household wealth	0.024	0.032	0.032	0.012	0.131	0.005
	(0.033)	(0.020)	(0.033)	(0.022)	(0.092)	(0.058)
Age groups (ref. = 15-19)						
20-24	0.011	-0.018	0.198*	-0.004	0.421	-0.139
	(0.086)	(0.085)	(0.087)	(0.089)	(0.257)	(0.200)
25-29	0.029	-0.032	0.226	-0.026	0.669	-0.040
	(0.120)	(0.096)	(0.118)	(0.105)	(0.356)	(0.244)
30-34	0.005	-0.051	0.199	-0.124	0.694	-0.109
	(0.167)	(0.119)	(0.170)	(0.132)	(0.493)	(0.317)
35-39	-0.087	-0.072	0.179	-0.251	0.906	-0.134
	(0.216)	(0.147)	(0.219)	(0.164)	(0.603)	(0.397)
40-44	-0.072	-0.164	0.131	-0.283	1.311	-0.180
	(0.271)	(0.177)	(0.279)	(0.199)	(0.757)	(0.473)
45-49	0.062	-0.172	0.256	-0.290	0.791	-0.096
	(0.333)	(0.224)	(0.337)	(0.249)	(0.955)	(0.599)
Wave (ref. = 2006)						
2012	0.121	-0.005	-0.026	0.057	-0.413	-0.173
	(0.077)	(0.054)	(0.086)	(0.060)	(0.231)	(0.154)
2018	0.317*	0.104	0.187	0.335**	0.116	0.691*
	(0.143)	(0.096)	(0.157)	(0.108)	(0.423)	(0.274)
Number of persons	553	1,093	554	1,098	366	847
Person-years	1,289	2,606	1,291	2,616	876	2,057

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001. Based on individual-clustered standard errors (in parentheses).

Table A9: Fixed effects poisson regressions of transition to motherhood and transition to a higher order birth on women's involvement in decision-making and freedom of movement, and fixed effects linear regressions of transition to motherhood and transition to a higher order birth on women's access to household money. With interaction term between birth transition(s) and residence (rural or urban).

	Involvement in decision-making		Access to household money		Freedom of movement	
	Transition to motherhood	Transition to higher order birth	Transition to motherhood	Transition to higher order birth	Transition to motherhood	Transition to higher order birth
Birth transition(s)	0.038	0.131***	0.021	0.054	0.263	-0.004
	(0.061)	(0.039)	(0.061)	(0.046)	(0.173)	(0.124)
Transition*Urban	-0.123*	-0.100**	-0.118	-0.059	-0.340*	-0.217*
	(0.055)	(0.032)	(0.060)	(0.037)	(0.165)	(0.098)
Household wealth	0.029	0.033	0.035	0.013	0.162	0.021
	(0.033)	(0.020)	(0.033)	(0.022)	(0.092)	(0.059)
Age groups (ref. = 15-19)						
20-24	0.002	0.131***	0.202*	0.007	0.347	-0.175
	(0.085)	(0.039)	(0.086)	(0.090)	(0.248)	(0.195)
25-29	0.022	-0.100**	0.233*	-0.017	0.572	-0.104
	(0.117)	(0.032)	(0.117)	(0.105)	(0.342)	(0.239)
30-34	0.005	0.033	0.209	-0.116	0.598	-0.159
	(0.165)	(0.020)	(0.168)	(0.133)	(0.487)	(0.314)
35-39	-0.082	0.131***	0.193	-0.244	0.816	-0.159
	(0.213)	(0.039)	(0.217)	(0.165)	(0.597)	(0.395)
40-44	-0.055	-0.100**	0.162	-0.271	1.193	-0.188
	(0.267)	(0.032)	(0.278)	(0.199)	(0.752)	(0.472)
45-49	0.084	0.033	0.290	-0.272	0.679	-0.078
	(0.329)	(0.020)	(0.336)	(0.250)	(0.953)	(0.599)
Wave (ref. = 2006)						
2012	0.114	0.004	-0.029	0.062	-0.413	-0.186
	(0.077)	(0.054)	(0.086)	(0.060)	(0.234)	(0.154)
2018	0.302*	0.112	0.177	0.338**	0.122	0.655*
	(0.143)	(0.097)	(0.157)	(0.108)	(0.429)	(0.274)
Number of persons	553	1,093	554	1,098	366	847
Person-years	1,289	2,606	1,291	2,616	876	2,057

Significance levels: *p < 0.05; **p < 0.01; ***p < 0.001. Based on individual-clustered standard errors (in parentheses).

Study 3

Does women's agency matter in the formation and realization of fertility desires? An empirical investigation in Egypt and Jordan

A slightly different version is published as BiB Working Paper:

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Introduction

As in many Middle Eastern and North African (MENA) countries, the gender regimes of Egypt and Jordan can be classified as neopatriarchal (Moghadam 2020), such that patriarchal family laws and norms are in place. Traditionally, the husband is expected to protect his wife and children and financially provide for them, while the wife is responsible for household and childrearing tasks and is expected to obey her husband (Moghadam 2004). In this context, most women are economically dependent on men and female labor market participation is low (Assaad et al. 2020). Based on this "patriarchal gender contract" (Moghadam 2004), childbearing and having a high number of children represents a social norm for women. Consequently, childlessness is rare in the MENA region (Rutstein and Shah 2004) and women typically have their first birth soon after marriage (Eltigani 2000; Gebel and Heyne 2014). Both marriage and motherhood are integral parts of a woman's life course, with marriage legitimizing sexual relationships (Rashad et al. 2005).

Women's empowerment is a concept that stands in contrast to such strict traditional gender role expectations, implying that women can pursue alternative life goals aside from being mothers and wives, which could lead to a lower desired number of children (Upadhyay et al. 2014). Kabeer (1999) defines empowerment as a process over time that includes resources, agency, and achievements; women acquire resources in this process, which enhances their agency, and in turn, their achievements. The key component "agency" refers to women's "capacity to define their own life-choices and to pursue their own goals, even in the face of opposition from others" (Kabeer 1999: 438), and according to Richardson (2018), is a direct indicator of empowerment. Following this definition, decision-making, freedom of movement, financial autonomy, and gender norms are commonly used as measures for agency (Richardson 2018; Thorpe et al. 2016). While the first three of these measures capture instrumental agency, gender norms capture intrinsic agency (Kabeer 1999).

In several MENA countries, fertility standstills or even increases in fertility (fertility stalls) have been observed during the transition from high to low fertility (Engelhardt et al. 2018; Krafft et al. 2021). An intriguing observation is that these fertility stalls occur toward the end of the fertility transition (Krafft et al. 2021) and not in the early phases of the transition, like in many sub-Saharan African countries (Schoumaker 2019). Egypt and Jordan are both interesting cases in this matter. While Egypt experienced a temporary increase in the total fertility rate (TFR) from 3.0 in 2008 to 3.5 in 2014 (Al Zalak and Goujon 2017; Ambrosetti et al. 2021), Jordan is the first MENA country where a long fertility stall (of around 3.8 children

per woman) ended, and since 2012, fertility decline has resumed (Cetorelli and Leone 2012; Krafft et al. 2021). In both Egypt and Jordan, the mean ideal number of children remains above three and the governments have pointed to population growth as one of the greatest challenges facing the country. Accordingly, they have both set a goal to reach replacement fertility, and women's empowerment is considered to be key to the success of population strategies (El-Saharty et al. 2022; Higher Population Council [Jordan] 2013).

Previous research in sub-Saharan African and South Asian countries shows that women with more instrumental agency desire fewer children than do women with less instrumental agency (reviewed in Upadhyay et al. 2014). For the MENA context, however, to my knowledge, only one study focusing on Egypt exists (Ambrosetti et al. 2021). Moreover, studies on the relationship between agency and unwanted fertility in the MENA region are completely lacking. However, such evidence is important as, at the aggregate level, both a reduction in fertility desires and a reduction in unwanted fertility are important for fertility decline (Bongaarts and Casterline 2018). Ambrosetti et al. (2021) found a positive association between Egyptian women's decision-making power (involvement in decisions about visits to family or relatives) and their personal ideal number of children.

My analyses extend the findings of Ambrosetti et al. (2021) by providing evidence on the association between women's agency and fertility desires in an additional MENA country—Jordan—the first country in this region where a fertility stall has recently ended, and by investigating whether agency positively affects women's ability to limit the number of children to their desired fertility. By definition, agency should enable women to pursue their own life goals; in this research, I examine if this is also the case regarding fertility desires. Moreover, I adopt a "couple's perspective" by examining whether the positive effect of agency on preventing unwanted births is also evident when the husband wants more children than his wife. All the analyses are based on data from the 2015 Egypt Health Issues Survey (EHIS) and the 2017–2018 Jordan Population and Family Health Survey (JPFHS), which are both part of the Demographic and Health Surveys (DHS) Program. I use Poisson regressions to estimate the association between agency and fertility desires, and linear probability models to estimate the association between agency and the ability to have no more children than desired.

The results of this study contribute to a better understanding of the relevance and role of women's empowerment for fertility desires and unwanted fertility in the MENA region. In light of governmental goals to reduce fertility, this knowledge could be important for developing effective family planning programs in Egypt and Jordan.

Actual, ideal, and unwanted fertility in Egypt and Jordan

The MENA region has experienced a sharp fertility decline in recent decades: the TFR for the region declined from 5.7 in 1980–1984 to 3.1 in 2002 (Tabutin et al. 2005). However, since this period, fertility stalls have been observed in several MENA countries, including Egypt and Jordan (Engelhardt et al. 2018; Krafft et al. 2021). Other countries that have experienced a fertility stall are Algeria, Iraq, Morocco, and Oman (Krafft et al. 2021). In Egypt, the TFR increased from 3.0 in 2008 to 3.5 in 2014 (Al Zalak and Goujon 2017; Ambrosetti et al. 2021), but by 2018 it had declined again, to 3.1 (Krafft et al. 2022). This trend differs from that of Jordan, the first MENA country, where a long fertility stall from the late 1990s to 2011 (of around 3.8 children per woman) ended, and since 2012, fertility decline has resumed (Cetorelli and Leone 2012; Krafft et al. 2021). According to the JPFHS, Jordan's TFR was 2.6 in 2017/2018 (Krafft et al. 2021). Interestingly, for Jordanian women, the personal mean ideal number of children is considerably higher: during the fertility stall period, it was around 4 and then fell to 3.8 in 2017 (Krafft et al. 2021). In Egypt, on the other hand, the observed TFRs are close to the mean personal ideal number of children, with the latter remaining stable at around 3 children between 1988 and 2014 (Al Zalak and Goujon 2017; Ambrosetti et al. 2019).

Miller and Pasta (Miller 2011; Miller and Pasta 1995) distinguish between fertility intentions and fertility desires. While fertility intentions do take personal circumstances or potential obstacles to childbearing into account, such as economic uncertainty (Berninger et al. 2011) or educational attainment (Krapf et al. 2023), fertility desires do not (Philipov and Bernardi 2011). Therefore, unlike fertility desires, fertility intentions are adapted to the personal situation over the course of life (Iacovou and Tavares 2011). Women and men can have intentions and desires regarding childbearing in the near future, the specific number of children, and the timing of having a child (Miller 2011; Miller and Pasta 1995). This paper focuses on child-number desires only, which differs from concrete child-number intentions. The sole focus on fertility desires is data-driven, since in the 2015 EHIS and the 2017–2018 JPFHS only child-number desires are surveyed. This was taken into consideration when interpreting the results of this study and will be further considered in the discussion.

This study focuses on the personal ideal number of children only, which differs from a societal ideal, which refers to fertility preferences at the normative level, i.e., the ideal number of children for a family in general (Testa 2012). "The personal ideal, when operationalised to refer to best conditions of life, measures fertility desires as defined in socio-psychological theories" (Philipov and Bernardi 2011: 496). The personal ideal number of children and the

desired number of children are, therefore, two expressions for the same concept. In the DHS Program, the personal ideal number of children is surveyed with the following question: "If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?" (Croft et al. 2018). This notion of "going back in time" is based on a problem referred to in the literature as ex post rationalization (Bongaarts 1990; Casterline and El-Zeini 2007), which means that women tend to adjust their reported ideal number of children upward to match their actual number of children. But even if this question is asked in relation to a time when the woman had no children, the problem remains—mothers cannot pretend that their children do not exist and their desired family size is still likely to be influenced by their realized fertility. This results in them wanting to avoid reporting a number that is lower than their actual number of children. This is a limitation that will be addressed in the analyses here and kept in mind when interpreting the results.

Although fertility desires may be subject to ex post rationalization (Bongaarts 1990; Casterline and El-Zeini 2007), they are an important indicator of fertility transition at the aggregate level. Scholars agree that "a decline in couples' desired family size is an essential precondition for the fertility transition to take place" (Bongaarts and Casterline 2018: 793). However, a woman's ideal number of children does not necessarily correspond to her realized fertility (ibid.). Bongaarts and Casterline (2018) showed that the average unwanted birth rate (total wanted fertility rate subtracted from TFR) per woman in 2014 in Egypt and 2012 in Jordan, respectively was 0.7 and 1.0. It is thus important that family planning policies in Egypt and Jordan target not only desired fertility but also unwanted fertility. However, the unwanted birth rate in Jordan is likely to be much lower today because of a sharp drop in the TFR from 3.8 in 2011 to 2.6 in 2018 (Cetorelli and Leone 2012; Krafft et al. 2021).

Women's agency and fertility

Population strategies in both countries consider women's empowerment to be key for slowing down population growth (El-Saharty et al. 2022; Higher Population Council [Jordan] 2013). After providing a more comprehensive definition of the concepts of "empowerment" and "agency", this chapter and Chapter 4 summarize empirical evidence on the relationship between women's agency—a direct indicator of women's empowerment (Richardson 2018)—and fertility desires and unwanted fertility. Due to a dearth of panel data on fertility desires or

intentions in high-fertility countries, the vast majority of the reported studies are based on cross-sectional data, which means that these results cannot be interpreted causally and the ex post rationalization problem remains.

This paper follows the definition of women's agency given by Kabeer (1999): women's "capacity to define their own life-choices and to pursue their own goals, even in the face of opposition from others" (p. 438). This is one of three components of women's empowerment, next to resources and achievements. Women's empowerment "refers to the expansion in people's ability to make strategic life choices in a context where this ability was previously denied to them" (Kabeer 1999: 437). Women's empowerment is described as a process over time whereby women acquire resources that enhance their agency, and in turn, their achievements (Kabeer 1999). Thus, agency is the component that links resources to achievements. Resources create conditions that can lead to greater agency and include not only material resources but also social resources (Kabeer 1999). Achievements are the realization of self-defined goals, e.g., labor market participation or health outcomes (Richardson 2018). While agency is a direct measure of empowerment, resources and achievements are only proxy measures of empowerment (Kishor 2000; Malhotra and Schuler 2005; Samman and Santos 2009, as cited in Richardson 2018). Richardson (2018) recommends that researchers use direct indicators of empowerment (i.e., agency) since the causal direction of many indirect measures (e.g., education, employment, or health) is unclear; indirect measures can be resources for agency, achievements of the empowerment process, or even both. Moreover, resources do not necessarily translate into agency (Kabeer 1999; Malhotra and Schuler 2005). Some scholars distinguish between instrumental agency (the ability to act) and intrinsic qualities of agency, such as gender role attitudes (e.g., Samari 2019b).

This study focuses only on instrumental agency, measured by decision-making. Participation in decision-making is the most commonly used measure for agency in quantitative studies on empowerment in low- and middle-income countries (Donald et al. 2017, Kabeer 1999, Richardson 2018). Its use is based on the idea that the more decisions a woman is involved in, the more control she has over her own life (Kishor 2000). Besides decision-making, further dimensions of agency have been identified and most authors agree that it is a multidimensional construct (Agarwala and Lynch 2006; Mason 1986; Richardson 2018; Yount et al. 2016). Other dimensions that are often used to capture women's agency are freedom of movement and access to/control over financial resources (Carlson et al. 2015; James-Hawkins et al. 2016; Prata et al. 2017; Pratley 2016; Thorpe et al. 2016; Upadhyay et al. 2014). Empirical evidence supports the

idea that women can have agency in one dimension, while not having agency in other dimensions (Samman and Santos 2009).

Many empirical studies from the fields of sociology, demography, anthropology, and economics have aimed to analyze the effect of women's agency on fertility (reviewed in Upadhyay et al. 2014, and more recent studies, e.g., Ambrosetti et al. 2021; Haque et al. 2021). The vast majority of these studies have found positive associations between women's instrumental agency and lower fertility (number of births and fertility desires). However, only a few studies have been conducted in the MENA region, and these have focused only on Egypt (Ambrosetti et al. 2021; Samari 2017b). Samari (2017b) analyzed realized fertility and surprisingly found that women with greater instrumental agency (participation in household decision-making, financial autonomy, and freedom of movement) tend to have more children than women with less instrumental agency. This finding is not in line with evidence from South Asia or sub-Saharan Africa, which suggests that women with high agency in these regions have fewer children than women with low agency (e.g., Gudbrandsen 2013; Hindin 2000; Khan and Raeside 1997). Samari (2017b) argues that married Egyptian women with high agency might want to have more children because "women with more agency could be opting to have more children as a means of social and household gains" (p. 575). However, this could also apply to women with less agency and does not explain differences in fertility intentions by level of agency.

To my knowledge, there is no empirical evidence in the MENA context on the relationship between agency and concrete fertility intentions. Ambrosetti et al. (2021) studied fertility desires with data from the 2015 EHIS and found no positive association with women's level of agency, measured by decision-making power. Instead, they found a strong and negative association between married women's agency and their ideal number of children. Another explanation for the positive relationship between the number of children and agency, as found by Samari (2017b), could be reverse causality. Some previous studies indicate that motherhood or subsequent births might positively affect women's agency in the MENA region (Friedrich et al. 2021; Friedrich 2023; Samari 2017a).

The role of agency and husband's fertility desires in women's ability to limit their number of children

A small number of studies have examined the role of agency in women's ability to achieve their desired number of children (sub-Saharan Africa: Atake and Ali 2019; Upadhyay and Karasek 2012; 53 low- and middle-income countries: Haque et al. 2021). These studies have consistently found positive associations between women's involvement in decision-making and their ability to limit the number of children to their desired fertility. They did not test specific mechanisms that might mediate this relationship, but according to the understanding of agency as the ability to recognize and act on one's own goals, it is assumed that women with greater agency are able to identify their desired number of children and take action to achieve it (e.g., adopting effective birth control). However, to my knowledge, there is no specific evidence for the MENA region.

Previous research in developing countries has shown that if the husband's ideal number of children is higher than the wife's fertility desires, the females are more likely to have more children than they desire (Haque et al. 2021; Upadhyay and Karasek 2012), which indicates that the husband's fertility desires, although they are not concrete intentions, somehow play a role in what fertility decisions are finally made, and thus, in a woman's ability to have no more children than her desired number. One reason for this could be that husbands have the final voice on contraceptive use, which has been suggested by findings in sub-Saharan Africa and South Asia on husband's and wife's intentions to have more child(ren). Indeed, research suggests that the use of contraception is lower if the husband wants more children than the wife (Mason and Smith 2000; Speizer and Calhoun 2022) and higher if only the husband wants to stop childbearing (Dodoo 1998; Tilahun et al. 2014; Wolff et al. 2000).

These results indicate that a strong patriarchal context enhances the husband's control over the use of contraception. However, findings for the MENA region on the relationship between fertility intentions and contraceptive use are different. Bankole and Singh (1998) and Takruri (2012) showed that Moroccan and Egyptian couples who disagree in their intention to have more children are more likely to use modern contraceptives when only the wife wants no more children compared to when only the husband wants no more. The reason for this remains unclear. However, being involved in decisions regarding the use of family planning methods does not necessarily mean the wife has control over having another child. Takruri (2012) also found that for subsequent childbearing, in Egypt, the husband's fertility intentions are more

important than the wife's fertility intentions, so the final decision on having another child seems to still be made by the husband.

While the importance of the husbands' fertility desires and intentions for fertility outcomes has become increasingly clear, as indicated by the results of the aforementioned studies, it has yet to be empirically tested whether the relationship between a woman's instrumental agency and the achievement of their fertility desires varies with the husband's fertility desires. It also remains unclear whether a woman with agency is indeed able to have no more children as she desires when her husband wishes to have more children.

Theory and hypotheses

From a theoretical perspective, women's agency implies that women have choices—including regarding fertility decisions—and that they are able to pursue them, even in the face of reluctance from others (Kabeer 1999). This stands in contrast to strict traditional gender roles in a strong patriarchal context, according to which, women should obey their husbands and are restricted to the private sphere, to being mothers and wives. By definition, agency enables women to overcome such gender role expectations and dependency on their husbands. Therefore, women with agency should have ideas of being able to pursue and perform alternative life goals and roles aside from being mothers and wives and bearing a high number of children. They should feel that they have control over fertility decisions and are able to formulate and voice their wish to bear a certain number of children, which may deviate from the societal norm. This likely also implies that women with high agency do not accept the idea that women have to bear a large number of children at the expense of their health and well-being. According to the Traits-Desires-Intentions-Behavior (TDIB) theoretical framework (Miller 2011; Miller and Pasta 1995), such beliefs and attitudes influence the formation of desires about the number of children an individual wishes to have. Following this framework, I expect women with high instrumental agency to desire to have a lower number of children than women with low instrumental agency.

> H1: Women's instrumental agency negatively affects women's desired number of children.

I not only expect that women in the MENA region with higher instrumental agency are more likely to have, on average, a lower personal ideal number of children than women with lower instrumental agency, but also that they are more able to translate their fertility desires

into fertility outcomes; more specifically, they are less likely to have unwanted births. Desired fertility, rather than the intended number of children, is a better indicator of whether a woman's actual number of children is wanted (Miller 2011; Philipov and Bernardi 2011). This is because child-number intentions reflect (downward) adjustments and compromises of the true reproductive goal, which thus, is the total number of wanted children due to specific circumstances (ibid.). A birth still can be "unwanted" with respect to current or previous circumstances, but the focus of this study is on comparing a woman's true desired number of children and their actual number of children near the end of their reproductive time.

According to the traits-desire-intentions sequence, child-number desires are translated into concrete fertility intentions: "desires […] are psychologically intermediate between motivations, attitudes, and beliefs on the one hand and intentions on the other" (Miller and Pasta 1995: 531). Desires are wishes of an individual that do not directly lead to action, but that first have to be translated into intentions, which are conscious commitments to act (ibid.). Again, agency implies that women are able to pursue self-defined goals (Kabeer 1999). Women with higher instrumental agency (e.g., with a higher degree of participation in household and individual decisions) are therefore expected to be more capable of achieving their intended family size by having more control over having children than women with lower instrumental agency. This could include that women with agency are more able and unafraid of talking to their husbands about contraceptive use and their own fertility desires. They may also have better access to and knowledge about contraceptives. Since, according to the TDIB framework, the intended family size is normally lower than the desired family size, women with agency are less likely to have more children than their desired number of children. However, there is one situation where child-number intentions could be higher than child-number desires: intentions take the perceived desires of significant others into account (Miller and Pasta 1995). Thus, a woman's child-number intention can be higher than her child-number desires if her husband or family and friends have a higher desired number of children than she does. However, since agency also means that someone is able to pursue their goals "even in the face of opposition from others" (Kabeer 1999: 438), women with high instrumental agency should be less likely to adapt their intentions to the desires of others. Therefore, overall, I expect that women with high agency are better able to limit their fertility to their desired number of children than women with less agency.

H2: Women's instrumental agency positively affects women's ability to have no more children than their personal ideal number of children.

If a woman with high agency in a strong patriarchal context is indeed able to have no more children as she desires, even if her husband wishes to have more children than she does, this still needs to be tested empirically. As stated above, previous studies have not examined whether the husband's fertility desires or intentions change the relationship between women's agency and fertility. According to the concept of agency, women with high agency are able to make decisions even against the reluctance of others, including their husbands. A woman with high agency should be able to prevent unwanted births and it should make no difference if her husband has a higher ideal family size than she does.

> H3: The positive effect of women's instrumental agency on women's ability to have no more children than their personal ideal number of children is the same for women who have a lower desired number of children than their husband as for women who have the same or a higher desired number of children than their husband.

Method

Data and sample

I used data from the 2017–2018 JPFHS (Department of Statistics [DOS] and ICF 2019) and the 2015 EHIS (Ministry of Health and Population [Egypt] et al. 2015b), which are both part of the DHS Program. Both surveys are nationally representative household surveys that provide population and health data, including on women's agency and ideal number of children. The JPFHS and EHIS were the first Demographic and Health Surveys in Egypt and Jordan to ask both males and females about fertility and fertility desires. The adult questionnaire of the 2015 EHIS targets eligible individuals aged 15–59 years, but information on women's fertility desires and decision-making power was collected only for women aged 15–49 (n=7,906). In the 2017–2018 JPFHS, ever-married women aged 15–49 were eligible for an interview (n=14,689). For the analyses, I constructed three subsamples for both countries:

(1) For the analysis of women's fertility desires, I restricted the analytic sample to currently married women aged 15–49 with children (Egypt: n=5,190, Jordan: n=12,197).

(2) For the analysis of the ability to achieve fertility goals, the analytic sample was restricted to currently married women aged 35–49 with children (Egypt: n=2,199, Jordan: n=6,345). I chose the lower age limit of 35 because, in Egypt and Jordan, childbearing is concentrated among women aged 20–34 years (see final reports of the Egypt Demographic and

Health Survey [EDHS] 2014 and JPFHS 2017–2018: Department of Statistics [DOS] and ICF 2019: 75f. and 81; Ministry of Health and Population [Egypt] et al. 2015a: 40f.). This age limit has already been used in previous studies on the effect of agency on women's ability to limit the number of children to their ideal (Atake and Ali 2019; Haque et al. 2021; Upadhyay and Karasek 2012).

(3) For the analysis using the moderator "lower fertility desires than husband," I had to restrict the analytic sample to currently married women aged 35–49 with children for whom information on their husband's ideal number of children was available (Egypt: n =956, Jordan: n=1,336). For Jordan, this was possible with a couple recode dataset, which was provided by JPFHS 2017–2018. For the 2015 EHIS individual dataset, I identified married couples by the line number indicating the relationship to the household head (i.e. wife or husband). However, unfortunately, it was not possible to identify the spouse of a woman who was married but not to the head of the household.

The restriction of all three analytical samples to married women with children was made for the following reasons. As already mentioned above, childless women are likely to differ in their fertility desires from women with children; this is because their ideal number of children is likely to be affected by their realized fertility and experiences as a mother. Therefore, the focus was only on women with children. The samples were additionally restricted to married women since motherhood outside marriage is rare in the MENA context and may be associated with unusual circumstances.

Eventually, after excluding cases because of missing values on agency, fertility desires, or any of the further variables needed in the analysis, the final analytic samples included the following number of cases: (1) Currently married women aged 15–49 with children: 5,090 (Egypt) and 12,054 (Jordan); (2) Currently married women aged 35–49 with children: 2,144 (Egypt) and 6,261 (Jordan); (3) Currently married women aged 35-49 with children with information on husband's fertility desires: 955 (Egypt) and 1,336 (Jordan).

Fertility desires were measured by the respondent's stated ideal number of children. In the EHIS 2015, married respondents, irrespective of whether or not they had living children, 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?" In the JPFHS 2017–2018, respondents with children were asked: "If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?" In both surveys, some respondents provided non-numeric responses, e.g.,

"as god wills," but the prevalence of these responses was rare (EHIS 2015, women: 1.4%, men: 1.6%; JPFHS 2017–2018, women: 1.1%, men: 0.3%) (Department of Statistics [DOS] and ICF 2019; Ministry of Health and Population [Egypt] et al. 2015b). I coded these few non-numeric responses as missing.

Women's ability to limit the number of children to their ideal was measured by comparing a woman's fertility desires and her actual number of children. I subtracted a woman's ideal number of children from her number of living children and created a binary variable: the woman is *able* to limit her number of children to her ideal (i.e., the woman's ideal number of children is higher or the same as her actual number of living children = 1) vs. the woman is *not able* to limit her number of children to her ideal (i.e., the woman's ideal number of children is lower than her actual number of children = 0).

Women's instrumental agency was measured by a woman's involvement in decision-making. This dimension of agency has been used in the majority of studies on the relationship between women's agency and fertility (Upadhyay et al. 2014) and has been empirically validated in the Egyptian context (Cheong et al. 2017; Salem et al. 2020; Yount et al. 2016). In the EHIS 2015 and JPFHS 2017–2018, the respondents were asked the following three questions: "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?" The response options for each question were: husband alone, someone else, respondent jointly with husband, respondent alone. I coded each decision as a binary variable indicating whether the woman was involved in this decision (i.e., she decides jointly with her husband or alone = 1) or not (i.e., someone else or her husband decides alone = 0). Based on these three binary variables, I additionally created a count variable that indicated the number of decisions in which the woman is involved (range: 0–3).

The moderator *lower fertility desires than husband* was a dichotomous variable that indicated whether the wife had a higher or the same ideal number of children than/as her husband (= 0) vs. a lower ideal number of children than her husband (= 1).

Analytic strategy

To assess the association between women's instrumental agency and women's fertility desires, Poisson regression models were estimated, because the outcome variable is a discrete count (women's ideal number of children). Linear probability models were estimated to analyze the

association between women's instrumental agency and women's ability to have no more children than their ideal. Using the linear probability model for binary dependent variables is recommended by several scholars (e.g., Angrist and Pischke 2010; Breen et al. 2018; Mood 2010) because it offers a clear interpretation of the coefficients as a set of average discrete changes in the probability of the outcomes (Wooldridge 2010). This is much easier to interpret than odds ratios or logit coefficients. Moreover, the linear probability model allows the coefficients across models and between groups to be compared (Mood 2010, Wooldridge 2010). To test whether the association was weaker if the wife's ideal number of children was lower than that of her husband, interaction terms between women's decision-making power and the husbands' fertility desires were included in the models.

To account for confounding bias, all the models controlled only for the variables expected to have an effect on both the outcome (fertility desires or ability to achieve fertility goals) and women's decision-making power. To avoid overcontrol and endogenous selection bias, I did not control for variables that are seen to be a consequence of women's agency and the respective outcome (Elwert and Winship 2014; Kohler et al. 2023). The control variables in all the models were age, educational attainment (low: no education and incomplete primary; medium: complete primary and incomplete secondary; high: complete secondary and higher), currently employed, household wealth quintile (measured by a composite wealth index, which is available in the original datasets), region of residence (Egypt: Urban Governorates, Lower Egypt, Upper Egypt, Frontier Governorates; Jordan: North, Central, South), and rural or urban residence. For Egypt, the models additionally controlled for religion (Muslim vs. other religion). Unfortunately, the JPFHS 2017–2018 provides no information on the religion of the respondents. Because stated fertility desires are at risk of ex post rationalization (Bongaarts 1990; Casterline and El-Zeini 2007) and there is a possibility that the actual number of children influences women's agency (Friedrich 2023; Samari 2017a), the number of living children was included as a further control in the models that analyzed the association between women's fertility desires and women's instrumental agency. Moreover, as a sensitivity analysis, I estimated those models without the covariate currently employed. The main results of the models were similar and are presented in the Appendix Table A4. I conducted this sensitivity analysis because being employed could mediate the effect of agency on fertility desires and if so, its inclusion in the models would lead to overcontrol bias.

Results

Descriptive results

The descriptive statistics for all three analytic samples are presented in Table 1. The mean ideal number of children among married women aged 15–49 with children (Sample 1) is 3.3 for Egypt and 4.0 for Jordan. Among married women aged 35–49 with children (Sample 2), the mean ideal number of children is around 0.3 higher, and more than half have no more children than their reported ideal number of children (66% in Egypt and 62% in Jordan). This indicates that around one-third of women are unable to limit their fertility to their desired number of children; i.e., they have at least one unwanted birth. Because of "rationalization bias," this share is probably even higher.

The two upper graphs in Figure 1 show the mean ideal number of children for all the wives and their husbands based on Sample 3, which includes married women aged 35–49 with children, for whom information on the husband's ideal number of children is available. In Egypt, the husbands' mean ideal number of children (3.97) is higher than the wives' (3.50). In Jordan, there is only a very slight difference between husbands and wives: 4.31 and 4.27, respectively. The two lower graphs in Figure 1 show how the ideal number of children differs at the couple level, which also demonstrates country-level differences. In Egypt, many spouses share the same fertility desires (44%) or the wife has a lower fertility desire than the husband (35%), whereas in Jordan, only 24% agree on the ideal number of children. In Jordan, the majority of wives (41%) have a lower ideal number of children than their husbands. However, the proportion of Jordanian women who reported higher fertility desires than their husbands is also high (36%). In Egypt, the proportion is only 22%.

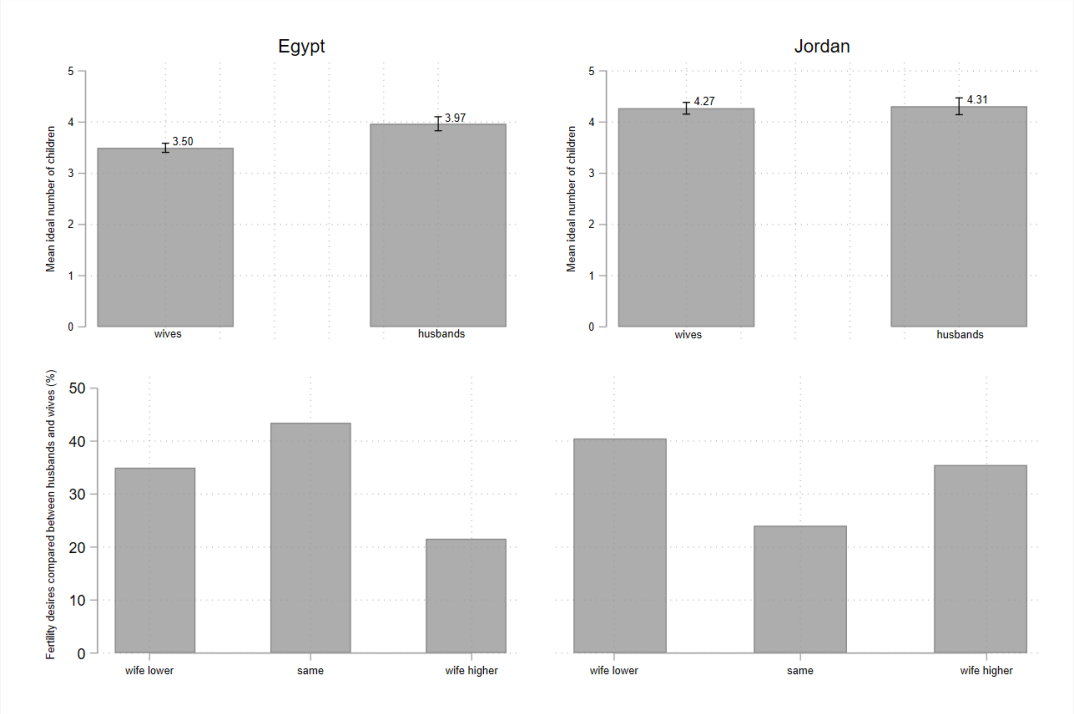
The following descriptive results on women's agency refer to married women aged 15–49 with children only (Sample 1). The majority of women are involved in decisions about major household purchases, visits to family or relatives, and their own healthcare. Women's involvement in decision-making is lower in Egypt than in Jordan. On average, women in Egypt and Jordan are involved in 2.4 and 2.6 decisions (out of three), respectively. Comparing all three decisions separately, the proportion of women involved is lowest for decisions about major household purchases: 75% in Egypt and 81% in Jordan. The percentages are 79% (Egypt) and 88% (Jordan) for decisions about visits to family and relatives, and 87% (Egypt) and 91% (Jordan) for decisions about their own health care.

Table 1: Descriptive statistics (proportions or means (standard deviations in parentheses)). EHIS 2015 and JPFHS 2017–2018.

	Sample 1[1]		Sample 2[2]		Sample 3[3]	
	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan
Ideal number of children	3.301 (1.396)	4.031 (1.877)	3.585 (1.589)	4.240 (2.066)	3.497 (1.412)	4.270 (2.132)
Has no more children than ideal	.785	.735	.664	.618	.682	.613
Wife has a lower ideal number of children than husband	-	-	-	-	.350	.405
Main predictor						
Involvement in decision-making						
Count	2.404 (0.951)	2.600 (0.824)	2.446 (0.922)	2.617 (0.805)	2.447 (0.891)	2.603 (0.817)
Major household purchases	.745	.808	.765	.812	.763	.803
Visits to family or relatives	.787	.882	.801	.891	.792	.888
Health care	.872	.907	.880	.913	.892	.912
Controls						
Age	33.228 (7.954)	35.149 (8.089)	41.135 (4.322)	41.752 (4.343)	39.395 (3.505)	41.696 (4.298)
Number of living children	2.904 (1.403)	3.594 (1.905)	3.667 (1.431)	4.528 (1.878)	3.562 (1.323)	4.626 (1.876)
Educational attainment						
Low	26.916	7.035	37.127	8.896	32.356	8.757
Medium	18.939	44.740	17.724	46.606	17.382	46.931
High	54.145	48.225	45.149	44.498	50.262	44.311
Currently employed	.142	.131	.191	.146	.199	.161
Wealth quintile						
Lowest	20.079	29.036	22.062	25.044	20.419	21.407
Second	17.898	24.838	17.537	22.712	17.173	23.503
Middle	16.483	21.246	12.920	21.019	13.508	21.257
Fourth	20.825	15.638	19.963	18.160	21.990	19.162
Highest	24.715	9.242	27.519	13.065	26.911	14.671
Muslim	.948	-	.941	-	.943	-
Urban	.450	.797	.501	.793	.507	.784
Region						
Egypt						
Urban Governorates	16.483	-	18.563	-	18.848	-
Lower Egypt	38.173	-	39.599	-	40.000	-
Upper Egypt	38.939	-	35.354	-	32.775	-
Frontier Governorates	6.405	-	6.483	-	8.377	-
Jordan						
North	-	35.797	-	34.915	-	35.180
Central	-	35.026	-	36.128	-	35.105
South	-	29.177	-	28.957	-	29.716
Number of cases	5,090	12,054	2,144	6,261	955	1,336

Notes: [1]currently married women with children aged 15-49, [2]currently married women with children aged 35-49, [3]currently married women with children aged 35-49 with information on husband's fertility desires.

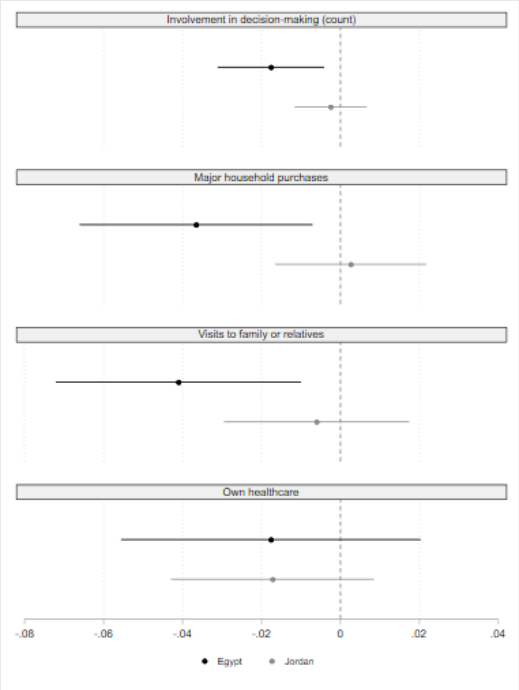
Figure 1: Fertility desires of currently married women with children aged 35-49 with information on husband's fertility desires (Sample 3; Egypt: n = 955, Jordan: n= 1,336).



Multivariate analysis results

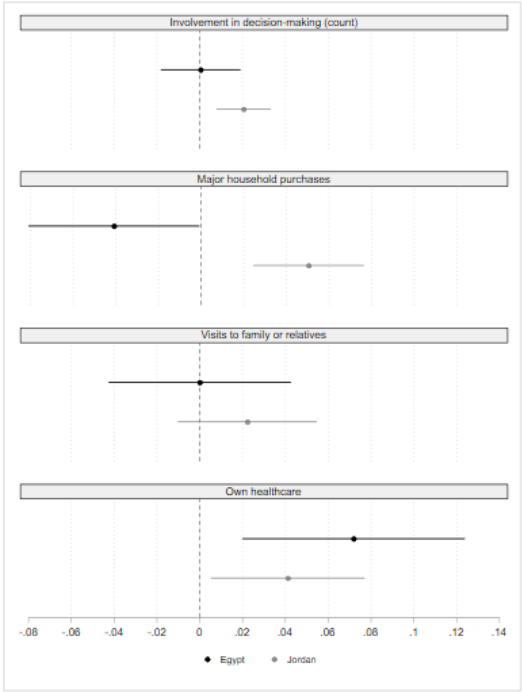
Figure 2 shows the results of the Poisson regression models, which estimated the association between women's involvement in decision-making and fertility desires. Poisson regression coefficients can be interpreted as changes in the logs of the expected counts and thus exp(b) can be interpreted in terms of percent changes. In both countries, Egypt and Jordan, I find a negative association between decision-making power and a higher ideal number of children. However, only Egypt shows statistically significant associations; therefore, hypothesis H1 ("Women's instrumental agency negatively affects women's desired number of children") is only supported in the context of Egypt. For Egyptian women, if the number of decisions they are involved in increases by one decision, the desired number of children decreases by 2% (exp(-0.02)-1, 90% confidence interval (CI) [-0.03, -0.004]). Looking at the three decision items separately, in Egypt, the association is only statistically significant for two decisions: being involved in decisions about major household purchases and about visits decreases the ideal number of children by 4% (exp(-0.04)-1, 90% CI [-0.07, -0.01]).

Figure 2: Coefficient estimates of involvement in decision-making (Poisson regression models, dependent variable: ideal number of children). Currently married women with children aged 15-49 (Egypt: n = 5,090, Jordan: n= 12,054).



Notes: 90% confidence intervals are displayed. All models controlled for age, education, currently employed, household wealth quintile, living children, region, urban. For Egypt, the models additionally control for religion. Full models are presented in Table A1.

Figure 3: Coefficient estimates of involvement in decision-making (linear probability models, dependent variable: ability to limit the number of children to ideal). Currently married women with children aged 35-49 (Egypt: n = 2,144, Jordan: n= 6,261).



Notes: 90% confidence intervals are displayed. All models controlled for age, education, currently employed, household wealth quintile, region, urban. For Egypt, the models additionally control for religion. Full models are presented in Table A2.

The results of the linear probability models, which tested the association between women's decision-making power and their ability to limit fertility to their ideal number of children, are presented in Figure 3. For the number of decisions a woman is involved in, only Jordan shows a positive, statistically significant association with having no unwanted births. If the number of decisions a woman in Jordan is involved in increases by one decision, the probability of having unwanted birth(s) decreases by 2% (90% CI [0.01, 0.03]).

In both countries, however, having some say in healthcare decisions seems to be relevant for women's ability to realize their fertility desires. In Egypt, being involved in these decisions increases the probability of achieving fertility desires by 7% (90% CI [0.02, 0.12]). The results for Jordan also show a positive but smaller association (4%, 90% CI [0.01, 0.08]).

In Jordan, being involved in decisions about major household purchases is positively associated with women's ability to achieve their desired fertility; having some say about major

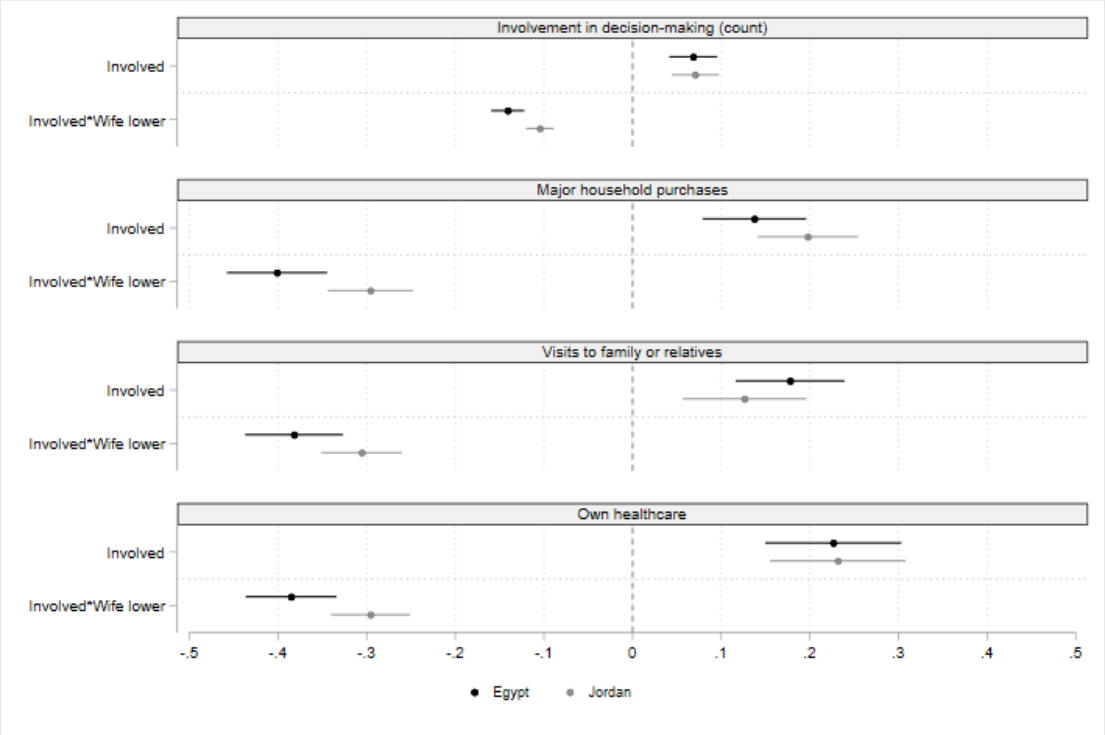
household purchases increases the probability of Jordanian women having no more children than the desired number by 5% (90% CI [0.02, 0.08]). Surprisingly, in Egypt, the association between being involved in decisions about major household purchases and having unwanted birth(s) is negative; being involved in such decisions decreases the probability of Egyptian women having no unwanted births by 4% (90% CI [-0.08, -0.001]). However, the p-value is 0.094; therefore, the association is only statistically significant at the 10% level. For decision-making power about visits to family or relatives, the results for Egypt show no association, while for Jordan, there is a small positive, but not statistically significant association. In sum, for Jordan and Egypt, the results support hypothesis H2 ("Women's instrumental agency positively affects women's ability to have no more children than their personal ideal number of children") only regarding wives' involvement in decisions about their own health care.

Figure 4 presents the results of the linear probability models, which estimated how the association between women's decision-making power and their ability to have no more children than their desired fertility differs by the fertility desires concordance between spouses. All the models included the interaction terms for women's involvement in decision-making and the moderator "lower fertility desires than husband" (wife has a higher or the same ideal number of children as her husband [= 0] vs. wife has a lower ideal number of children than her husband [= 1]). The results are similar for both countries. I find a positive association between having a say in decisions and the ability to have no more children than desired only for women who had the same or a higher ideal number of children than their husbands. All the associations are strong and statistically significant. For example, for women who do not have lower fertility desires than their husbands, being involved in decisions about their own healthcare increases the probability of having no more children than their ideal number of children by around 23% in Egypt and Jordan (90% CIs, [0.15, 0.30] and [0.16, 0.31], respectively).

Surprisingly, I find a negative association between having decision-making power and the ability to realize fertility desires for women who have a lower ideal number of children than their husbands. For instance, for women who have lower fertility desires than their husbands, having a say in decisions about their own healthcare decreases the probability of having no more children than their ideal number of children by 16% (-0.39 + (1*0.23)) and 7% (-0.30 + (1*0.23)) for Egypt and Jordan, respectively. These results do not confirm hypothesis H3 ("The positive effect of women's instrumental agency on women's ability to have no more children than their personal ideal number of children is the same for women who have a lower desired

number of children than their husband as for women who have the same or a higher desired number of children than their husband").

Figure 4: Coefficient estimates of involvement in decision-making for women who have the same or a higher desired number of children than their husband and of the interaction term between involvement in decision-making and the wife has a lower desired number of children (linear probability models, dependent variable: ability to limit the number of children to ideal). Currently married women with children aged 35-49 with information on husband's fertility desires (Egypt: n = 955, Jordan: n= 1,336).



Notes: 90% confidence intervals are displayed. All models controlled for age, education, currently employed, household wealth quintile, region, urban. For Egypt, the models additionally control for religion. Full models are presented in Table A3.

Discussion and conclusion

This study examined how women's agency, specifically decision-making power, is associated with their ideal number of children and their ability to limit their fertility in Egypt and Jordan. On the aggregate level, both a reduction in fertility desires and unwanted fertility are important for fertility decline (Bongaarts and Casterline 2018), which is a goal set by the governments of the two countries. Adopting a couple's perspective, the analyses also showed how the relationship between agency and preventing unwanted births varies by the agreement about fertility desires between spouses.

In line with the findings of Ambrosetti et al. (2021), the results suggest that married Egyptian women with higher decision-making power have a lower ideal number of children. While Ambrosetti et al. (2021) found this negative relationship only for the decision about visits to family and relatives, the results of this study also showed a negative association regarding the involvement in decisions about large household purchases. There were no statistically significant associations between agency and fertility desires in Jordan. However, the results indicate that women in Jordan with more decision-making power are better able to limit their fertility to their ideal number of children than women with lower involvement in decision-making. Furthermore, in both countries, wives' having a say in their own health care seems to be important for avoiding unwanted births. These results corroborate previous findings from other regions, which also show a positive relationship between women's empowerment and their ability to limit their fertility (Atake and Ali 2019; Haque et al. 2021; Upadhyay and Karasek 2012). However, these studies did not present the results separately for the different decision-making domains; therefore, it is not possible to verify whether they also found a significant association for involvement in healthcare decisions. A woman who is free to decide about her medical treatment may have better access to and knowledge about contraceptives and might be aware of the health benefits of spacing births. When decisions about women's health care are made jointly by husband and wife, this could also mean that the spouses discuss openly their contraceptive use, and alongside this, their fertility desires, which could lead to the alignment and concordance of spouses' family planning and fertility desires.

Further analyses showed that in both countries, women's agency is positively associated with women's ability to limit their fertility *only* when husband and wife agree on the ideal number of children, or when the wife has a higher ideal number of children than her husband. This result suggests that in the patriarchal context of the MENA region, it is eventually the husband who decides about realized fertility if he has a higher ideal number of children than his wife, and that the wife's agency does not matter in this case. Thus, the positive effect of a woman's agency on her bargaining power and spousal communication seems to be very weak or nonexistent when her husband wants more children than she does, indicating the presence of strong patriarchal social structures. Women who have the same or higher fertility desires than their husbands do not have to argue about not having more children than their ideal number of children. Therefore, the positive impact of agency on preventing unwanted births among these women is probably not due to their higher bargaining power, but rather to better access to and knowledge about contraceptives and a preference for spacing births. The results also showed that the wife's decision-making power was even negatively associated with avoiding unwanted

births when the husband was the one with the higher fertility desires. This negative association is puzzling and should be investigated in future research. One explanation—at least for Egypt—could be that women with higher agency prefer a lower number of children, therefore the gap to the husband's fertility desires could be larger than for women with lower agency, who are likely to have a higher ideal number of children. Strong disagreement between husband and wife about the ideal number of children could make it more difficult for women to fulfill their fertility desires.

This study has some limitations. First, although the results give valuable insights into the possible mechanisms behind the relationship between agency and fertility desires and unwanted births, it was beyond the scope of this study to test such mechanisms.

Second, this study could not draw conclusions on the effect of agency on concrete fertility intentions, as only desired fertility could be analyzed. This also implies that "having unwanted birth(s)" refers only to the ideal number of children, and thus, the results do not provide insight into the effect of agency on births that might be unwanted due to specific circumstances, e.g., financial shortages.

Third, another limitation of this study refers to the measurement of desired fertility. Due to the problem of ex post rationalization (Bongaarts 1990; Casterline and El-Zeini 2007)—which in this context means that women tend to adjust their reported ideal number of children upward to match their actual number of children—the negative association between agency and ideal number of children might have been underestimated and the positive association between agency and the ability to limit fertility might have been overestimated. The question-wording in the DHS attempts to address this issue by asking about the ideal number of children if the woman could go back to the time when she had no children (The DHS Program 2020). However, this cannot be expected to have resolved the problem completely.

Fourth, as in previous studies, due to the lack of panel data, it was not possible to determine a causal relationship and this study could not compare young, childless women's desired number of children to their realized number of children at the end of their reproductive lifespan. The reported desired fertility at the time of the interview could already have been changed over the life course; e.g., women might have adjusted their ideal number of children downwards at the end of their reproductive lifespan if they perceived that their initial ideals were unlikely to be fulfilled (Gray et al. 2013). Repeated observations of the fertility intentions of the same individuals over time would also make it possible to compare the realization of past short-term fertility intentions (e.g., the intention not to have a child in the next three years)

between women with high and low agency, and unwanted fertility could be estimated more precisely since ex post realization could lead to an underestimation of unwanted births. Large-scale panel surveys that include questions about women's agency and fertility would therefore be of great importance and would open up new possibilities for future research.

Finally, it should be noted that the sample size for the analyses on fertility outcomes was substantially reduced because the sample had to be restricted to women for whom information on their husband's fertility desires was available. Despite this sample reduction, however, the inclusion of both spouses' fertility desires in the analyses provided valuable insights. In general, more research and data at the couple level is necessary to include husband characteristics in the analysis. For example, it would be important to explore whether women with agency have husbands with less traditional gender role attitudes, and thus, it may not be only the wives' agency but also their husband's attitudes that enable them to limit their fertility.

The findings of this study suggest that promoting women's empowerment is important to reduce fertility desires and unwanted births in the MENA region. In particular, fostering women's decision-making power over their own health care seems to be essential for them to avoid having more children than they want. However, for Jordan, no negative association between agency and ideal number of children was found, and the reasons for this should be investigated in future studies. The results of the analyses that considered husbands' fertility desires highlight the need for family planning programs to also target men, since the results indicate that women with high agency are unable to limit their fertility to their desired number of children if their husbands want more children than they do. In a patriarchal society, where it is eventually the husband who decides on the number of children, a fertility decline is only possible if both men's and women's fertility desires decline. Men also need to be educated about contraception and reproductive health so that women do not have to give birth at the expense of their well-being.

References

Agarwala, R., and Lynch, S. M. (2006). Refining the measurement of women's autonomy: An international application of a multi- dimensional construct. *Social Forces*, *84*(4), 2077–2098. https://doi.org/10.1353/sof.2006.0079

Al Zalak, Z., and Goujon, A. (2017). Exploring the fertility trend in Egypt. *Demographic Research*, *37*(1), 995–1030. https://doi.org/10.4054/DemRes.2017.37.32

Ambrosetti, E., Angeli, A., and Novelli, M. (2019). Ideal family size and fertility in Egypt: An overview of recent trends. *Statistica*, *79*(2), 223–244. https://doi.org/10.6092/issn.1973-2201/8811

Ambrosetti, E., Angeli, A., and Novelli, M. (2021). Childbearing intentions among Egyptian men and women: The role of gender-equitable attitudes and women's empowerment. *Demographic Research*, *44*(51), 1229–1270. https://doi.org/10.4054/DemRes.2021.44.51

Angrist, J. D., and Pischke, J.-S. (2010). The credibility revolution in empirical economics: How better research design is taking the con out of econometrics. *Journal of Economic Perspectives*, *24*(2), 3–30. https://doi.org/10.1257/jep.24.2.3

Assaad, R., Hendy, R., Lassassi, M., and Yassin, S. (2020). Explaining the MENA paradox: Rising educational attainment yet stagnant female labor force participation. *Demographic Research*, *43*(28), 817–850. https://doi.org/10.4054/DemRes.2020.43.28

Atake, E.-H., and Ali, G. P. (2019). Women's empowerment and fertility preferences in high fertility countries in Sub-Saharan Africa. *BMC Women's Health*, *19*(54), 1–14. https://doi.org/10.1186/s12905-019-0747-9

Bankole, A., and Singh, S. (1998). Couples' fertility and contraceptive decision-making in developing countries: Hearing the man's voice. *International Family Planning Perspectives*, *24*(1), 15–24. https://doi.org/10.2307/2991915

Berninger, I., Weiß, B., and Wagner, M. (2011). On the links between employment, partnership quality, and the intention to have a first child: The case of West Germany. *Demographic* Research, 24(24), 579–610. https://doi.org/10.4054/DemRes.2011.24.24

Bongaarts, J. (1990). The measurement of wanted fertility. *Population and Development Review*, *16*(3), 487–506. https://doi.org/10.2307/1972833

Bongaarts, J., and Casterline, J. B. (2018). From fertility preferences to reproductive outcomes in the developing world. *Population and Development Review*, *44*(4), 793–809. https://doi.org/10.1111/padr.12197

Breen, R., Karlson, K. B., and Holm, A. (2018). Interpreting and understanding logits, probits, and other nonlinear probability models. *Annual Review of Sociology*, *44*, 39–54. https://doi.org/10.1146/annurev-soc-073117-041429

Carlson, G. J., Kordas, K., and Murray-Kolb, L. E. (2015). Associations between women's autonomy and child nutritional status: A review of the literature. *Maternal and Child Nutrition*, *11*(4), 452–482. https://doi.org/10.1111/mcn.12113

Casterline, J. B., and El-Zeini, L. O. (2007). The estimation of unwanted fertility. *Demography*, *44*(4), 729–745. https://doi.org/10.1353/dem.2007.0043

Cetorelli, V., and Leone, T. (2012). Is fertility stalling in Jordan? *Demographic Research*, *26*(13), 293–318. https://doi.org/10.4054/DemRes.2012.26.13

Cheong, Y. F., Yount, K. M., and Crandall, A. A. (2017). Longitudinal measurement invariance of the women's agency scale. *Bulletin de Methodologie Sociologique*, *134*(1), 24–36. https://doi.org/10.1177%2F0759106317693787

Croft, T. N., Marshall, A. M. J., and Allen, C. K. et al. (2018). *Guide to DHS Statistics*. Rockville, Maryland, USA: ICF. https://dhsprogram.com/data/Guide-to-DHS-Statistics/index.htm#t=Guide_to _DHS_Statistics_DHS-7.htm

Department of Statistics (DOS) and ICF (2019). *Jordan Population and Family Health Survey 2017-18*. Amman, Jordan/ Rockville, Maryland, USA: DOS and ICF.

Dodoo, F. N.-A. (1998). Men matter: Additive and interactive gendered preferences and reproductive behavior in Kenya. *Demography*, *35*(2), 229–242. https://doi.org/10.2307/3004054

Donald, A., Koolwal, G., Annan, J., Falb, K., and Goldstein, M. (2017). *Measuring women's agency*. Policy Research Working Paper No. 8148. World Bank Group.

El-Saharty, S., Elshalakani, A., Zeitoun, N., Crumpton, B., Kazem, A., Cornelia, J., and El-Assiouty, S. (2022). *Policy and strategic priorities for Egypt to reap its demographic dividend: Policy Brief*. Washington, DC: World Bank.

Eltigani, E. E. (2000). Changes in family-building patterns in Egypt and Morocco: A comparative analysis. *International Family Planning Perspectives*, *26*(2), 73–78. https://doi.org/10.2307/2648270

Elwert, F., and Winship, C. (2014). Endogenous selection bias: The problem of conditioning on a collider variable. *Annual Review of Sociology*, *176*(40), 31–53. https://doi.org/10.1146/annurev-soc-071913-043455

Engelhardt, H., Schulz, F., and Büyükkeçeci, Z. (2018). *Demographic and human development in the Middle East and North Africa*. Bamberg: University of Bamberg Press. https://doi.org/10.20378/irbo-50993

Friedrich, C. (2023). Women's agency and childbirth: The effect of transition to motherhood and subsequent births on women's agency in Egypt. *Journal of Family Research*, *35*, 400–420. https://doi.org/10.20377/jfr-907

Friedrich, C., Engelhardt, H., and Schulz, F. (2021). Women's agency in Egypt, Jordan, and Tunisia: The role of parenthood and education. *Population Research and Policy Review*, *40*(5), 1025–1059. https://doi.org/10.1007/s11113-020-09622-7

Gebel, M., and Heyne, S. (2014). *Transitions to adulthood in the Middle East and North Africa: Young women's rising?* Basingstoke: Palgrave Macmillan. https://doi.org/10.1057/9781137355560

Gray, E., Evans, A., and Reimondos, A. (2013). Childbearing desires of childless men and women: When are goals adjusted? *Advances in Life Course Research*, *18*(2), 141–149. https://doi.org/10.1016/j.alcr.2012.09.003

Gudbrandsen, N. H. (2013). Female Autonomy and Fertility in Nepal. *South Asia Economic Journal*, *14*(1), 157–173. https://doi.org/10.1177/1391561413477945

Haque, R., Alam, K., Rahman, S. M., Keramat, S. A., and Al-Hanawi, M. K. (2021). Women's empowerment and fertility decision-making in 53 low and middle resource countries: a pooled analysis of demographic and health surveys. *BMJ Open*, *11*(6), 1–12. https://doi.org/10.1136/bmjopen-2020-045952

Higher Population Council [Jordan] (2013). *National reproductive health/Family planning strategy 2013-2017*. Amman, Jordan: Higher Population Council. https://data2.unhcr.org/en/documents/download/39905

Hindin, M. J. (2000). Women's autonomy, women's status and fertility-related behavior in Zimbabwe. *Population Research and Policy Review*, *19*(3), 255–282. https://doi.org/10.1023/A:1026590717779

Iacovou, M., and Tavares, L. P. (2011). Yearning, learning, and conceding: Reasons men and women change their childbearing intentions. *Population and Development Review*, *37*(1), 89–123. https://doi.org/10.1111/j.1728-4457.2011.00391.x

James-Hawkins, L., Peters, C., VanderEnde, K., Bardin, L., and Yount, K. M. (2016). Women's agency and its relationship to current contraceptive use in lower- and middle-income countries: A systematic review of the literature. *Global Public Health*, *13*(7), 843–858. https://doi.org/10.1080/17441692.2016.1239270

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, *30*(3), 435–464. https://doi.org/10.1111/1467-7660.00125

Khan, H. T. A., and Raeside, R. (1997). Factors affecting the most recent fertility rates in urban-rural Bangladeshesh. *Social Science and Medicine*, *44*(3), 279–289. https://doi.org/10.1016/S0277-9536(96)00076-7

Kishor, S. (2000). Empowerment of women in Egypt and links to the survival and health of their infants. In H. Presser and G. Sen (Eds.), *Women's empowerment and demographic processes* (pp. 119–156). Oxford/New York: Oxford University Press.

Kohler, U., Class, F., and Sawert, T. (2023). Control variable selection in applied quantitative sociology: a critical review. *European Sociological Review*, 1–14. https://doi.org/10.1093/esr/jcac078

Krafft, C., Assaad, R., and Keo, C. (2022). The evolution of labor supply in Egypt, 1988–2018. A gendered analysis. In C. Krafft and R. Assaad (Eds.), *The Egyptian labor market: A focus on gender and vulnerability* (pp. 13–48). Oxford: Oxford University Press. https://doi.org/10.1093/oso/9780192847911.003.0002

Krafft, C., Kula, E., and Sieverding, M. (2021). An investigation of Jordan's fertility stall and resumed decline: The role of proximate determinants. *Demographic Research*, *45*(19), 605–652. https://doi.org/10.4054/DEMRES.2021.45.19

Krapf, S., Buber-Ennser, I. and Bujard, M. (2023). Education and intended number of children in Germany, Moldova and Norway: An international comparison using FReDA and GGS-II-data. *Comparative Population Studies 48*, 589–628. https://doi.org/10.12765/CPoS-2023-22

Malhotra, A., and Schuler, S. R. (2005). Women's empowerment as a variable in international development. In D. Narayan (Ed.), *Measuring empowerment: Cross-disciplinary perspectives* (pp. 71–88). Washington, DC: World Bank.

Mason, K. O. (1986). The status of women: Conceptual and methodological issues in demographic studies. *Sociological Forum*, *1*(2), 284–300. https://doi.org/10.1007/BF01115740

Mason, K. O., and Smith, H. L. (2000). Husbands' versus wives' fertility goals and use of contraception: The influence of gender context in five asian countries. *Demography*, *37*(3), 299–311. https://doi.org/10.2307/2648043

Miller, W. B. (2011). Differences between fertility desires and intentions: implications for theory, research and policy. *Vienna Yearbook of Population Research*, *9*, 75–98.

Miller, W. B., and Pasta, D. J. (1995). Behavioral Intentions: Which ones predict fertility behavior in married couples? *Journal of Applied Social Psychology*, *25*(6), 530–555. https://doi.org/10.1111/j.1559-1816.1995.tb01766.x

Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], and ICF International. (2015a). *Egypt Demographic and Health Survey 2014*. Cairo,

Egypt/Rockville, Maryland, USA: Ministry of Health and Population and ICF International.

Ministry of Health and Population [Egypt], El-Zanaty and Associates [Egypt], and ICF International (2015b). *Egypt Health Issues Survey 2015*. Cairo, Egypt/Rockville, Maryland, USA: Ministry of Health and Population and ICF International.

Moghadam, V. M. (2004). Patriarchy in transition: Women and the changing family in the Middle East. *Journal of Comparative Family Studies*, *35*(2), 137–162. https://doi.org/10.3138/JCFS.35.2.137

Moghadam, V. M. (2020). Gender regimes in the Middle East and North Africa: The power of feminist movements. *Social Politics*, *27*(3), 467–485. https://doi.org/10.1093/sp/jxaa019

Mood, C. (2010). Logistic regression: Why we cannot do what we think we can do, and what we can do about it. *European Sociological Review*, *26*(1), 67–82. https://doi.org/10.1093/esr/jcp006

Philipov, D., and Bernardi, L. (2011). Concepts and operationalisation of reproductive decisions: Implementation in Austria, Germany and Switzerland. *Comparative Population Studies*, *36*(2–3), 495–530. https://doi.org/10.4232/10.CPoS-2011-14en

Prata, N., Fraser, A., Huchko, M. J., Gipson, J. D., Withers, M., Lewis, S., … Upadhyay, U. D. (2017). Women's empowerment and family planning: A review of the literature. *Journal of Biosocial Science*, *49*(6), 713–743. https://doi.org/10.1017/S0021932016000663

Pratley, P. (2016). Associations between quantitative measures of women's empowerment and access to care and health status for mothers and their children: A systematic review of evidence from the developing world. *Social Science and Medicine*, *169*, 119–131. https://doi.org/10.1016/j.socscimed.2016.08.001

Rashad, H., Osman, M., and Roudi-Fahimi, F. (2005). *Marriage in the Arab world*. Washington, DC: Population Reference Bureau. https://www.prb.org/resources/marriage-in-the-arab-world/

Richardson, R. A. (2018). Measuring women's empowerment: A critical review of current practices and recommendations for researchers. *Social Indicators Research*, *137*(2), 539–557. https://doi.org/10.1007/s11205-017-1622-4

Rutstein, S. O., and Shah, I. H. (2004). *Infecundity, infertility, and childlessness in developing countries*. DHS Comparative Reports No. 9. Calverton, Maryland, USA: ORC Macro and the World Health Organization. https://dhsprogram.com/pubs/pdf/CR9/CR9.pdf

Salem, R., Cheong, Y. F., Miedema, S. S., and Yount, K. M. (2020). Women's agency in Egypt: construction and validation of a multidimensional scale in rural Minya. *Eastern Mediterranean Health Journal*, *26*(6), 652–659. https://doi.org/10.26719/2020.26.6.652

Samari, G. (2017a). First birth and the trajectory of women's empowerment in Egypt. *BMC Pregnancy and Childbirth*, *17*(Suppl 2), 43–55. https://doi.org/10.1186/s12884-017-1494-2

Samari, G. (2017b). Women's agency and fertility: Recent evidence from Egypt. *Population Research and Policy Review*, *36*(4), 561–582. https://doi.org/10.1007/s11113-017-9427-3

Samman, E., and Santos, M. E. (2009). *Agency and empowerment: a review of concepts, indicators and empirical evidence*. Oxford: Oxford Poverty and Human Development Initiative, University of Oxford. https://doi.org/10.5325/j.ctv14gpckz.16

Schoumaker, B. (2019). Stalls in fertility transitions in sub-Saharan Africa: Revisiting the evidence. *Studies in Family Planning*, *50*(3), 257–278. https://doi.org/10.1111/sifp.12098

Speizer, I. S., and Calhoun, L. M. (2022). Her, his, and their fertility desires and contraceptive behaviours: A focus on young couples in six countries. *Global Public Health*, *17*(7), 1282–1298. https://doi.org/10.1080/17441692.2021.1922732

Tabutin, D., Schoumaker, B., Rogers, G., Mandelbaum, J., and Dutreuilh, C. (2005). The demography of the Arab world and the Middle East from the 1950s to the 2000s. A survey of changes and a statistical assessment. *Population*, *60*(5–6), 505–591 and 593–615. https://doi.org/10.2307/4148186

Takruri, A. (2012). *Husbands' and wives' fertility desires and behaviors in Minya, Egypt. Dancing a duet or two solos?* Johns Hopkins University, Dissertation.

Testa, M. R. (2012). *Family sizes in Europe: Evidence from the 2011 Eurobarometer Survey*. Vienna: Vienna Institute of Demography.

The DHS Program (2020). *DHS Model Questionnaire - Phase 8 (English, French)*. https://dhsprogram.com/publications/publication-DHSQ8-DHS-Questionnaires-and-Manuals.cfm

Thorpe, S., VanderEnde, K., Peters, C., Bardin, L., and Yount, K. M. (2016). The influence of women's empowerment on child immunization coverage in low, lower-middle, and upper-middle income countries: A systematic review of the literature. *Maternal and Child Health Journal*, *20*(1), 172–186. https://doi.org/10.1007/s10995-015-1817-8

Tilahun, T., Coene, G., Temmerman, M., and Degomme, O. (2014). Spousal discordance on fertility preference and its effect on contraceptive practice among married couples in Jimma zone, Ethiopia. *Reproductive Health*, *11*(27), 1–10. https://doi.org/10.1186/1742-4755-11-27

Upadhyay, U. D., Gipson, J. D., Withers, M., Lewis, S., Ciaraldi, E. J., Fraser, A., … Prata, N. (2014). Women's empowerment and fertility: A review of the literature. *Social Science and Medicine*, *115*, 111–120. https://doi.org/10.1016/j.socscimed.2014.06.014

Upadhyay, U. D., and Karasek, D. (2012). Women's empowerment and ideal family size: An examination of DHS empowerment measures in Sub-Saharan Africa. *International Perspectives on Sexual and Reproductive Health*, *38*(2), 78–89. https://doi.org/10.1363/3807812

Wolff, B., Blanc, A. K., and Ssekamatte-Ssebuliba, J. (2000). The role of couple negotiation in unmet need for contraception and the decision to stop childbearing in Uganda. *Studies in Family Planning*, *31*(2), 124–137. https://doi.org/10.1111/j.1728-4465.2000.00124.x

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. Cambridge, Massachusetts/London, England: MIT Press.

Yount, K. M., VanderEnde, K. E., Dodell, S., and Cheong, Y. F. (2016). Measurement of women's agency in Egypt: A national validation study. *Social Indicators Research*, *128*(3), 1171–1192. https://doi.org/10.1007/s11205-015-1074-7

Appendix

Table A1: Coefficient estimates of involvement in decision-making on ideal number of children from Poisson regression models, currently married women with children aged 15-49.

	Involvement in decision-making (count)		Major household purchases		Visits to family or relatives		Own healthcare	
	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan
Involved	-0.018*	-0.002	-0.037*	0.003	-0.041*	-0.006	-0.018	-0.017
	(0.008)	(0.006)	(0.018)	(0.012)	(0.019)	(0.014)	(0.023)	(0.016)
Number of living children	0.081***	0.053***	0.082***	0.053***	0.081***	0.053***	0.082***	0.053***
	(0.007)	(0.003)	(0.007)	(0.003)	(0.007)	(0.003)	(0.007)	(0.003)
Age	0.002+	0.000	0.002+	0.000	0.002+	0.000	0.002+	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Education (ref. = low)								
medium	0.015	-0.034+	0.015	-0.034+	0.015	-0.034+	0.014	-0.033+
	(0.024)	(0.018)	(0.024)	(0.018)	(0.024)	(0.018)	(0.024)	(0.018)
high	-0.023	-0.058**	-0.024	-0.059**	-0.023	-0.058**	-0.025	-0.057**
	(0.021)	(0.019)	(0.021)	(0.019)	(0.021)	(0.019)	(0.021)	(0.019)
Employed	0.033	0.013	0.032	0.012	0.032	0.013	0.029	0.013
	(0.024)	(0.014)	(0.024)	(0.014)	(0.024)	(0.014)	(0.024)	(0.014)
Wealth quintiles (ref. = poorest)								
poorer	0.010	-0.015	0.009	-0.016	0.008	-0.015	0.008	-0.015
	(0.024)	(0.013)	(0.024)	(0.013)	(0.024)	(0.013)	(0.024)	(0.013)
middle	0.006	-0.007	0.006	-0.007	0.003	-0.007	0.004	-0.006
	(0.027)	(0.014)	(0.027)	(0.014)	(0.027)	(0.014)	(0.027)	(0.014)
richer	-0.039	-0.007	-0.039	-0.008	-0.043	-0.007	-0.043	-0.007
	(0.031)	(0.015)	(0.031)	(0.015)	(0.031)	(0.015)	(0.031)	(0.015)
richest	-0.055	-0.032+	-0.055	-0.032+	-0.059	-0.032+	-0.061+	-0.032
	(0.037)	(0.019)	(0.037)	(0.019)	(0.037)	(0.019)	(0.037)	(0.019)
Muslim	0.085*	-	0.085*	-	0.086*	-	0.086*	-
	(0.036)	-	(0.036)	-	(0.036)	-	(0.036)	-
Region (Egypt, ref. = Urban Governorates)								
Lower Egypt	-0.033	-	-0.032	-	-0.034	-	-0.033	-
	(0.028)	-	(0.028)	-	(0.028)	-	(0.028)	-
Upper Egypt	0.088**	-	0.090**	-	0.086**	-	0.087**	-
	(0.028)	-	(0.028)	-	(0.028)	-	(0.028)	-
Frontier Governorates	0.072+	-	0.076*	-	0.072+	-	0.076*	-
	(0.038)	-	(0.038)	-	(0.038)	-	(0.038)	-

	Involvement in decision-making (count)		Major household purchases		Visits to family or relatives		Own healthcare	
	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan
Region (Jordan, ref. = North)								
Central	-	-0.039***	-	-0.039***	-	-0.039***	-	-0.039***
	-	(0.011)	-	(0.011)	-	(0.011)	-	(0.011)
South	-	-0.004	-	-0.004	-	-0.004	-	-0.005
	-	(0.012)	-	(0.012)	-	(0.012)	-	(0.012)
Urban	-0.029	-0.032**	-0.029	-0.032**	-0.028	-0.032**	-0.027	-0.032**
	(0.028)	(0.012)	(0.028)	(0.012)	(0.028)	(0.012)	(0.028)	(0.012)
Constant	0.839***	1.288***	0.823***	1.282***	0.832***	1.287***	0.819***	1.296***
	(0.064)	(0.032)	(0.063)	(0.031)	(0.064)	(0.032)	(0.065)	(0.032)
BIC	17630.62	48633.15	17631.08	48633.30	17630.52	48633.17	17634.63	48632.14
Observations	5,090	12,054	5,090	12,054	5,090	12,054	5,090	12,054

Significance levels: $^{+}p < 0.1$; *p < 0.05; **p < 0.01; ***p < 0.001

Table A2: Coefficient estimates of involvement in decision-making on the ability to limit the number of children to ideal from linear probability models, currently married women with children aged 35-49.

	Involvement in decision-making (count)		Major household purchases		Visits to family or relatives		Own healthcare	
	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan
Involved	0.000	0.020**	-0.041+	0.050**	-0.000	0.022	0.072*	0.041+
	(0.011)	(0.008)	(0.024)	(0.016)	(0.026)	(0.020)	(0.032)	(0.022)
Age	-0.009***	-0.007***	-0.009***	-0.007***	-0.009***	-0.007***	-0.010***	-0.007***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Education (ref. = low)								
medium	-0.004	-0.007	-0.001	-0.006	-0.004	-0.004	-0.006	-0.005
	(0.030)	(0.023)	(0.030)	(0.023)	(0.030)	(0.023)	(0.030)	(0.023)
high	0.089***	0.030	0.090***	0.031	0.089***	0.035	0.087***	0.033
	(0.026)	(0.024)	(0.026)	(0.024)	(0.026)	(0.024)	(0.026)	(0.024)
Employed	0.056*	0.054**	0.061*	0.054**	0.056*	0.057**	0.051+	0.056**
	(0.027)	(0.018)	(0.027)	(0.018)	(0.027)	(0.018)	(0.027)	(0.018)
Wealth quintiles (ref. = poorest)								
poorer	-0.014	0.037*	-0.010	0.037*	-0.014	0.038*	-0.021	0.038*
	(0.033)	(0.018)	(0.033)	(0.018)	(0.033)	(0.018)	(0.033)	(0.018)
middle	-0.040	0.085***	-0.034	0.084***	-0.039	0.087***	-0.047	0.087***
	(0.038)	(0.019)	(0.037)	(0.019)	(0.037)	(0.019)	(0.037)	(0.019)
richer	-0.029	0.108***	-0.021	0.108***	-0.029	0.110***	-0.037	0.109***
	(0.044)	(0.020)	(0.044)	(0.020)	(0.043)	(0.020)	(0.043)	(0.020)
richest	-0.037	0.122***	-0.026	0.123***	-0.036	0.124***	-0.046	0.124***
	(0.049)	(0.023)	(0.049)	(0.023)	(0.049)	(0.023)	(0.049)	(0.023)
Muslim	-0.085+	-	-0.087*	-	-0.085+	-	-0.081+	-
	(0.044)	-	(0.043)	-	(0.043)	-	(0.043)	-
Region (Egypt, ref. = Urban Governorates)								
Lower Egypt	-0.011	-	-0.009	-	-0.011	-	-0.011	-
	(0.034)	-	(0.034)	-	(0.034)	-	(0.034)	-
Upper Egypt	-0.038	-	-0.034	-	-0.038	-	-0.037	-
	(0.034)	-	(0.034)	-	(0.034)	-	(0.034)	-
Frontier Governorates	-0.129**	-	-0.129**	-	-0.129**	-	-0.123*	-
	(0.049)	-	(0.049)	-	(0.049)	-	(0.049)	-
Region (Jordan, ref. = North)								
Central	-	0.072***	-	0.071***	-	0.073***	-	0.073***
	-	(0.015)	-	(0.015)	-	(0.015)	-	(0.015)
South	-	0.061***	-	0.059***	-	0.060***	-	0.062***
	-	(0.016)	-	(0.016)	-	(0.016)	-	(0.016)
Urban	0.046	-0.009	0.042	-0.009	0.046	-0.008	0.048	-0.009
	(0.038)	(0.016)	(0.038)	(0.016)	(0.038)	(0.016)	(0.038)	(0.016)

	Involvement in decision-making (count)		Major household purchases		Visits to family or relatives		Own healthcare	
	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan
Constant	1.109***	0.757***	1.131***	0.769***	1.110***	0.782***	1.052***	0.765***
	(0.120)	(0.068)	(0.118)	(0.067)	(0.119)	(0.068)	(0.120)	(0.068)
BIC	2918.63	8653.57	2915.80	8650.41	2918.63	8659.40	2913.43	8657.12
Observations	2,144	6,261	2,144	6,261	2,144	6,261	2,144	6,261

Significance levels: $^{+}p < 0.1$; *p < 0.05; **p < 0.01; ***p < 0.001

Table A3: Coefficient estimates of involvement in decision-making on the ability to limit the number of children to ideal from linear probability models, currently married women with children aged 35-49 with information on husband's fertility desires. With interaction term between involvement in decision-making and the difference in fertility ideals between spouses.

	Involvement in decision-making (count)		Major household purchases		Visits to family or relatives		Own healthcare	
	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan
Involved	0.068***	0.071***	0.137***	0.198***	0.178***	0.126**	0.226***	0.232***
	(0.016)	(0.016)	(0.035)	(0.034)	(0.037)	(0.042)	(0.047)	(0.046)
Involved *Wife lower	-0.141***	-0.105***	-0.401***	-0.296***	-0.382***	-0.305***	-0.385***	-0.296***
	(0.011)	(0.010)	(0.034)	(0.029)	(0.034)	(0.028)	(0.031)	(0.027)
Age	-0.010*	-0.012***	-0.009*	-0.011***	-0.009*	-0.012***	-0.010*	-0.012***
	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)
Education (ref. = low)								
medium	-0.016	-0.005	-0.012	-0.011	-0.013	0.004	-0.023	-0.004
	(0.042)	(0.047)	(0.043)	(0.047)	(0.043)	(0.047)	(0.042)	(0.047)
high	0.018	0.054	0.011	0.049	0.026	0.064	0.023	0.058
	(0.036)	(0.050)	(0.036)	(0.051)	(0.036)	(0.050)	(0.036)	(0.050)
Employed	0.069+	0.013	0.078*	0.016	0.071+	0.018	0.070+	0.009
	(0.038)	(0.036)	(0.038)	(0.036)	(0.038)	(0.036)	(0.037)	(0.036)
Wealth quintiles (ref. = poorest)								
poorer	0.025	0.034	0.028	0.033	0.027	0.039	0.023	0.035
	(0.046)	(0.039)	(0.046)	(0.039)	(0.047)	(0.039)	(0.046)	(0.039)
middle	-0.035	0.063	-0.028	0.065	-0.033	0.071+	-0.040	0.060
	(0.051)	(0.040)	(0.051)	(0.040)	(0.051)	(0.040)	(0.051)	(0.040)
richer	-0.061	0.109*	-0.050	0.114**	-0.056	0.118**	-0.067	0.106*
	(0.057)	(0.043)	(0.057)	(0.043)	(0.057)	(0.043)	(0.056)	(0.043)
richest	-0.029	0.121*	-0.013	0.125**	-0.026	0.126**	-0.037	0.120*
	(0.065)	(0.047)	(0.065)	(0.047)	(0.065)	(0.047)	(0.065)	(0.047)
Muslim	0.021	-	0.015	-	0.012	-	0.022	-
	(0.062)	-	(0.062)	-	(0.062)	-	(0.062)	-
Region (Egypt, ref. = Urban Governorates)								
Lower Egypt	0.113*	-	0.114*	-	0.108*	-	0.111*	-
	(0.047)	-	(0.047)	-	(0.048)	-	(0.047)	-
Upper Egypt	0.077+	-	0.076	-	0.074	-	0.073	-
	(0.046)	-	(0.047)	-	(0.047)	-	(0.046)	-
Frontier Governorates	-0.028	-	-0.029	-	-0.037	-	-0.030	-
	(0.061)	-	(0.061)	-	(0.061)	-	(0.061)	-

	Involvement in decision-making (count)		Major household purchases		Visits to family or relatives		Own healthcare	
	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan
Region (Jordan, ref. = North)								
Central	-	0.082**	-	0.080**	-	0.081**	-	0.084**
	-	(0.031)	-	(0.031)	-	(0.031)	-	(0.031)
South	-	0.054+	-	0.054+	-	0.049	-	0.062+
	-	(0.032)	-	(0.032)	-	(0.032)	-	(0.032)
Urban	0.136**	0.018	0.128*	0.014	0.129*	0.023	0.143**	0.017
	(0.051)	(0.033)	(0.051)	(0.033)	(0.051)	(0.033)	(0.051)	(0.033)
Constant	0.860***	0.885***	0.902***	0.883***	0.863***	0.932***	0.843***	0.848***
	(0.184)	(0.141)	(0.184)	(0.140)	(0.184)	(0.140)	(0.186)	(0.142)
BIC	1182.07	1798.51	1197.98	1813.05	1203.44	1800.22	1179.94	1798.37
Observations	955	1,336	955	1,336	955	1,336	955	1,336

Significance levels: $^{+}p < 0.1$; *p < 0.05; **p < 0.01; ***p < 0.001

Table A4: Coefficient estimates of involvement in decision-making on ideal number of children from Poisson regression models, currently married women with children aged 15-49.

	Involvement in decision-making (count)		Major household purchases		Visits to family or relatives		Own healthcare	
	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan
Involved	-0.016*	-0.002	-0.034+	0.003	-0.039*	-0.006	-0.016	-0.017
	(0.008)	(0.006)	(0.018)	(0.012)	(0.019)	(0.014)	(0.023)	(0.016)
Number of living children	0.080***	0.053***	0.081***	0.053***	0.080***	0.053***	0.081***	0.053***
	(0.007)	(0.003)	(0.007)	(0.003)	(0.007)	(0.003)	(0.007)	(0.003)
Age	0.003*	0.000	0.003*	0.000	0.003*	0.000	0.002*	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Education (ref. = low)								
medium	0.014	-0.034+	0.014	-0.035+	0.015	-0.034+	0.014	-0.033+
	(0.024)	(0.018)	(0.024)	(0.018)	(0.024)	(0.018)	(0.024)	(0.018)
high	-0.020	-0.056**	-0.020	-0.058**	-0.020	-0.057**	-0.022	-0.055**
	(0.021)	(0.019)	(0.021)	(0.019)	(0.021)	(0.019)	(0.021)	(0.019)
Wealth quintiles (ref. = poorest)								
poorer	0.011	-0.015	0.010	-0.016	0.009	-0.015	0.009	-0.015
	(0.024)	(0.013)	(0.024)	(0.013)	(0.024)	(0.013)	(0.024)	(0.013)
middle	0.007	-0.006	0.007	-0.007	0.004	-0.006	0.004	-0.006
	(0.027)	(0.014)	(0.027)	(0.014)	(0.027)	(0.014)	(0.027)	(0.014)
richer	-0.037	-0.007	-0.038	-0.007	-0.041	-0.007	-0.041	-0.006
	(0.031)	(0.015)	(0.031)	(0.015)	(0.031)	(0.015)	(0.031)	(0.015)
richest	-0.053	-0.031	-0.053	-0.031	-0.057	-0.031	-0.059	-0.031
	(0.037)	(0.019)	(0.037)	(0.019)	(0.037)	(0.019)	(0.037)	(0.019)
Muslim	0.086*	-	0.085*	-	0.086*	-	0.086*	-
	(0.036)	-	(0.036)	-	(0.036)	-	(0.036)	-
Region (Egypt, ref. = Urban Governorates)								
Lower Egypt	-0.031	-	-0.030	-	-0.032	-	-0.031	-
	(0.028)	-	(0.028)	-	(0.028)	-	(0.028)	-
Upper Egypt	0.090**	-	0.092***	-	0.088**	-	0.089**	-
	(0.028)	-	(0.028)	-	(0.028)	-	(0.028)	-
Frontier Governorates	0.077*	-	0.080*	-	0.076*	-	0.080*	-
	(0.037)	-	(0.037)	-	(0.037)	-	(0.037)	-
Region (Jordan, ref. = North)								
Central	-	-0.039***	-	-0.039***	-	-0.039***	-	-0.039***
	-	(0.011)	-	(0.011)	-	(0.011)	-	(0.011)
South	-	-0.004	-	-0.004	-	-0.004	-	-0.004
	-	(0.012)	-	(0.011)	-	(0.012)	-	(0.012)
Urban	-0.029	-0.032**	-0.028	-0.032**	-0.027	-0.032**	-0.027	-0.032**
	(0.028)	(0.012)	(0.028)	(0.012)	(0.028)	(0.012)	(0.028)	(0.012)

	Involvement in decision-making (count)		Major household purchases		Visits to family or relatives		Own healthcare	
	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan	Egypt	Jordan
Constant	0.828***	1.287***	0.813***	1.281***	0.822***	1.287***	0.810***	1.295***
	(0.064)	(0.032)	(0.063)	(0.031)	(0.063)	(0.032)	(0.065)	(0.032)
BIC	17623.99	48624.56	17624.36	48624.65	17623.78	48624.57	17627.58	48623.61
Observations	5,090	12,054	5,090	12,054	5,090	12,054	5,090	12,054

Significance levels: $^{+}p < 0.1$; *p < 0.05; **p < 0.01; ***p < 0.001

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