

**DETERMINANTS OF THE DESIRE TO STOP CHILDBEARING  
AMONG WOMEN IN SOUTHERN GHANA: PARITY  
PROGRESSION, PARTNER EFFECTS, AND SITUATIONAL  
FACTORS**

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## **Abstract**

Fertility limitation may be driven by the achievement of family size targets. Since each child is born at a different stage of the life course, however, fertility preferences may also be influenced by past reproductive, social, economic experiences, and perceptions about the future. In this study, the determinants of the desire to stop childbearing were analyzed, using individual-level longitudinal data on the reproductive lives of a sample of women in southern Ghana. Using a fixed-effects logit regression technique, we modeled the impact of reproductive life cycle events, health experiences, perceptions of future household economic conditions, and spousal interactions on a woman's preference to stop childbearing. We learned that women are most likely to want to stop childbearing at the normative ideal family size of four children. Declining health, perceptions of spousal preference conflict and economic concerns are also significant determinants of the desire to limit births.

## **Introduction**

The desire to stop childbearing is expected to be a natural progression in the reproductive life course. A common notion in demography is that people decide the number of children they want over their reproductive lives and stop childbearing whenever that number is achieved (Henry 1961; Becker 1960; Easterlin and Crimmins 1985). However, since each child is born at different stages of the parents' life course, childbearing preferences could be based on both past childbearing outcomes and current circumstances (Namboodiri 1972, 1983). Fertility decisions are thus closely linked to the reproductive life course. For example, the experience of unintended or mistimed births, or child loss or an undesirable gender composition of children, might cause plans for fertility limitation to be reconsidered, despite long-term family-size targets. Besides past childbearing experiences, individuals may also react to unforeseen influences on the demand for children. Household income may fluctuate over the reproductive life cycle, jobs may be secured or lost, and changing macroeconomic and social conditions may affect couples at different family formation stages. Furthermore, the fertility decision would have to include considerations of the desires of spouses. Strong influence may also be exerted by the social environment especially by extended family members and friends who may want to enforce fertility norms. While people do not always succumb to social pressures, deviation from family size norms may invoke serious cost-benefit considerations at the personal level.

In this paper, we examined the extent to which a woman's reproductive history, perceptions of spousal preferences, social interaction and perceptions of economic conditions affect her desire to stop childbearing at different points in time. Given the woman's reproductive circumstances and her perceptions of her partner's childbearing preferences, we investigated how her preferences are influenced by her perceptions of changing health and economic conditions and by her social interactions. We explored these questions using individual-level longitudinal data on the reproductive lives of women in six communities in southern Ghana from 1998–2003. This study consisted of eight waves of panel data. In each interview, which included a host of reproductive background, household and attitudinal questions, women were asked whether they would like to have a (another) child. Of specific interest in this paper, were the determinants of the woman's stated preferences to stop childbearing. Using the fixed-effects logit regression technique, we modeled the impact of reproductive life cycle events and outcomes, spousal interactions, health experiences, perceptions of past and future household economic conditions, and interactions with friends and relatives on the woman's preference to stop childbearing.

Research on fertility preferences in sub-Saharan Africa continues to receive considerable interest in demography because of its connection with the future course of fertility in the region. However, so far this body of research has mainly focused on the correlates of fertility preferences -- particularly, the determinants of desired family size, unmet need for contraception and the ramifications of husband-wife interactions in terms of power relations and conflicts in couples' fertility decision-making. Due to the scarcity of

longitudinal demographic data in the region, very few empirical studies have focused on the dynamics of individual fertility preferences over the reproductive lifecycle; as such, we know very little about which factors come into prominence when individuals want to stop childbearing. The strength of this study is the breadth of factors investigated and the level of analysis.

In the next section we provide an overview of the applicable literature and discuss the hypotheses guiding the analyses. Following that section, we describe the dataset and application of the fixed effects regression model. We conclude by presenting the empirical findings and discuss their implications.

### **Theoretical Framework**

The examination of the individual-level determinants of the desire to limit fertility raises the issue of selecting an applicable decisional approach to fertility decision making. The neoclassical economic theory of fertility posits that the decision about how many children to have is made once -- at the onset of marriage or the parenting career and that couples stop having children when they attain the desired number (Easterlin and Crimmins 1985; Becker 1960, 1981; Willis 1973). The theory posits that the greatest motivation for limiting births rests on achieving the desired number, even though the desired number may be revised along the life course (McClelland 1983; Lee 1980). In low fertility countries, empirical evidence from several decades generally show that family size expectations closely matched completed family size but only at the aggregate level

(Westoff and Ryder 1977; Bumpass and Westoff 1970). For individuals or couples in both low and high fertility countries, many studies have found that the correspondence between family size targets at earlier stages of the reproductive cycle and completed family size is only fairly moderate (Hagewen and Morgan 2005; Toulemon and Testa 2005; Voas 2003; van de Kaa 2001; Chang and Tey 1994; Westoff and Ryder 1977). Alternatively, proponents of the sequential (successive) model of fertility decision-making believe that it is more realistic that the decision-making calculus is done one birth at a time (Namboodiri 1972, 1983). The decision problem in this model is centered on whether or not to have a (or another) child, rather than the optimal number of children to have. Thus, fertility decisions involve a multifaceted series of choices over the life course. The birth of each child changes both the family circumstances and parental evaluations of the costs and benefits having additional children. Even though the logic appears practical to understanding changing decision patterns, systematic empirical testing of the sequential model has been limited to aspects of the model due to its greater complexity and data demands (examples are Udry 1983; Hofferth 1983; Fried et al. 1980; Hout 1978; Namboodiri 1974). More importantly, it is more appealing to understand fertility limitation from the perspective of the principle that outcomes associated with previous reproductive experiences and perceptions of marital, social and economic circumstances at the time of decision making, do affect the probability of wanting another child. We discuss this point further in developing explanatory variables for the analysis.

### *Previous Reproductive Experience*

It is conceivable that the childbearing experience itself would change perceptions about family size. The sheer number of children that parents have to care for could reduce the demand to have more, especially if resources are limited. Besides, if past pregnancies were mistimed, parents are likely to face additional unanticipated costs which could reduce subsequent demand. Unintended delays in childbearing or long birth intervals, on the other hand, could also reduce demand especially if fecundity problems set in later in life. Furthermore, child mortality has been postulated to affect fertility demand through the couple's response to actual child loss, or through the anticipation of child deaths (Montgomery and Cohen 1998; Mauskopf 1983). Assessments of general probabilities of risks may differ from personal experiences of risk. The death of a child may theoretically present the opportunity to invest more in the quality of life of the surviving children, especially if some children were unwanted, but the experience of child death could also reduce perceptions of survival chances of remaining children – in which case there could be considerations of adding more children. The gender composition of surviving children is another important factor that could determine whether to stop or continue childbearing. The desire for having a balance between sons and daughters is widespread in most parts of Africa, even though in some cultures son preference is predominant (Short and Kiros 2002). If the gender composition of surviving children is not optimal, the demand for children may be affected depending on the perceived likelihood of having a son or daughter the next time, the value attached to maintaining the status quo vis-à-vis adding another child, and the relative importance of different gender compositions (for example,

an all-boys family could be better accommodated than an all-girls family in a patriarchal society). Gender imbalance could lead to a desire for another child if parents take a chance at correcting the imbalance. Other reproductive circumstances such as divorce and remarriage could affect the likelihood of the desire to stop childbearing.

### *Partner Preferences*

The preference to limit births is usually formed in the context of a marital relationship which exerts great influence on partners through spousal communication and social power. Spouses influence on each other's preferences is often unequal. Research comparing husbands' and wives' fertility preferences indicate that marital partners are separate actors whose reproductive preferences are not always congruent (Short and Kiros 2002; Casterline et al. 2001; Ngom 1997; Dodoo 1993; Thomson 1997; Binka et al. 1995; Thomson et al. 1990). When there is agreement on preferences, it may be based on discussion leading to acquiescence, coincidentally similar preferences, or projection of own preferences on partner's preferences. Generally, spousal communication has been shown to be positively associated with fertility limitation (Oyediran et al. 2006; Lasee and Becker 1997; Mahmood and Ringheim 1997; Bongaarts and Bruce 1995; Salway 1994). Since most of the evidence come from cross-sectional surveys, it is unclear whether spousal discussion is a determinant or correlate of fertility regulation. Furthermore, the literature suggests that husbands influence and exercise power in childbearing decisions in a major way in Africa (DeRose 2007; Oyediran et al. 2006; Feyisetan 2000; Bankole and Singh 1998; Isiugbo-Abanihe 1994). The extent to which

this influence affects preference formation is a dimension which has received little attention in the literature, which has primarily focused on spousal effects on contraceptive use and actual fertility. It is critical to place in proper perspective the effects of interactions within the husband-wife dyad on women's preferences. These interactions may involve prior spousal conversations about having children, or perceptions of spousal preferences gathered through other means (Blanc et al. 1996).

In modeling the determinants of preferences of one partner, how we integrate the influence of the other partner's preferences deserves attention. A few models have been proposed to address this question (Miller et al. 2004; Sobel and Arminger 1992). In Miller and colleagues' framework, each partner's actual desires and perceptions of the other's desires determine their own intentions which ultimately drive their joint behaviour. In predicting or explaining fertility behaviour (which is naturally attributable to both partners), it is necessary to include both partners' preferences ascertained independently as covariates. When examining preferences from one partner's point of view, perceived partner preference is the only measurable component for assessing the influence of the other partner, as one does not know the actual preference of the partner. Therefore, in explaining the determinants of one partner's preferences, one has to be mindful of the implications of any tendency on the respondent's part to bias the report of the preferences. Miller and colleagues discuss the nature of potential biases in reported preferences and point out that such tendencies appear to be largely personal dispositions (also, Severy and Silver 1993). One can argue that due to the power imbalance in most conjugal relationships in Africa, the more common bias may be that women report their

husbands' preferences as their own. Again, there is scanty empirical evidence on the extent to which measures of perceived preferences in sub-Saharan Africa reflect significant perceptual bias. Mott and Mott (1985) examined this question and found that West African women's fertility preferences were a reflection of their own preferences and not their husband's. While there is little reason to doubt that sub-Saharan African women correctly report their husbands' preferences (DeRose et al. 2004; Dodoo et al. 2001), when a measure of perceived spousal agreement is a predictor of own preferences, one could run into the problem of endogeneity bias if women tend to attribute or accept their partners' preferences as their own. Potential bias stemming from such tendencies can be resolved with longitudinal data using the appropriate statistical techniques – by controlling for unmeasured personal tendencies that may be correlated with the explanatory variables.

More importantly, cross-sectional evidence suggests that husbands influence fertility attitudes in substantial ways (Ezeh 1993; Oheneba-Sakyi et al. 1995). Furthermore, when spouses do not share similar preferences, husbands tend to want more children (Short and Kiros 2002; Bankole and Singh 1998; Dodoo 1998; Bankole 1995; Ezeh 1993). Therefore, we can expect that women who want to stop childbearing will be less likely to share similar preferences as their husbands (as perceived by the wives) at the point of transition. Women who want to stop childbearing will tend to have less perceived preference agreement with their husbands.

### *Material Conditions*

Behavioural models of fertility are premised on the fact that individuals or couples make fertility decisions being cognizant of the trade-off between having children and enjoying other aspects of life. It may be argued that since high fertility societies are generally associated with pronatalist norms, women would aim for their often large ideal number of children and would only want to stop having children when they are constrained by their material circumstances. Although material constraints (economic, social, health, etc.) set objective limits on what people can achieve, they are evaluated subjectively and may be perceived correctly or incorrectly. This subjective evaluation is also reflected in people's perception of the costs (and benefits) of having children at any point. Since fertility decisions may be made by spouses and other family members who control resources in the family, the cost of childrearing may not be solely borne by the woman. Older family members may be directly responsible for the day to day care of children. However, the cost of another pregnancy on the woman's health falls squarely on her. Given her reproductive experience, it is her perceptions of the net value of the additional child that matters. Such perceptions may be equally as relevant to considerations of stopping childbearing as objective measures of her circumstances.

Some studies suggest that due to increased uncertainty and hardship characterizing life in Africa, most African women or couples may not base their fertility motivations on prior long-term considerations - that their fertility desires may be influenced more by a mix of short-term, often unstable factors connected with the quest to survive the economic,

cultural and social pressures (Johnson-Hanks 2007, 2005; Agadjanian 2001, 2005). The desire to stop childbearing may be a temporary response to economic hardship rather than an internalized aspiration for a particular family size. A somewhat parallel argument draws from the empirical reality that in sub-Saharan Africa, a substantial amount of modern contraceptive use is for birth spacing rather than for averting unwanted pregnancies (Bledsoe 2002; Bledsoe et al. 1998; Caldwell and Caldwell 1981). Accordingly, Agadjanian (2005, pp. 627) argues that the conceptual distinction between “spacing” and “limiting” births may be an unrealistic distinction to ordinary Africans. These empirical observations seem to reasonably suggest that the meaning Africans assign to fertility control connotes spacing the number of children that life circumstances allow. They further suggest that the desire to stop childbearing may be determined almost equally or perhaps, to a greater extent by non-reproductive circumstances than by reproductive lifecycle factors. These pieces of evidence may also suggest that the preference to stop childbearing may not be held strongly since they are subject to revisions based on changes in social, economic and other life circumstances. What is unclear is the extent to which preferences already reflect anticipated conditions in the face of such uncertainty.

One can argue that because of pronatalist norms, women may tend not to say they want to stop childbearing lightly. Preferences may tend to be least affected by “normal” changes in their household economic or social conditions. In other words, changes in situational factors may not cause changes in preferences if they are considered mundane. For a situational factor to significantly impact the desire to stop childbearing (more than say

their reproductive or husband-related factors), that factor should be considered serious and/or unanticipated (Udry 1983). For example, a woman with less than three children in Africa may be much less likely to succumb to the pressures of her economic circumstances than one with five children, but she could stop childbearing on the basis of a serious health problem. It is reasonable to expect that the considerations that are topmost on women's minds when stating preferences is likely to eventually depend on their reproductive life stage – specifically the number of children already born. We argue that generally women's reproductive circumstances and perceived spousal preferences rather than situational factors would dictate whether or not they desire to stop childbearing.

#### *Normative Expectations and Social Pressure*

According to the theory of reasoned action and planned behavior (Ajzen and Fishbien 1980), a person's intentions or desire to perform an action is determined by her beliefs about the consequences of the action, the perception of value of the consequences, the beliefs about what significant others think he or she should do, and the motivation to comply with those expectations. In all societies, there are social norms prescribing what the acceptable family size should be. People experience social pressure to have children at parities below the normative family size threshold. Likewise, there is pressure to limit births at or above the normative family size. Apart from family size norms, there are other norms prescribing when to stop childbearing (Bledsoe 2002; Page and Lesthaeghe 1981). As individuals consider childbearing options, they are sometimes influenced by

people around them – relatives, friends, health workers etc. There is much empirical evidence suggesting that the influence of individuals or groups has a bearing on reproductive behaviour, particularly contraceptive behaviour (Madhavan et al. 2003; Berhman et al. 2002; Barber et al. 2002; Godley 2001; Casterline et al. 2000; Arends-Kuenning et al. 1999; Kohler 1997; Rutenberg and Watkins 1997; Montgomery and Casterline 1996). Studies show that a woman is more likely to adopt the reproductive behaviour of women in her social network. The critical questions here relate to how such interactions influence personal fertility preferences, who the influential people are, and whether such influences can outweigh the influence of spouses in particular. The influence of other individuals in fertility decision making is difficult to substantiate through survey interviews. Social influence or pressures may simply be internalized and expressed as personal motivations or preferences for normative expectations. It is possible that individuals may be reluctant to disclose such social influence, especially familial pressure to have children or opposition to fertility limitation. In addition, those who have already decided to stop childbearing could be the ones who proactively seek information from friends, relatives and health workers regarding reproductive issues. Such information seeking could create potential selectivity bias. One way of disentangling the effect of social interaction is by ascertaining whether conversations relating to having additional children occurred within respondents' support networks before the survey - whether such conversations had a positive or negative impact in the choice to limit births at a later time.

## *Hypotheses*

With the above background, we expect that factors related to women's reproductive circumstances such as her age, the number of living children, the gender balance of living children, the experience of child mortality, and marital transitions, will be strong predictors of preferences. The likelihood that women would desire to stop childbearing should increase with age and parity. Women with children of the same gender would be more hesitant to quit childbearing than those with mixed gender. Likewise, child loss and marital transition would be negatively associated with the desire to stop childbearing. While the literature generally suggests that spousal discussion should increase women's likelihood of wanting to stop childbearing, discussion could reduce the likelihood of wanting to stop because one can argue that it is more likely to be the case that women will be less likely to want to stop childbearing after discussion with husbands who tend to want more children. Perceived spousal agreement could also reduce the likelihood to want to stop childbearing. We also expect that reproductive circumstances, spousal discussion and perceived spousal preference agreement will be more salient determinants than situational factors. Better prospects of the household economic situation, personal health, etc. would lead to reluctance to stop childbearing, all else equal; because as literature suggests, in sub-Saharan Africa, people want to stop childbearing when times are hard (Eloundou-Enyegue et al. 2000; Lindstrom and Berhanu 1999; Shapiro 1996; Rutenberg and Diamond 1995). In line with the social networks literature, positive social interaction (such as encouragement to adopt birth control) would increase the likelihood of fertility limitation, while negative influence would reduce the likelihood of desiring to stop. Apart from overt influences through discussions with social networks, we expect

that women who have attained the normative ideal family size would be more likely to say they want to stop childbearing than those who are below the normative ideal parity. We discuss how we estimated the effects of the above factors on the odds that a woman would choose to stop childbearing in the next section.

## **Methods**

To understand what factors determine fertility preferences, an analysis of the variation within an individual's responses is necessary. Longitudinal data on fertility preferences of the same woman over time provides a means of modeling the determinants of preference transitions while controlling for all unobserved personal factors which are stable over the period of observation and may be correlated with stated preferences and the explanatory variables. For example, women who marry early and/or have children at young ages tend to have more children in their lifetime and are more prone to say they want to stop childbearing than those who start out late. It is conceivable that such women are also biologically more fecund, or may be less effective in the use of contraception, or perhaps may just intrinsically want much larger families than those who start out late (Lee 1983). Secondly, even though women may share similar cultural, linguistic, socio-economic, or religious backgrounds their "tastes" for children potentially vary. The notion of "taste" is an economic parlance which captures other preferences that inform how parents allocate resources between children and other wants. These preferences could comprise things parents' desire for themselves or for their children; for example, the quality of child-raising, quality of education, the need for social recognition, the desire to continue the

family name, and the quest for old age security through children. Tastes may be socially-patterned and acquired through exposure to similar fertility norms (Mason 1983; Easterlin 1987). However, individuals do not always conform to such norms. Although most people may want to stop childbearing at the normative ideal family size, some choose to have more, while others have less. What drives such individual-level differences is difficult to directly measure and is generally subsumed under differential tastes. Although tastes can potentially change, they are generally assumed to be stable over the life course (Easterlin 1987). Thirdly, as alluded to earlier, there is the tendency for some women to have their husbands' preferences predominating their stated preferences. Conversely, some women may be reporting their own preferences as their husbands'. Such tendencies, which are unobserved, will be correlated with measures of perceived partner agreement and own preferences. Fourthly, given similar initial situations, people will differ in their propensity to stick to their preferences in the face of changing circumstances – this psychological disposition is also not deliberately measured. To put it briefly, some dimensions of personal motivation to stop childbearing will be different for each woman and may affect explanatory variables in ways that need to be controlled for in the model.

Woman-specific unobserved factors may be addressed in several ways. One could find a proxy variable for the specific unobserved characteristic and use that in the model. Alternatively, where appropriate “instruments” are available for those explanatory variables that are correlated with the unobserved factors, instrumental variable estimation can be used to obtain consistent parameter estimates (Wooldridge 2002). Appropriate

panel data techniques can also resolve the issue of bias due to unobserved heterogeneity. The fixed-effects regression technique allows us to model woman-specific variation in preferences; where unmeasured woman-specific factors that are constant over the observation period are allowed to be arbitrarily correlated with explanatory variables (Allison 2005). With this method, one is able to control for all time-constant individual differences, whether measured or unmeasured. We employed the fixed-effects regression method because of its advantage in reducing most of the theoretical problems discussed earlier.

### *Empirical Model*

To investigate the factors surrounding the preference for no more children, let  $Y_{it}$  be a binary dependent variable capturing whether or not a woman wanted to stop childbearing, in a given round,  $t$ .  $Y_{it} = 1$  if she said she wanted to stop and  $Y_{it} = 0$  otherwise. Let  $p_{it}$  denote the probability that a woman  $i$ , chose to stop in round  $t$ , we could assume that the dependence of  $p_{it}$  on the predictor variables is explained by a regular logit model of the form:

$$\log (p_{it}/ 1-p_{it}) = aY_i + bX_{it} + cZ_{it} \quad (1)$$

where  $Y_i$  represents time-invariant covariates such as the woman's educational level, tribe, or ethnicity;  $X_{it}$ , the reproductive life cycle variables which are time-varying and  $Z_{it}$  represents other covariates such as discussions with various people including partners and economic perspectives at the time of interview. However, unbiased estimates of  $a$ ,  $b$  and  $c$  are hindered by constant unobserved variables which are correlated with these

variables. A substantial correlation between these unmeasured variables and the  $X_{it}$ ,  $Z_{it}$  variables may erroneously give the impression that these variables exert a causal effect on the preference to stop childbearing. As mentioned earlier, a regression model with a fixed effect for each woman is one way to deal with the potential bias posed by time-constant unobserved variables. The fixed effects logit model also eliminates potential selectivity bias by comparing the probability of making a choice by the same woman under different values of the predictors, thereby isolating only the impact of the predictors on the woman's preferences. The fixed effects model includes an additional woman-specific parameter  $u_i$  as follows:

$$\log (p_{it}/ 1-p_{it}) = b'X_{it} + c'Z_{it} + u_i \quad (2)$$

Accordingly, the fixed effects model addresses concerns about time-constant woman-specific omitted variables and allows each woman to have her own inclination to stop childbearing, over and above what can be explained through the predictor variables in the model. The effects of time-constant explanatory variables are not directly estimated as their effects as well as the woman-specific effect cancel out of equation (2). Since women who consistently said they wanted no more children or who consistently said they wanted more children provide no information (in a statistical sense) about the effect of explanatory variables, the analysis focuses on women who said they wanted children in at least one round of interviews and who said they wanted no more children in other rounds. The parameters of the model can be estimated using a conditional likelihood function (Chamberlain 1980). We performed the estimation procedure using STATA 9.2 (StataCorp 2006).

### *Data Description*

We used a longitudinal study conducted in six rural communities in southern Ghana between 1998 and 2004. The study included eight rounds of reproductive and household surveys of women who were between 15-50 years at the onset of the study - a total of 1219 women in the first round and 1205 by the eighth round. Two hundred and nine women who were originally scheduled to be interviewed in round one but were unable to have their interviews were added to the sample in the second round. These women were asked all round one questions that could be asked retrospectively as well as the questions for round two.

The rounds were not all uniformly timed; however five of them had intervals of about one year. About 35 percent of the sample had no formal schooling; 24 percent had some elementary education or completed elementary school and 41 percent had at least some secondary school education. Sixty-six percent of the sample came from the Akan tribe; 22 percent from Ga and Adangbe tribes and 11 percent from other tribes. The sample consisted predominantly of Christians (60 percent) and Moslems (21 percent). As at the first round of the survey, 81 percent of the sample was either currently married or in stable union; 9 percent was never married and 10 percent was separated, divorced or widowed. The proportion of currently married women was more than 80 percent across rounds. The mean age of the sample was 31 years. The mean number of children ever born was 3.5 (standard deviation of 2.9) at the beginning of the survey; it increased to 4.1 by the last round. The mean number of living children, which was 2.8 at the onset, rose to 3.4 by the end of the study. Thirty-seven percent of the sample had experienced the death

of a child before the first round. During the study period, there were relatively few cases of child deaths (about 40 cases).

### *Variables*

In each round, the women were asked the following fertility preference question: “Would you like to have a (another) child with your husband/partner or would you prefer not to have any more children with him?” Our dependent variable is a binary variable capturing whether or not the woman wants a child or wants no more children. A value of 1 represents a choice for no more children. The overall sample has 9613 woman-rounds. In 37 percent of the woman-rounds, women indicated they wanted no more children. Table 1 presents the distribution of the dependent and independent variables for the overall sample, for the sample of women who ever said they wanted no more children and for the eventual estimation sample. The estimation sample comprised only women who changed preferences over the course of the study.

[ Insert Table 1 here ]

The data allow us to study a variety of time-varying determinants under broad categories. The first category of explanatory variables is related to the woman’s reproductive life cycle and comprised variables capturing her age, number of living children, whether her children were of the same gender or mixed, whether she had experienced a marital transition between interviews, and whether she had experienced the death of a child between rounds. Initially, we included a variable capturing the age of her last child. This

variable was not statically significant and did not significantly change the results. Moreover, it was associated with undesirable missing case deletions; therefore it was excluded from the model. The second category deals with her partner's influences – specifically, whether they had discussed having a child since the last interview and whether her preference at the time of the interview was the same as her report of her partner's preference (perceived partner agreement). Using the measure of perceive agreement instead of the actual partner preferences has both conceptual and practical value in this analysis. Conceptually, even if partner preferences were independently ascertained and included as a predictor, it is primarily the woman's perception of her partner's preference that would count in determining her own preference. The issue raised earlier is that one needs to control for any tendency on the woman's part to bias her report of her husband's preferences or her own preferences. Practically, including partner's actual responses would substantially reduce the sample size for the fixed-effects estimation as quite a substantial proportion of the wives do not have matched husband interviews.

Two variables indicating whether or not the woman had had a serious health problem between interviews; and whether her health condition at the time of the interview was better, the same or worse than the last interview, constituted the third category. The fourth category includes a variable measuring the woman's perceptions of her future household economic situation. Women were asked in each round to compare their household economic situation at that time to the past and to indicate their outlook on the future. Using Principal Components Analysis, we also measured the woman's economic

circumstances with a wealth index indicating her relative household wealth based on the quality of housing, water, sanitation facilities and ownership of durable assets. Since the household wealth data were collected multiple times, the women's relative percentile rank is time-varying, albeit with little variability. The wealth index is conceptually a measure of the household's long term wealth - it is unlikely that small changes in relative wealth would impact fertility preferences in a significant way in the immediate term. Besides, it was measured in only three of the rounds, making it appear stable over time. Due to this slight variability and lack of statistical significance, the wealth index was excluded from the model after the preliminary runs. The next set of variables related to the dimension of the woman's social interactions between interviews. These variables include six dummy variables indicating whether she had talked to someone who encouraged her to use contraceptives, whether she had talked to someone who discouraged her from using contraceptives, whether she had discussed the cost/benefit of having another child with a relative, whether she had discussed the cost/benefit of having another child with a friend, whether she had visited the capital city or a big city at least once a month. These proxy variables reflect the direct effects of social interactions on the preference to limit births. All these variables were not statistically significant in initial runs. Moreover, the inclusion of these variables was not associated with a statistically significant improvement in model fit. We therefore excluded these variables in the final model. The last category includes three attitude scales on the cost/benefit of an additional child to the woman. They were asked to rate on an 11-point scale the cost of feeding and clothing another child educating another child and to rate the demand of another pregnancy on their health.

We tested the relative impact of three major types of predictors of the desire to stop childbearing: reproductive life cycle factors, spousal interaction and preferences, and other associated situational events and attitudes (variables in categories 3 to 5) via stepwise regression and compared the  $-2\log$ -likelihood values across the models to determine the reduction in the variance explained by adding predictors. We present the empirical findings in the following section.

## **Results**

As mentioned earlier, the eventual sample estimation comprised only women whose fertility preferences changed in the course of the study. The mean age of women in this sample was 32.9 - they were only slightly older than the average woman in the entire sample but much younger than the average for women who ever said they did not want more children (Table 1). Their mean parity was 3.8, which was less than one child compared to those who ever said they did not want children. Women in this sample were also less likely to have experienced a marital transition, or lost a child but were more likely to have had a child during the study period than the average women in the entire sample. They were also generally slightly more likely to be uncertain about their future household economic situation, and more likely to have talked with someone about family planning than the average women in the entire sample.

[Insert Table 2 here]

Table 2 shows the impact of the independent variables on the odds of desiring to stop childbearing. Model 1 includes only variables related to the woman's reproductive life circumstances. In model 2, we add two variables regarding her interactions with her husband; namely whether there was preference agreement (as perceived by the wife) and whether they had discussed the costs and benefits of having another child since the last interview. In model 3, we add variables pertaining to her health condition, economic perspectives, and the perceived cost and benefits of having another child. Comparing models 1 and 2, the difference in the -2log-likelihood statistic and the pseudo R-squared values indicate that husband-related factors explain a significant amount of the variance in women's preferences. A similar comparison of models 2 and 3, shows that the additional variance explained by the inclusion of all the other variables is much smaller than the contribution of the husband-related variables. This pattern is maintained when the order of inclusion of the variables is reversed (see Table 3). Also note that except for parity, the inclusion of the successive sets of variables hardly changed the magnitude, direction and statistical significance of preceding variables in the model. This means that these factors exert direct independent effects on the desire to stop childbearing.

[Insert Table 3 here]

The effect of the number of children on preference formation is mainly captured through additional births during the course of the study. We decided to break down this

information by successive parities, to investigate two dimensions of fertility preferences. First, we wanted to know how likely women were to desire to stop childbearing when they attained different parities. Secondly, examining the effect of parity progression allowed us to investigate the role of normative (not personal) family size expectations. We estimated the model using variables for different parity progressions with the assumption that women who attained the mean ideal number of births would be the most likely to say they wanted to stop childbearing than those at lower parities. The mean ideal number of children for the entire sample was 4.4 children. This figure compares well to the national average. In 1998, the mean ideal number of children for all women in Ghana was 4.3, while that for 2003 was 4.4 (Ghana Statistical Service and Macro International Inc. 1999; Ghana Statistical Service, Noguchi Memorial Institute for Medical Research, and ORC Macro. 2004). Therefore we expected that women would have the greatest likelihood to stop after the fourth birth. The birth of the first or second child had no effect on the desire to stop childbearing. Holding other variables constant, the effect of parity starts with the birth of the third child and is strongest, in magnitude and statistical significance, after the birth of the fourth child - the odds increase three-fold. The effect of parity on the desire to limit births appears to be non-linear in nature.

We also observe that each additional year of age increased the odds of wanting no more children by a factor of 1.25, controlling for other variables. Having children of the same gender, and experiencing a marital transition (mostly marriages) were both associated with a lower likelihood of wanting to stop childbearing, although these variables were not statistically significant. Women who thought they shared similar preferences as their husbands at the time of interview were much less likely to say they wanted no more

children – their odds reduced by 71 percent compared with those who did not share spousal preferences. A substantial majority of the times when women expressed spousal preference agreement, they both wanted more children. Women who said they wanted no more children were more likely to think they were in disagreement with their husbands regarding having the next child. Similarly, when women discussed having additional children with their husbands, they were subsequently less likely to say they wanted to stop childbearing.

[Insert Table 4 here]

Fertility preferences may be responsive to changes in the perception of the household's economic welfare. Generally, when a woman thought that her household economic condition was going to worsen, the odds that she would want to stop increased by 1.8 fold compared with times when she thought her economic situation would be better. We tested for differences in the perceptions of economic welfare at different parity stages. We found that the tendency to want to stop childbearing due to perceptions of worsening economic circumstances was elevated at lower parities (1 or 2 children) but not in the mid-parities (3 or 4 children) or at high parities (5 or more children) (see Table 4). Along similar lines, the odds of wanting no more children increased by 1.8 times when women thought their health condition had deteriorated compared to times when they thought they were just as healthy as the last interview. While at mid-parities, women do not appear to want to limit births on the basis of their perceptions of worsening future household

conditions, they were more responsive to perceptions of failing health conditions. Mid-parity women were 2 times as likely to say they wanted to limit births when they perceived their health condition to be worse than at the previous interview than when they thought their health was better (Table 4). Generally, at high parities women were less likely to say they wanted to limit births on grounds of their general health than at lower parities. However, a striking finding is the effect of the perception of the demand of another pregnancy on the woman's health. While generally the odds that a woman would want to stop childbearing when she thought that the pregnancy would threaten her health increased by 1.09 with every point increase on the cost/benefit scale (Table 3), this effect was stronger at high parities than at lower parities (Table 4).

Perceptions of the cost of feeding and clothing an additional child did not have any effect on the odds of wanting another child. Furthermore, as indicated earlier, none of the predictors we included to capture the effects of the woman's social interaction was statistically significant but most showed the expected direction of the effects. For example, when a woman talked to someone who encouraged her to adopt birth control before the interview, she was more likely to say she wanted to stop childbearing. She was, however, less likely to want to stop childbearing when someone discouraged her from using contraception.

## **Discussion and Conclusions**

Using data from a prospective study of women in their reproductive years, we examined some determinants of the desire to stop childbearing at the personal level. We found that the desire to stop childbearing is influenced by aging, the number of children born, spousal fertility preferences, concerns about health and household economic welfare. At the personal level, a woman's reproductive history and her husband's preferences were the key drivers of her desire to stop, all else equal.

The women in our sample were not likely to want to limit births before they had the third child. The odds of wanting to stop childbearing peaked at the fourth child and decreased subsequently. This pattern is not altogether surprising. We know that rationalization is a ubiquitous measurement problem in measuring fertility preferences, particularly for high parity women. Some women will tend to say that they want more children when they have had an unplanned birth or when they think it is the socially desirable answer given their reproductive circumstances. It is also possible that women who want children at high parities genuinely desire larger families. In traditional societies, especially where polygamy is practiced, having many children may be a means to secure one's marriage, or to gain social status or access to family resources (DeRose 2007; DeRose et al. 2002). It may also be the case that women at high parities come to the realization that fertility decisions are not directly within their individual control and succumb to spousal preferences, having experienced or anticipated conflict (Blanc et al. 1996). This reasoning however contrasts with what Bankole (1995) found among urban Nigerian women. Bankole found that women were better able to achieve their reproductive preferences at higher parities than at lower parities when there was spousal conflict –

implying that women may have stronger sense of control at those parities. While one cannot rule out the applicability of Bankole's finding to Ghana, we are inclined to believe from our analysis and from other evidence that men exert latent power at high parities as well. Ezeh (1993) found that in Ghana, women's attitudes are influenced by their partners and not the other way round. The fact that women in our sample (who were mostly in the middle or at the end of their reproductive cycle) were much less likely to want to stop when they had discussed childbearing decisions with their partners could well indicate their lack of power in that sphere. Most studies on the power dimensions of spousal interaction focus on outcomes like contraceptive use or actual fertility, which are at the end of the decision chain. Lukes (1986) and Komter (1989) point out that power within relationships should not only be measured by observable outcomes like whose fertility preferences were realized at a later time, but also by the influence of potential imperceptible factors which affect how partners think, feel or act. The latter may operate through internalizing or assenting to dominant values and institutional structures. They argue that genuine agreement does not necessarily mean there are no reservations. Conflicts would come up if subordinates express their desires in a context where seemingly innate power discrepancies do not exist. The prevailing power structure in marital relationships in Africa fits this description. For example, women who want to stop childbearing are generally the most likely to adopt contraception. However, the desire to limit births may not motivate contraceptive use if women do not feel they have their partners' support. The present finding goes to buttress much research pointing out the extent of the male role determining the pace of fertility transition in sub-Saharan Africa.

What then can be said about women's demand for fertility control -- is it spousal power relations, the normative ideal family size, or economic considerations that drives fertility limitation? It is conceivable that for some women, the desire to limit births would be influenced solely by their husbands' demand, while for others preferences would be determined by normative expectations. Yet, in some cases, preferences would be driven by poverty: perceptions regarding the worsening household economic welfare lead women, especially at low parities, to prefer to limit births (Johnson-Hanks 2007, 2005; Agadjanian 2005; Eloundou-Enyegue et al. 2000). The evidence considered here suggests that preferences are determined by all these factors to different extents over the reproductive life course. We found that the economic utility models which emphasize cost/benefit considerations, as well as the sociological theories which emphasize that people respond to family size norms, both appear to be validated in this empirical analysis -- both subjective utility elements and normative considerations are incorporated into fertility decisions. One would expect that the greater the perceived burden of children relative to personal and family resources, the greater the propensity to quit childbearing would be. From our sample, the net impact of the cost (and benefit) of feeding, clothing and educating an additional child showed little predictive value for fertility limitation. The only cost-benefit consideration that appears to be important to women is the health risk of another pregnancy, particularly at high parities. While it is difficult to imagine that women do not have a realistic view about the cost of feeding and clothing an additional child, the same cannot be said for the perceived cost of education. Educational costs and benefits will occur in the future and may have no precise value at

the decision-making point – such notions may be vague compared with health concerns which are more immediate and real, given that women have the benefit of experience. What is emerging from our analysis is the extent to which perceptions of economics, health and social norms drive preferences at different parities. Economic considerations are more salient at lower parities while normative family size expectations and health concerns feature more strongly later in the reproductive life course.

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Table 1: Means and standard deviations of explanatory variables for the overall sample, sample of women wanting no additional children, and sample used for estimation: Social learning, social influence and fertility control project, 1998-2003.

Explanatory Variables	Total sample	Sample of women wanting no more children*	Estimation sample
Total Number of Woman-rounds	9613	3549	2504
Percent	100.0	36.9	26.1
<b>1. Reproductive life cycle</b>			
Age	31.70 (8.6)	38.10 (7.4)	32.87 (7.1)
Number of living children	3.10 (2.4)	5.00 (2.0)	3.84 (1.7)
Had mixed gender children	0.85 (0.4)	0.98 (0.1)	0.92 (0.3)
Experienced a marital transition between interviews	0.08 (0.3)	0.05 (0.2)	0.02 (0.2)
Experienced death of child between interviews	0.06 (0.2)	0.07 (0.3)	0.01 (0.1)
Gave birth between interviews	0.08 (0.3)	0.09 (0.3)	0.13 (0.3)
<b>2. Partner preferences and discussion</b>			
Perceived partner agreement at interview	0.78 (0.4)	0.63 (0.5)	0.76 (0.4)
Discussed cost/benefit of having a child with partner since last interview	0.62 (0.5)	0.52 (0.5)	0.63 (0.5)
<b>3. Health situation</b>			
Had severe health problems since last interview	0.23 (0.4)	0.24 (0.43)	0.21 (0.4)
Current health condition better than last interview	0.58 (0.5)	0.57 (0.5)	0.56 (0.5)
Current health condition worse than last interview	0.09 (0.3)	0.10 (0.3)	0.09 (0.3)
<b>4. Household future economic outlook</b>			
Future household economic situation better	0.37 (0.5)	0.31 (0.5)	0.40 (0.5)
Future household economic situation the same	0.04 (0.2)	0.04 (0.2)	0.05 (0.2)
Future household economic situation worse	0.05 (0.2)	0.07 (0.3)	0.06 (0.2)
Future household economic situation uncertain <sup>b</sup>	0.41 (0.5)	0.47 (0.5)	0.50 (0.5)
<b>5. Perceived cost of additional child<sup>c</sup> (mean)</b>			
Cost of feeding and clothing another child	5.14 (2.9)	6.32 (2.7)	5.44 (2.6)
Cost of educating another child	5.68 (3.0)	6.81 (2.7)	5.95 (2.7)
Demand of another pregnancy on woman's health	4.22 (3.1)	5.67 (3.0)	4.3 (2.9)

<sup>a</sup> numbers in parenthesis are standard deviations. b: this category includes women who said "up to God" or "cannot tell". c: measured on a scale of 0-10, with 0 representing no cost and 10, extremely costly. \* The second column includes all women who ever said they did not want to have children. Column 3 excludes all women who consistently said they did not want children.

Table 2: Odds-ratios for fixed effects logit regression of the determinants of the desire to stop childbearing among southern Ghanaian women, 1998-2003 – main effects models

Explanatory Variables	Model 1	Model 2	Model 3
<b>1. Reproductive life cycle</b>			
Age	1.19***	1.24***	1.25***
Had mixed gender children	1.56	1.35	1.35
Experienced a marital transition between interviews	0.51	0.60	0.58
Experienced child death between interviews	0.61	0.56	0.54
Gave birth to first child	1.57	0.98	0.96
Gave birth to second child	1.11	1.09	1.19
Gave birth to third child	1.53 <sup>†</sup>	1.70*	1.75*
Gave birth to fourth child	2.64***	2.83***	2.93***
Gave birth to fifth child	2.80**	2.20*	2.13*
Gave birth to sixth or higher child	2.43**	2.40**	2.39*
<b>2. Partner preferences and discussion</b>			
Perceived partner agreement at interview		0.29***	0.29***
Discussed cost/benefit of child with partner since last interview		0.66**	0.68**
<b>3. Health situation</b>			
Had a severe health problem since last interview			0.99
Current health condition better than last interview <sup>a</sup>			1.17
Current health condition worse than last interview <sup>a</sup>			1.76**
<b>4. Future economic outlook</b>			
Future household economic situation the same <sup>b</sup>			0.75
Future household economic situation worse <sup>b</sup>			1.79*
Future household economic situation uncertain <sup>b</sup>			1.11
<b>5. Perceived cost of additional child</b>			
Cost of feeding and clothing additional child			0.99
Cost of educating additional child			1.06
Demand of another pregnancy on woman's health			1.09***
-2Log-likelihood	-935.00	-867.57	-844.52
Degrees of freedom	10	12	21
McFadden's adjusted R-squared	0.03	0.10	0.11
Akaike Information Criteria	1890.00	1759.13	1731.03
Number of woman-rounds	2504	2504	2504
Number of women	410	410	410

<sup>†</sup>p > .10, \*p < 0.05; \*\*p < 0.005; \*\*\*p < 0.0001; a: reference category is "current health condition is the same as last interview" b: reference category is "future household economic situation better"

Table 3: Odds-ratios for fixed effects logit regression of the determinants of the desire to stop childbearing among Ghanaian women, 1998-2003 - reverse variable inclusion

Explanatory Variables	Model 1	Model 2	Model 3
<b>1. Reproductive life cycle</b>			
Age			1.25***
Had mixed gender children			1.35
Experienced a marital transition between interviews			0.58
Experienced child death between interviews			0.54
Gave birth to first child			0.96
Gave birth to second child			1.19
Gave birth to third child			1.75*
Gave birth to fourth child			2.93***
Gave birth to fifth child			2.13*
Gave birth to sixth or higher child			2.39*
<b>2. Partner preferences and discussion</b>			
Perceived partner agreement at interview		0.30***	0.29***
Discussed cost/benefit of child with partner since last interview		0.73**	0.68**
<b>3. Health situation</b>			
Had a severe health problem since last interview	1.09	1.03	1.00
Current health condition better than last interview <sup>a</sup>	1.22	1.27†	1.17
Current health condition worse than last interview <sup>a</sup>	1.56*	1.51*	1.76**
<b>4. Future economic outlook</b>			
Future household economic situation the same <sup>b</sup>	0.69	0.76	0.75
Future household economic situation worse <sup>b</sup>	1.46†	1.51†	1.79*
Future household economic situation uncertain <sup>b</sup>	1.14	1.12	1.11
<b>5. Perceived cost of additional child</b>			
Cost of feeding and clothing additional child	1.01	1.01	0.99
Cost of educating additional child	1.04	1.04	1.06
Demand of another pregnancy on woman's health	1.10***	1.10***	1.09***
-2Log-likelihood	-948.36	-886.44	-842.75
Degrees of freedom	9	11	21
McFadden's adjusted R-squared	0.016	0.078	0.110
Akaike Information Criteria	1914.71	1794.89	1731.03
Number of woman-rounds	2504	2504	2504
Number of women	410	410	410

†p > .10, \*p < 0.05; \*\*p < 0.005; \*\*\*p < 0.0001; a: reference category is "current health condition is the same as last interview" b: reference category is "future household economic situation better"

Table 4: Odds-ratios for fixed effects logit regression of the determinants of the desire to stop childbearing among Ghanaian women, 1998-2003 - model with interactions

Explanatory Variables	Odds-ratios
<b>1. Reproductive life cycle</b>	
Age	1.27***
Had mixed gender children	1.35
Experienced a marital transition between interviews	0.55
Experienced child death between interviews	0.56
Gave birth to first child	0.90
Gave birth to second child	1.26
Gave birth to third child	1.82*
Gave birth to fourth child	2.74***
Gave birth to fifth child	2.66*
Gave birth to sixth or higher child	2.42*
<b>2. Partner preferences and discussion</b>	
Perceived partner agreement at interview	0.28***
Discussed cost/benefit of child with partner since last interview	0.67**
<b>3. Health situation</b>	
Current health condition better than last interview	
Parity 1-2 women	0.84
Parity 3-4 women <sup>a</sup>	1.00
Parity 5+ women	0.56
Current health condition the same as last interview	
Parity 1-2 women	0.93
Parity 3-4 women	0.90
Parity 5+ women	0.40*
Current health condition worse than last interview	
Parity 1-2 women	1.95
Parity 3-4 women	2.01*
Parity 5+ women	0.43
<b>4. Future economic outlook</b>	
Future household economic situation the same as last interview	
Parity 1-2 women	0.36
Parity 3-4 women	0.91
Parity 5+ women	0.65
Future household economic situation better than last interview	
Parity 1-2 women	0.88
Parity 3-4 women	1.03
Parity 5+ women	0.74
Future household economic situation worse	
Parity 1-2 women	2.96*
Parity 3-4 women	0.93
Parity 5+ women	2.34
Future household economic situation uncertain <sup>a</sup>	1.00
<b>5. Perceived cost of additional child</b>	
Cost of feeding and clothing additional child	1.00
Cost of educating additional child	1.08

Table 4 (continued): Odds-ratios for fixed effects logit regression of the determinants of the desire to stop childbearing among Ghanaian women, 1998-2003 - model with interactions

Demand of another pregnancy on woman's health	
Parity 1-2 women	1.03
Parity 3-4 women <sup>a</sup>	1.00
Parity 5+ women	1.12**
-2Log-likelihood	-836.64
Degrees of freedom	33
McFadden's adjusted R-squared	0.10
Akaike Information Criteria	1742.93
Number of woman-rounds	2504
Number of women	410

†p > .10, \*p < 0.05; \*\*p < 0.005; \*\*\*p < 0.0001; a: reference category for variable