J. biosoc. Sci. (2001) **33**, 481–502

SPOUSES' SOCIOECONOMIC CHARACTERISTICS AND FERTILITY DIFFERENCES IN SUB-SAHARAN AFRICA: DOES SPOUSE'S EDUCATION MATTER?

JOSEPH MASUDI UCHUDI

Center on Population, Gender and Social Inequality, University of Maryland, 2112 Art–Sociology Building, College Park, MD 20742–1315, USA

Summary. Although the general objective of this study is to examine the extent to which spouses' socioeconomic characteristics determine whether modern contraception is used and whether family limitation (the demand for no more children) is desired, its central goal is to evaluate the degree to which the net effect of a woman's education on those fertility decisions is altered once a control is made for the level of schooling of the husband. Individual characteristics of spouses included as controls in this analysis are on the one hand women's attributes relating to employment, age, parity, ethnic identity, and urban residence and, on the other hand, the occupation of the husband. Data used in this research are provided by DHS surveys conducted in fourteen sub-Saharan countries: Mali, Burkina Faso, Niger, Nigeria, Cameroon, Benin, Senegal, Ghana, Central African Republic, Kenya, Zambia, Zimbabwe, Namibia and Rwanda. With two dichotomous outcome variables, logistic regression was used to estimate two nested models for each dependent variable and for each country covered by the study. DHS respondents used as units of analysis in this study are women who were married (any kind of union) and non-pregnant at the time when each national survey was conducted. The findings suggest that, while an educated wife needs the support of an educated husband to state a preference for family limitation in contemporary sub-Saharan Africa, controlling for husband's education and other relevant covariates does little to undermine the evidence that woman's advanced education and the adoption of modern family planning are positively related in the developing world.

Introduction

The relationship between women's education and fertility behaviour has always been a central concern in demographic research because formal education has widely been found to be a more significant determinant of fertility than any other modernization

https://doi.org/10.1017/S0021932001004813 Published online by Cambridge University Press

variable (Cochrane, 1979, 1983; Jejeebhoy, 1995). In the years since the publication of studies based on the World Fertility Survey and Demographic and Health Survey (DHS) data, a great deal of work has shown that in a wide variety of settings, the more the schooling a woman has obtained, the fewer the children she is likely to have. The statistical relationship between women's education and fertility remains strong even after removing the effects of confounding factors such as the socioeconomic and demographic factors that are usually associated with both education and fertility (Jejeebhoy, 1995). Accordingly, public policy discourse has increasingly assumed that investments in women's education are important for reducing the demand for children and fertility levels in the developing world.

Despite the abundance of empirical evidence that women's education has a significant negative effect on fertility desires in most developing countries (Jejeebhoy, 1995), little is known with certainty about the exact nature of such a relationship throughout Africa south of the Sahara (Jejeebhoy, 1995; van de Walle & Foster, 1990; Cochrane & Farid, 1990). The classic inverse relationship between a woman's education and the demand for children is not evident in most sub-Saharan countries and, when it does appear, it is often weak or insignificant (Acsadi & Johnson-Acsadi, 1990). A possible explanation for this African peculiarity is near-uniformity in the level of fertility motivation among many segments of populations, including urban residents and the better educated. In recent years, however, the African continent has undergone rapid social change despite the persistence of numerous economic problems. Given the high levels of educational advancement achieved in the post-independence period (Kritz & Gurak, 1989; Lloyd, Kaufman & Hewett, 1998), there is reason to expect a strong inverse association between women's schooling and the demand for children because educated women are generally innovative and successful in protecting their interests and in pursuing goals other than childbearing. However, waves of economic reversals and/or structural adjustment policies that have characterized the region for about two decades are likely to have reduced the strength of the relationship between education and fertility by undermining and/or reversing some earlier gains (Lloyd *et al.*, 1998).

Statement of the research problem

The aim of this study is not only to examine the role of the level of schooling of each spouse in the determination of whether family limitation is desired or whether modern contraception is used across a region as diverse as Africa south of the Sahara after several decades of socioeconomic development, but also to evaluate the extent to which the net effect of a woman's education is altered once controls are made for husband's education and other relevant covariates. This research is thus expected to assess the pertinence of the premise that the role of wife's education in shaping fertility behaviour is composed of two separate effects representing the net impact of the level of education of each spouse. Such a claim is based on the belief that the relative influence of wife's education on fertility determination is usually overestimated in studies which fail to introduce a control for the separate role played by husband's education. Investigating the impact of spouses' socioeconomic attributes on

fertility differences across a large number of sub-Saharan countries is appropriate because it might shed light on how characteristics of social units that make decisions about childbearing and family size contribute to reproductive dynamics across the region. An assessment of the nature of the association between spouses' individual attributes and fertility choices may inform and guide family planning research and policy, not only on the nature of fertility orientations and their underlying dynamics but also on strategies to achieving fertility transition in the region.

The two study questions that guide this research are: (1) What is the nature of the relationship between the level of schooling of each spouse and fertility choices in sub-Saharan Africa, net of the effects of other individual attributes of each spouse included as controls in the analysis? and (2) Does the relative influence of wife's education on fertility decisions change when controls are made for both husband's education and other individual characteristics of each spouse? If so, what is the nature of the change in the effect of wife's schooling, and what is the nature of the effects associated with other spouses' attributes? Husband's education should have relevance in fertility research because households headed by men who are highly educated are more likely than others to have a high socioeconomic standing and, consequently, to participate more fully in modernization and/or secularization processes (Caldwell & Caldwell, 1987; van de Walle & Foster, 1990). The rationale underlying this claim is the premise that the education of the husband should play a non-negligible role in reproductive processes throughout a region like Africa south of the Sahara where culturally structured autocratic traditions subordinate women to men and lineages and where fertility decision-making is a male's prerogative (Frank & McNicoll, 1987; Frank, 1987; van de Walle & Foster, 1990, p. 33; Ezeh, 1993; Gage & Njogu, 1994; Caldwell & Caldwell, 1987).

Patriarchy is deeply entrenched in Africa's social institutions (Konde, 1992), affording husbands absolute decision-making power, and forcing wives to subordinate their interests to theirs (Caldwell & Caldwell, 1987). Patriarchy maintains a strong desire for large families (Frank & McNicoll, 1987, p. 212) and ensures that women are continuously kept busy with childrearing and desire large families. In many developing countries, men deny their wives access to contraception because they fear that it will encourage promiscuity (Omondi-Odhiambo, 1997, p. 29). In this context, even if a woman feels the need to use family planning or to stop childbearing, she may not initiate the process without her husband's consent.

Analytical framework

Formal education and fertility

A better understanding of how emerging societal conditions affect reproduction depends on the assessment of the effects of characteristics of social units intervening in childbearing processes, for social dynamics that determine fertility decisions operate through those channels. Relevant factors to consider in an examination of fertility differences in sub-Saharan societies are socioeconomic attributes of spouses and, more specifically, the level of schooling of each spouse. Although there is general consensus about the importance of formal education, there is little agreement

on the mechanisms through which schooling operates to affect the demand for children. Among other things, the typical interpretations of what education stands for include the following: intellectual development, access to resources or information, openness to external influences, and greater decision-making autonomy of the educated spouse. For example, by increasing their intellectual capacity and bargaining skills, education gives women a sense of self-confidence and authority that allows them to interact more equally with men in most contexts and to emphasize the realization of goals other than childbearing (Cochrane, 1979, 1983; Kasarda, Billy & West, 1986).

The modernization literature holds the belief that formal education is the key to fertility change by transforming women's attitudes and values from traditional to more modern, and their behaviour from constrained to more emancipated. This literature also raises the hypothesis that education not only leads to a greater consciousness of child costs and economic benefits of small families but is also associated with greater opportunity costs for the mother (Jejeebhoy, 1995; Kirk, 1996). In this perspective, in comparison with their counterparts who are uneducated, educated women tend to prefer few but 'high quality' children to many children of relatively poorer 'quality'. Education contributes to the lowering in fertility motivation by exposing women to beliefs and values that promote aspirations for individual advancement (Caldwell, 1982), by making them aware of alternative world-views and opportunities, and by motivating them to develop interests other than childbearing (Cochrane, 1979, 1983). The principal measure of social change is education, which changes people's view of the world by increasing their ability to understand life on earth from a more secular perspective. The more secular people are (even if they live in poorly developed countries), the greater the chance they will believe that they have the ability to control important aspects of their lives. It is then reasonable to claim that as women's schooling increases, their relations with their husbands and/or family elders will become more egalitarian, the value they place upon children will decrease, and their demand for children will also decrease. Nearly everywhere in the world, the better educated a woman (and/or her husband) is, the fewer children she is likely to have. A greater equality between the spouses within the domestic sphere provides married women with greater autonomy and control over various dimensions of their lives, including reproduction.

The literature suggests that there are at least two major avenues through which formal education can reduce the number of children women want (Jejeebhoy, 1995). First, educated women are more self-reliant and less dependent on children for economic and social survival than uneducated women are. For example, they do not need repeated motherhoods to enhance status and secure old-age support. They also may not need large numbers of children to legitimize their position in their husband's family. Second, economic and opportunity costs associated with children are expected to be higher among better educated than poorly educated women (Schultz, 1976; Becker, 1981). In Caldwell's view (1980, p. 227), 'the greatest impact of education is not direct but through the restructuring of family relationships and household economies and by shifting upward the costs of children.' Educated parents tend to concede that the demands of educated children are legitimate, even if irritating and impoverishing.

Data and variables

Data. The data used in this study come from DHS surveys conducted in fourteen sub-Saharan countries: Kenya (1993), Rwanda (1992), Zambia (1992), Zimbabwe (1994), Namibia (1992), Central African Republic (1994/95), Cameroon (1991), Ghana (1993), Nigeria (1990), Niger (1992), Senegal (1992/93), Mali (1995/96), Burkina Faso (1992/93) and Benin (1996). In addition to measuring fertility and family planning, these surveys contain information on characteristics of spouses and households. This study is limited, however, to those individual attributes for which comparable data are available for all the fourteen countries covered by the study.

In order to carry out an analysis which does not need to capture the effects of marriage environments and pregnancy status, study subjects are restricted to (1) women who were married (any kind of union) at the time of the survey, and (2) women who were not pregnant at that time. What is important about the first criterion is the fact that throughout Africa south of the Sahara most childbearing occurs within marital unions (Table 1) and that births amongst unmarried or never-married women are uncommon. As summarized by Table 1, the relevance of this criterion is seen in the fact that most DHS respondents (women aged 15–49) were married (any kind of union) at the time of the survey. The structure of the study sample for each country covered by the study is less likely to be systematically distorted as a result of the second criterion because most DHS respondents were not pregnant at the time of the survey (Table 1). The importance of the second substantive restriction resides in the fact that women who are pregnant are likely to have fertility views or choices that might be inaccurate. This criterion takes into account the fact that while pregnant married women are more likely than others to be interested in family limitation, they are unlikely to use any contraception.

Specification and measurement of dependent variables. The two variables used as measures of fertility outcomes in this study are the demand for no more children and the adoption of a modern method of contraception. These fertility orientations are viewed as the product of purposive behaviour based on intentions and decision-making power. The first outcome variable – the demand for no more children – has been constructed by using information on fertility preferences that were stated at the time of the survey. It is measured as a dichotomous variable coded '1' for 'no more children responses' and '0' for 'other responses'. The second dependent variable – the adoption of a modern method of family planning – has been constructed by using information on responses about methods of contraception that were employed by respondents at the time of the survey. The DHS question asking for the type of contraceptive method that was used at the time of the survey offered the following choices for responses: (0) no method, (2) traditional method, and (3) modern method. In this perspective, the second outcome variable is also measured as a dummy variable coded '1' for current use of a modern method of contraception and '0' otherwise.

The two dependent variables under investigation in this study describe two different aspects of reproduction that are likely to respond differently to variations in spouses' socioeconomic characteristics. Records on the demand for no more children and on contraceptive practice deserve to be given special attention in fertility research

Table 1. Cross-country variations in data completeness due to substantive criteria

Country	DHS sample size	Variations in DHS sample size due to substantive criteria		Variations in the number of children born in the last 5 years before the survey due to substantive criteria	
		DHS respondents who were married at the time of the survey	DHS respondents who were not pregnant at the time of the survey	Total number of children born to all DHS respondents	Total number of children born to DHS respondents who were married at the time of the survey
Mali (1995–96)	9704	8065	8348	10,264	9812
Burkina F. (1992–93)	6354	5096	5735	5828	5651
Niger (1992)	6503	5232	5725	6899	6558
Nigeria (1990)	8781	6696	7865	7902	7600
Cameroon (1991)	3871	2737	3487	3350	2978
Benin (1996)	5491	4264	4883	5180	5004
Senegal (1992–93)	6310	4450	5676	5645	5288
Ghana (1993)	4562	3204	4193	3776	3427
Central Afr. Rep. (1994–95)	5884	4057	5230	4737	4005
Kenya (1993)	7540	4583	6927	6115	5190
Zambia (1992)	7060	4467	6177	6299	5339
Zimbabwe (1994)	6128	3777	5610	4090	3503
Namibia (1992)	5421	2297	4976	3916	2343
Rwanda (1992)	6551	3698	6003	5510	4847

because fertility orientations must start to change before a decline in birth rate becomes a realistic expectation. A better understanding of the determinants of these two aspects of fertility choices is thus expected to provide an interesting perspective on the nature of the causal dynamics that determine childbearing processes in the sub-Saharan region.

Specification and measurement of independent variables. Consistent with the human capital theory, socioeconomic characteristics that are likely to emerge as significant predictor variables are measured by the following factors: wife's education, husband's education, wife's employment, and husband's occupation in the modern economy. These socioeconomic attributes are likely to be conducive to lower fertility because they allow women to escape the framework of life determined by kinship norms and traditional beliefs and to give more priority to activities that emphasize individual advancement (Kirk, 1996; Caldwell, 1980, 1982). The underlying reasoning here is the assumption that women with high levels of socioeconomic resources have high levels of personal autonomy and decision-making power in the household, and a great ability to question and/or break traditions that underpin or foster pronatalist orientations. Advanced schooling for both wives and husbands, for example, is a strong predictor of changes in attitudes and lifestyle. The more education a woman has, the more she will see herself as equal to her husband, able to make family decisions on her own and to undertake actions which might increase her own welfare and that of the family. Under these circumstances, these women are more likely than others to choose to limit the size of the family and/or to use a modern method of contraception. The level of education of each spouse is included in the analysis as a dummy variable used in the following format: zero years of education, 1–6 years of schooling, and 7 or more years of schooling. DHS information on single years of schooling for each spouse was used to create these variables. The variable 'zero years of schooling' is used as the reference category for each spouse.

Wife's employment is measured as a dichotomous variable coded '1' if a woman was working for cash and away from home at the time of the survey and '0' otherwise. Market employment is believed to be associated with reduced motivation for children because it is expected to increase the economic value of women's time. Presumably, should opportunities for women's market employment increase, the cost of having children will be felt by women who have the ability to pursue such an activity (Palmer, 1991), and fertility aspirations will be adjusted downward. Employment in the market sector of the economy can also bring women into contact with new role models and provide them with knowledge of women with small family size and increased exposure to modern family planning. Access to new ideas and values, in addition to breeding motivation for low fertility, enhances women's sense of self-worth and autonomy. This viewpoint suggests that motivations for low fertility may arise out of communication with other people and other ideas. Fertility behaviour, like all behaviours, is in large part determined by the information received, processed, and then acted upon. The people with whom, and the ideas with which, women interact in the workplace shape their existence and attitudes as social creatures.

The role of husband's occupation in the wage economy is also investigated because this attribute is expected to indicate the impact of African men's exposure to

the rigors and pressures of the modern economy on couple's fertility orientations. Occupation is measured as a dummy variable coded '1' if a woman's husband or partner works for wage or independent income in the modern economy, and '0' otherwise. It is assumed that a woman's status is influenced by the position of her husband in the productive process and earnings structure of the society. The underlying hypothesis here is that a woman married to a man who holds a job in the modern economy (managerial, professional, technical, and/or clerical occupations) is more likely than other women to state a preference for no more children and/or to adopt a modern method of family planning. An occupation in the modern economy is likely to operate as a proxy for the level of the adoption of 'middle class values' in couples' and households' lives. It is assumed that aspirations for individual advancement and a greater sensitivity to pressures of modern life, e.g. costs of children, are factors that mediate the relationship between the occupation of the husband and wife's fertility aspirations.

The variables 'wife's urban residence', 'age', 'parity' and 'ethnicity' are included as statistical controls in this study. The effect of wife's urban residence is examined because urban life (e.g. greater exposure to mass media, easier access to family planning services, greater exposure to pressures of modern life) is expected to exert a stronger influence on fertility preferences and the adoption of family planning practices. Urban residence is included in the analysis as a dichotomous variable coded '1' if a woman was living in an urban area at the time of the survey, and '0' otherwise. Living in an urban area would affect a woman's fertility orientations by influencing her values, how she values and/or spends her time, and how she views cultural assumptions about children and childbearing. Fertility levels are higher in rural areas for several reasons. While the social environment is substantially less hostile to reproduction (e.g. free childcare from the extended family, easy access to kinship-based care-giving resources, no pressure for child schooling), large families are useful for the labour power provided by children.

A woman's fertility goals will depend on the stage of her reproductive career, as indicated by her age and the number of living children she has. These two demographic factors are included in the analysis as continuous variables. As women grow older, their fertility motivation declines. Age may reduce older women's fertility aspirations because they may have competing uses for their time, such as fieldwork, housework, market time and multiple social obligations. Moreover, fertility motivation should decrease with age because status and autonomy vary over the life course. Social status increases with age, as the number of people superior to a woman in the family hierarchy decreases. On the other hand, couples who have large numbers of surviving children are more likely than others to be openly concerned about the costs of children, to discuss family planning, and to agree on a small family size.

Each African country covered by this study is a vast land area containing within its boundaries a large number of ethnic groups. Ethnic identity is expected to determine fertility aspirations by shaping a woman's belief and value orientations. This hypothesis is based on the premise that human behaviour is not understandable apart from the broader social context within which that behaviour occurs. In other words, behaviours are not determined by instincts, but by socially organized institutions and assumptions. Ethnicity is an important factor to consider in fertility

research because cultural forces that define gender roles and women's attitudes towards reproduction and family size operate within the boundaries of cultural communities (Lesthaeghe & Eelens, 1989; Adepoju, 1994; Benefo, 1995; Ezeh, 1997). This is a reasonable way to examine the relevance of Mason's (1992) claim that the extent to which advanced education translates into a lowering in fertility motivation depends upon the extent to which the kinship structure allows educated women to exercise control over important dimensions of their lives. Ethnicity effects are included in the analysis as dummy variables. These variables were created by coding '1' a category representing a woman's ethnic group membership in each national DHS survey, and '0' otherwise.

Methods

With two dichotomous outcome variables, logistic regression was used to estimate two nested models for each country covered by the study. The statistical software STATA (StataCorp, 1997) was employed to carry out this task. Logistic regression estimates the log of the odds of the outcome occurring, in terms of a vector of independent variables, and an error term, taking the general form:

$$\ln(Y) = a + b_1X_1 + b_2X_2 + \ldots + b_nX_n$$

where $\ln(Y)$ represents the natural logarithm of the odds of the outcome; a is the intercept; and b_1, b_2, etc. are the coefficients associated with each predictor variable. The resulting coefficients can be interpreted for their magnitude, significance and direction, and transformed through exponentiation to yield odds ratios that indicate the magnitude of the variable's impact on the probability of the outcome occurring. In this study, the odds ratios are presented to indicate whether variations in the level of each independent (explanatory) variable increase or lessen a woman's chance of either adopting modern contraception or stating a preference for no more children. Odds ratios greater than 1 indicate an increased chance of the outcome occurring; those less than unity signify a decreased chance, and those equal to unity suggest a lack or an absence of relationship. For covariates included as continuous variables, the odds ratios measure the amount of change (e.g. the amount of percentage change) in the outcome variable per unit change in those covariates or explanatory variables.

The same independent variables were employed in each model to facilitate comparisons. Model 1 tests for the net effects of the following covariates: wife's education, wife's employment, husband's occupation, wife's urban residence, wife's age, the number of living children, and wife's ethnic identity. Model 2 introduces a control for the separate role of husband's education.

Results and discussion

The results of the multivariate analysis along with the chi-square statistics describing the statistical usefulness of each model are presented in Tables 2–4. It can be said with confidence that the regression models are statistically sound and different from the null model because most chi-square values are large enough to be statistically

https://doi.org/10.1017/S0021932001004813 Published online by Cambridge University Press

Table 2. Logit regression results (presented as odds ratios) on the impact of spouses' education on the demand for no more children and the adoption of modern contraception among currently married and non-pregnant women in sub-Saharan Africa[a]

	Primary education and the demand for no more children			Primary education and the adoption of modern contraception		
	Net effect of wife's education	Net effect of the education of each spouse		Net effect of wife's education	Net effect of the education of each spouse	
Country		Wife's education	Husband's education		Wife's education	Husband's education
Mali	0·81	1·00	0·81	6·37***	3·18***	1·30
	(22·58)	(2178·55)	(2178·55)	(409·38)	(666·01)	(666·01)
Burkina Faso	1·22	1·49**	1·18	5·82***	2·65***	1·65**
	(3·33)	(1608·52)	(1608·52)	(432·21)	(662·44)	(662·44)
Niger	1·09	1·21	1·03	5·37***	2·15***	1·95**
	(0·89)	(891·97)	(891·97)	(255·74)	(572·26)	(572·26)
Nigeria	1·81***	1·43**	1·17	4·87***	2·09***	2·12***
	(54·06)	(1530·14)	(1530·14)	(306·11)	(566·39)	(566·39)
Cameroon	1·53**	1·16	1·04	4·30***	1·77*	1·98
	(8·57)	(421·93)	(421·93)	(104·39)	(212·00)	(212·00)
Benin	0·87	1·13	1·06	3·93***	2·39***	1·78*
	(7·21)	(1422·21)	(1422·21)	(71·02)	(119·26)	(119·26)
Senegal	1·19	1·84***	1·16	6·75***	3·17***	2·02**
	(17·94)	(1251·61)	(1251·61)	(262·08)	(474·92)	(474·92)
Ghana	1·23	1·36	1·00	3·59***	3·40***	1·07
	(3·72)	(1056·84)	(1056·84)	(124·16)	(190·78)	(190·78)
Central Afr. Rep.	0·84	0·96	0·66**	3·86***	2·33**	0·75
	(2·53)	(688·20)	(688·20)	(109·04)	(231·32)	(231·32)
Kenya	0·87	1·14	1·41**	1·66***	1·70***	1·06
	(15·78)	(1088·09)	(1088·09)	(180·06)	(673·59)	(673·59)
Zambia	0·63***	0·86	1·26	1·59*	1·23	0·74
	(29·68)	(1190·88)	(1190·88)	(183·22)	(379·79)	(379·79)
Zimbabwe	1·02	1·29	0·97	1·62***	1·41***	1·25
	(88·49)	(1183·72)	(1183·72)	(128·30)	(430·27)	(430·27)
Namibia	0·66**	0·77	0·92	1·06	0·95	1·23
	(11·97)	(320·10)	(320·10)	(217·08)	(600·43)	(600·43)
Rwanda	0·65***	0·90	1·06	1·23	1·29*	1·19
	(76·79)	(1208·55)	(1208·55)	(30·09)	(153·79)	(153·79)
Average	1·03	1·18	1·05	3·72	2·12	1·44

[a]Chi-square statistics for each model are placed in parentheses.
*$P<0·05$; **$P<0·01$; ***$P<0·001$.

https://doi.org/10.1017/S0021932001004813 Published online by Cambridge University Press

Table 3. Logit regression results (presented as odds ratios) on the impact of spouses' education on the demand for no more children and the adoption of modern contraception among currently married and non-pregnant women in sub-Saharan Africa[a]

	Post-primary education and the demand for no more children			Post-primary education and the adoption of modern contraception		
	Net effect of wife's education	Net effect of the education of each spouse		Net effect of wife's education	Net effect of the education of each spouse	
Country		Wife's education	Husband's education		Wife's education	Husband's education
Mali	1·73***	1·78**	1·31	16·99***	4·58***	2·61***
	(22·58)	(2178·55)	(2178·55)	(409·38)	(666·01)	(666·01)
Burkina Faso	1·04	1·91**	1·65*	15·58***	5·08***	2·00
	(3·33)	(1608·52)	(1608·52)	(432·21)	(662·44)	(662·44)
Niger	1·24	1·35	1·14	20·81***	5·45***	1·76*
	(0·89)	(891·97)	(891·97)	(255·74)	(572·26)	(572·26)
Nigeria	1·37**	1·44*	1·67***	11·04***	4·26***	2·28***
	(54·06)	(1530·14)	(1530·14)	(306·11)	(566·39)	(566·39)
Cameroon	1·31	1·75	1·10	10·77***	4·42***	2·56*
	(8·57)	(421·93)	(421·93)	(104·39)	(212·00)	(212·00)
Benin	1·47*	2·30**	1·20	6·39***	2·40**	2·86***
	(7·21)	(1422·21)	(1422·21)	(71·02)	(119·26)	(119·26)
Senegal	2·00***	3·15***	1·11	19·24***	6·11***	3·09***
	(17·94)	(1251·61)	(1251·61)	(262·08)	(474·92)	(474·92)
Ghana	1·12	1·46**	1·33*	4·97***	4·45***	1·42*
	(3·72)	(1056·84)	(1056·84)	(124·16)	(190·78)	(190·78)
Central Afr. Rep.	1·05	1·08	1·08	12·57***	4·11***	1·67
	(2·53)	(688·20)	(688·20)	(109·04)	(231·32)	(231·32)
Kenya	0·73***	1·45**	1·13	3·22***	2·95***	1·83***
	(15·78)	(1088·09)	(1088·09)	(180·06)	(673·59)	(673·59)
Zambia	0·59***	1·23	1·29	6·24***	3·14***	1·49
	(29·68)	(1190·88)	(1190·88)	(183·22)	(379·79)	(379·79)
Zimbabwe	0·51***	1·50**	0·94	2·90***	2·03***	1·52**
	(88·49)	(1183·72)	(1183·72)	(128·30)	(430·27)	(430·27)
Namibia	0·95	1·08	1·24	4·77***	2·67***	1·82**
	(11·97)	(320·10)	(320·10)	(217·08)	(600·43)	(600·43)
Rwanda	0·38***	1·04	1·59*	2·12***	1·98***	1·66**
	(76·79)	(1208·55)	(1208·55)	(30·09)	(153·79)	(153·79)
Average	1·11	1·60	1·27	9·83	3·83	2·04

[a]Chi-square statistics for each model are placed in parentheses.
*$P<0·05$; **$P<0·01$; ***$P<0·001$.

https://doi.org/10.1017/S0021932001004813 Published online by Cambridge University Press

Table 4. Logit regression results (presented as odds ratios) predicting the demand for no more children and the adoption of modern contraception among currently married and non-pregnant women in sub-Saharan Africa[a]

	Net effects on the demand for no more children				Net effects on the adoption of modern contraception			
Country	Wife's work	Husband's work	Wife's age	Wife's parity	Wife's work	Husband's work	Wife's age	Wife's parity
Mali	1·15	1·28*	1·13**	1·49***	1·44**	2·49***	0·98*	1·22***
Burkina Faso	1·30**	1·20	1·11***	1·61***	1·31*	1·38*	0·97**	1·27***
Niger	1·30*	1·48**	1·14***	1·31***	1·00	1·35	0·96**	1·31***
Nigeria	1·27*	1·38**	1·11***	1·45***	1·41**	1·47*	1·02*	1·24***
Cameroon	0·96	1·23	1·04***	1·55***	1·24	1·38	1·02	1·30***
Benin	0·97	1·31*	1·13***	1·62***	0·83	1·18	1·01	1·11
Senegal	0·96	0·93	1·11***	1·57***	1·09	2·93***	1·00	1·31***
Ghana	0·94	1·20	1·04***	1·96***	1·00	1·21	0·98	1·25***
Central Afr. Rep.	0·90	0·97	1·04***	1·60***	0·72	2·15**	0·98	1·36***
Kenya	1·11	1·08	1·02**	1·52***	1·40***	1·26**	1·00	1·22***
Zambia	1·16	0·94	1·09***	1·47***	1·55***	1·19	1·00	1·18***
Zimbabwe	1·26*	1·08	1·03***	1·76***	1·54***	1·23*	0·92***	1·31***
Namibia	1·14	1·00	1·03**	1·29***	1·09	1·27	0·96***	1·28***
Rwanda	0·94	0·83	1·06***	1·67***	0·95	1·67***	0·97**	1·28***
Average	1·10	1·14	1·08	1·56	1·18	1·58	0·98	1·26

[a]Chi-square statistics for the full model on the demand for no more children and the full model on the adoption of modern contraception are the same as those presented for the full model on the demand for no more children and the full model on the adoption of modern contraception in Table 3.

*P<0·05; **P<0·01; ***P<0·001.

significant. While Table 2 shows regression results measuring the net effects of primary education for each spouse, Table 3 presents regression results describing the net effects of post-primary schooling for each spouse. Table 4 presents the net effects of variables measuring wife's work, husband's work, wife's age and wife's parity on whether fertility limitation is wanted and on whether a modern method of contraception is used. All regression coefficients are presented as odds ratios. The net effect of the covariate 'urban residence' is not shown for the simple reason that it predicts significantly substantial increases in levels of both the demand for no more children and the adoption of a modern method of contraception in the majority of the countries covered by the study.

The data presented in Table 2 show that a few years of education obtained by each spouse do little to diminish fertility aspirations in sub-Saharan Africa. On average (see the average row), for all the fourteen countries examined in the study, in comparison with zero years of schooling, wife's primary education predicts a 3% increase in the demand for no more children and a 272% increase in contraceptive use. This relationship is altered once a control is made for husband's education as follows: while the average odds ratio for wife's primary education increases from 1·03 to 1·18 for the demand for no more children, it decreases from 3·72 to 2·12 for the adoption of modern family planning. This finding shows that it is hard for a wife with only a few years of schooling to wish to discontinue childbearing without the support of a husband with some education. The reduction of the net effect of wife's primary education on contraceptive use indicates that, at a low level of education, the impact of a married woman's schooling in the adoption of modern family planning is made up of two net effects: the net effect of the education of the wife, and the net effect of the education of the husband. However, controlling for the level of schooling of the husband does little to undermine the familiar observation that wife's schooling matters more than husband's in the adoption of modern family planning in developing countries. Other insights that emerge from these results include the following. First, there are enormous cross-country differences in the relationship between primary education and fertility choices. Second, while its relationship to the demand for no more children is mixed and uncertain, primary education does little to make it possible for a married woman to use a modern method of contraception. These results might be suggesting that small amounts of education have little or no effect on fertility desires in most sub-Saharan societies. This means that it may take a great deal of schooling for the classic positive relationship between education and the demand for no more children to show up in those societies (Jejeebhoy, 1995).

The impact of post-primary education obtained by each spouse on fertility behaviour is stronger and demonstrates that a large amount of schooling is indeed needed for education to translate into greater use of contraception in Africa south of the Sahara. Table 3 shows that women with secondary or more schooling are significantly more likely to adopt modern family planning once such covariates as their employment, their age, their parity or the number of living children they have, their residence in an urban area, their ethnicity, and their husband's occupation are controlled. On average (see the average row at the bottom), for all the fourteen countries examined in the study, compared with zero years of schooling, wife's post-primary education predicts a 11% increase in the demand for no more children

and an 883% increase in the adoption of a modern method of contraception. This relationship is altered once a control is made for husband's education as follows: while the average odds ratio for wife's post-primary education increases from 1·11 to 1·60 for the demand for no more children, it dramatically decreases from 9·83 to 3·83 for the adoption of modern family planning. These findings add to the evidence from sub-Saharan Africa that men exert a great deal of influence on both wives' fertility preferences (Gage & Njogu, 1994; Ezeh, 1993; Frank & McNicoll, 1987; Caldwell & Caldwell, 1987) and their behaviour (Bankole, 1995; Buor, 1996). Moreover, as highlighted in the table, the reduction in the magnitude of the net effect of wife's post-primary education on contraceptive use indicates that the impact of female schooling on the adoption of modern family planning is indeed made up of two net effects: the effect of the education of the wife, and that of the education of the husband.

However, the fact that controlling for husband's education does not eliminate the evidence that wife's post-primary education is a significant predictor of contraceptive use, after removing the effects of other relevant covariates, suggests that a wife's schooling is more important than a husband's in the adoption of modern family planning across the African region. This finding demonstrates that post-primary schooling is a critical factor in fertility change and that highly educated women have the power to overcome cultural norms that prevent large numbers of African women from making independent decisions about child bearing and the spacing of births. This evidence provides strong support for the claim that a woman's advanced education leads to deliberate and volitional changes in her reproductive choices.

Additional information concerning factors that are associated with the observed variations in fertility choices in sub-Saharan Africa is presented in Appendix 1 and Table 4. Levels of ethnic differences in fertility orientations highlighted in Appendix 1 indicate that sub-Saharan societies vary considerably among themselves in their levels of pronatalism. On the other hand, Table 4 indicates that the strongest and most consistent factor predicting whether family limitation is desired or whether modern contraception is used is wife's parity, that is, the number of living children a married woman has. This variable predicts significantly substantial increases in these two fertility processes in all the countries that are covered by the study. While the average odds ratio is 1·56 for the demand for no more children, it is 1·26 for the use of a modern method of contraception. The weak nature of the relationship between wife's age and contraceptive use is likely to be showing that in the sub-Saharan region, using modern contraception for spacing children is mostly appealing to younger women who are concerned with postponing the next birth (Guilkey & Jayne, 1997, p. 183). Alternatively, it may be that the contraceptive methods that are available are less appropriate for older women, who are probably more concerned with stopping childbearing. On the other hand, while the employment status of each spouse is irrelevant to a woman's ability to develop a desire for family limitation in contemporary sub-Saharan Africa, there is a tendency for this attribute to be positively and significantly associated with the adoption of modern contraception in the continent. While the average odds ratio for the net effect of wife's employment on contraceptive is 1·l8, that of husband's occupation is 1·58. Although these effects are not significant for all the study countries, they indicate the extent to which working

for cash and away from home constitutes an important channel through which exposure to pressures of modern life in the workplace contributes to the adoption of modern contraception in Africa south of the Sahara.

The results presented in Tables 2–3 show that formal education leads to more favourable fertility outcomes in least developed countries such as Mali and Niger in comparison with more advanced countries such as Ghana, Cameroon, Kenya and Zimbabwe. This intriguing scenario is due to the type of data being used. The DHS materials used in this study are cross-sectional data. In such cases, one can always expect greater effects in least developed or more traditional national settings. There is logical reasoning behind this thinking. Regression slopes are steeper when only a few pioneers (a few women) have the social status that allows them to adopt a new idea such as family limitation or a new product such as a modern method of contraception. The relationship between formal education and fertility is likely to be different when considered longitudinally. This viewpoint suggests that while a cross-sectional correlation may be very strong in a least developed society, there is no guarantee that that relationship will expand and translate into fertility transition within the boundaries of that society. Conversely, a weak cross-sectional relationship may be found in national settings that are more developed and/or more egalitarian because regression coefficients are smaller when numbers of women with high social status and a smaller fertility motivation are large. The difference is that further improvements in levels of socioeconomic development and female status are likely to lead, over time, to a lowering in fertility motivation and, subsequently, to fertility transition within the boundaries of more developed and more secularized countries.

Conclusion

The results obtained in this study offer strong support for the widely held belief that improvements in women's education are associated with more favourable fertility decisions in the developing world by enhancing their decision-making autonomy and by expanding their ability to pursue goals other than childbearing. The relevance of this viewpoint is seen in the evidence that the role of wife's education is clearly predominant in the adoption of modern family planning, which may reduce fertility. The weakness or uncertainty associated with the role of wife's education in the determination of the demand for family limitation is consistent with the assumption that fertility motivation is still strong in Africa south of the Sahara (Caldwell, 1982; Caldwell & Caldwell, 1987; Frank & McNicoll, 1987; Frank, 1987; Lesthaeghe, 1989) and that husbands exert substantial influence on wives' fertility choices. The fact that a few years of education are weakly correlated with the adoption of modern contraception underscores the reality that, in contemporary sub-Saharan Africa, it takes a great deal of schooling for a married woman to have the amount of autonomy that makes it possible for her to openly use family planning.

The evidence describing the role of formal schooling in fertility determination shows that while the level of schooling of the husband plays a non-negligible role in the relationship between wife's education and contraceptive use in all the countries examined in the study, it does little to diminish the strength of the familiar positive relationship between wife's education and contraceptive use. Formal education

promotes the use of modern contraception by increasing the degree of communication between spouses over issues relating to couples' emotional needs and child costs. Spouses who are educated and who like each other more are more likely to desire increased coital frequency and, subsequently, they are very likely to do a better job of communicating with each other about contraception than spouses who have a more distant relationship. The finding that the use of effective methods of contraception depends on both the wife's and the husband's education, but more on the wife's, is consistent with Shapiro & Tambashe's (1992) and Wamucii's (1990) work, which found that the level of schooling of the wife has a strong net positive effect on contraceptive use in sub-Saharan Africa. Such a finding, however, appears to contradict Djamba's (1993) study, which demonstrated that husband's education is more important than wife's education in the adoption of modern family planning in Kinshasa, Zaire.

Several policy conclusions emerge from this study. Above all, the results argue strongly for sustained investment in women's education and, specifically, in ensuring universal enrolment and attendance for girls. The chief policy implication of the study might be that of expanding educational opportunities for women in order to increase their aspirations for individual advancement and their decision-making autonomy, that is, their ability to make decisions on their own and to act upon those decisions. For institutions interested in speeding up the process of change in women's lives and reproductive practices in Africa south of the Sahara, the best avenues for doing so are those already known in the development community: investment in primary and secondary education, promotion of gender equity in access to education, and the setting in place of policies that would stimulate economic growth and job creation. The findings (Appendix 1) also suggest that population and fertility policies that are set up from national-level analyses in sub-Saharan countries would be inappropriate if they do not take ethnicity into account. The relevance of this viewpoint for family planning programmes resides in the fact that ethnic identity plays an important role in women's decision-making autonomy and in their fertility orientations (Kritz, Makinwa-Adebusoye & Gurak, 1997; Mason, 1992). The strength of ethnicity effects indicates that ideas and attitudes about women's roles in society and about childbearing are deeply rooted in some cultures and that these attitudes have to change for a decline in the motivation for children to occur.

References

Acsadi, G. T. F. & Johnson-Acsadi, G. (1990) Demand for children and childspacing. In: *Population Growth and Reproduction in Sub-Saharan Africa: Technical Analyses of Fertility and its Consequences*, pp. 155–185. Edited by G. T. F. Acsadi, G. Johnson-Acsadi & R. A. Bulatao. The World Bank, Washington, DC.

Adepoju, A. (1994) *Rethinking the Approaches to the Study of Population Dynamics in Africa*. Occasional Paper No. 1, Union for African Population Studies, Dakar, Senegal.

Bankole, A. (1995) Desired fertility and fertility behaviour among the Yoruba of Nigeria: A study of couple preferences and subsequent fertility. *Popul. Stud.* **49**, 317–328.

Becker, G. S. (1981) *A Treatise on the Family*. Harvard University Press, Cambridge, Massachusetts.

BENEFO, K. D. (1995) The determinants of the duration of postpartum sexual abstinence in West Africa: a multilevel analysis. *Demography* **32**(2), 139–158.

BUOR, D. (1996) Reproductive decision-making in a changing Ghanaian family. In: *The Changing Family in Ghana*, pp. 42–63. Edited by E. Ardayfio-Schandorf. Ghana University Press, Accra.

CALDWELL, J. C. (1980) Mass education as a determinant of the timing of fertility decline. *Popul. Dev. Rev.* **6**, 2.

CALDWELL, J. C. (1982) *Theory of Fertility Decline*. Academic Press, London/New York.

CALDWELL, J. C. & CALDWELL, P. (1987) The cultural context of high fertility in sub-Saharan Africa. *Popul. Dev. Rev.* **13**(3), 409–437.

COCHRANE, S. H. (1979) *Fertility and Education: What Do We Really Know?* Johns Hopkins University Press, Baltimore.

COCHRANE, S. H. (1983) Effects of education and urbanization on fertility. In: *Determinants of Fertility in Developing Countries*, Vol. 2, *Fertility Regulation and Institutional Influences*. Edited by R. A. Bulatao & R. D. Lee. Academic Press, New York.

COCHRANE, S. H. & FARID, S. (1990) Socioeconomic differentials in fertility and their explanation. In: *Population Growth and Reproduction in Sub-Saharan Africa: Technical Analyses of Fertility and its Consequences*, pp. 144–154. Edited by G. T. F. Acsadi, G. Johnson-Acsadi & R. A. Bulatao. The World Bank, Washington, DC.

DJAMBA, Y. K. (1993) Spouses' sociodemographic characteristics and contraceptive use in Kinshasa, Zaire. *Afr. Popul. Stud.* **8**, 58–72.

EZEH, A. (1993) The influence of spouses over each other's contraceptive attitudes in Ghana. *Stud. Fam. Plann.* **24**, 163–174.

EZEH, A. C. (1997) Polygyny and reproductive behavior in sub-Saharan Africa: a contextual analysis. *Demography* **34**(2), 355–368.

FRANK, O. (1987) The demand for fertility control in sub-Saharan Africa. *Stud. Fam. Plann.* **18**, 4.

FRANK, O. & MCNICOLL, G. (1987) An interpretation of fertility and population policy in Kenya. *Popul. Dev. Rev.* **13**(2), 209–243.

GAGE, A. J. & NJOGU, W. (1994) *Gender Inequalities and Demographic Behavior*. The Population Council, New York.

GUILKEY, D. K. & JAYNE, S. (1997) Fertility transition in Zimbabwe: determinants of contraceptive use and method choice. *Popul. Stud.* **51**(2), 173–189.

JEJEEBHOY, S. (1995) *Women's Education, Autonomy, and Reproductive Behavior: Experience from Developing Countries*. Clarendon Press, Oxford.

KASARDA, J. D., BILLY, J. & WEST, K. (1986) *Status Enhancement and Fertility: Reproductive Responses to Social Mobility and Educational Opportunity*. Academic Press, New York.

KIRK, D. (1996) Demographic transition theory. *Popul. Stud.* **50**(3), 361–387.

KONDE, E. (1992) *Reconstructing the Political Roles of African Women: A Postrevisionist Paradigm*. Working Papers in African Studies, No. 161. African Studies Center.

KRITZ, M. M. & GURAK, D. (1989) Women's status, education and family formation in sub-Saharan Africa. *Int. Fam. Plann. Perspect.* **15**(3), 100–105.

KRITZ, M. M., MAKINWA-ADEBUSOYE, P. & GURAK, D. T. (1997) The role of empowerment context in shaping reproductive behavior in Nigeria. Revised version of a paper presented at the *Seminar on Female Empowerment and Demographic Processes: Moving Beyond Cairo*. Organized by the IUSSP Committee on Gender and Population in collaboration with the Department of Sociology of the University of Lund, Lund, Sweden.

LESTHAEGHE, R. J. (1989) Production and reproduction in sub-Saharan Africa: an overview of organizing principles (and Introduction). In: *Reproduction and Social Organization in*

Sub-Saharan Africa. Edited by R. J. Lesthaeghe. University of California Press, Berkeley, London.

Lesthaeghe, R. J. & Eelens, F. (1989) The components of sub-Saharan reproductive regimes and their social and cultural determinants: empirical evidence. In: *Reproduction and Social Organization in Sub-Saharan Africa*. Edited by R. J. Lesthaeghe. Univertsity of California Press, Berkeley, London.

Lloyd, C. B., Kaufman, C. & Hewett, P. (1998) Education transitions in sub-Saharan Africa: implications for fertility change. Paper presented at the *IUSSP Seminar on Reproductive Change in Sub-Saharan Africa*. Population Council, Nairobi, Nov. 2–4.

Mason, K. O. (1992) The impact of women's position on demographic change during the course of development: what do we know? In: *Women's Position and Demographic Change*. Edited by N. Federici, K. O. Mason & S. Sogner. Oxford University Press, Oxford.

Ominde-Odhiambo (1997) Men's participation in family planning decisions in Kenya. *Popul. Stud.* **51**(1), 29–40.

Palmer, L. (1991) *Gender and Population in the Adjustment of African Economies: Planning for Change*. ILO, Geneva.

Schultz, T. P. (1976) Determinants of fertility: a micro-economic model of choice. In: *Economic Factors in Population Growth*. Edited by A. J. Coale. Wiley, New York.

Shapiro, D. & Tambashe, O. (1992) Employment, education, and fertility behavior in Kinshasa: some preliminary evidence. *Afr. Popul. Stud.* **7**, 1–27.

StataCorp (1997) *Stata Statistical Software, Release 5·0, User's Guide*. Stata Corporation, College Station, TX.

van de Walle, E. & Foster, A. D. (1990) Fertility decline in Africa: assessment and prospects. In: *World Bank Technical Paper 125, Africa Technical Department Series*. The World Bank, Washington, DC.

Wamucii, N. (1990) Trends and determinants of contraceptive use in Kenya. *Demography* **28**(1), 83–97.

Appendix

Table A1. Ethnic differences in levels of the demand for no more children and the adoption of modern contraception and net effect of ethnic identity on fertility choices in sub-Saharan Africa

	Ethnic differences in levels of fertility choices		Logit regression results (presented as odds ratios) predicting the effect of ethnic identity on fertility choices (Model 2 or Full Model)	
Country and ethnic group	Prevalence of the demand for no more children	Prevalence of the adoption of modern contraception	Demand for no more children	Adoption of modern contraception
Mali				
Bambara	0·19	0·05	1·69***	1·41
Malinke	0·14	0·10	1·01	1·65*
Peul	0·16	0·05	1·20	0·98
Sarakole	0·15	0·04	1·24	0·99
Sonrai	0·14	0·08	0·85	0·73
Dogon	0·19	0·01	1·86**	0·19**
Tamashek	0·11	0·02	0·75	0·30*
Senufo	0·14	0·05	1·04	1·28
Bobo	0·17	0·02	1·44	0·62
Burkina Faso				
Bobo	0·17	0·08	1·01	0·92
Dioula	0·14	0·06	0·86	0·85
Peul	0·13	0·02	0·70	0·57
Gourmanthe	0·16	0·04	1·16	1·04
Gourousi	0·15	0·06	0·78	1·18
Lobi	0·15	0·11	0·93	1·30
Mossi	0·17	0·07	1·03	1·13
Senufo	0·18	0·12	0·88	1·51
Touareg	0·06	0·01	0·62	1·36
Niger				
Djerma	0·09	0·08	0·68	2·11**
Gourmanthe	0·06	0·06	0·84	4·41*
Haoussa	0·08	0·03	0·48**	1·04
Kanouri	0·13	0·03	1·37	0·63
Mossi	0·00	0·00	—	—
Peul	0·10	0·06	0·69	2·20*
Touareg-bella	0·07	0·02	0·42**	1·00
Toubou	0·10	0·13	1·90	0·92
Nigeria				
Pidgin	0·21	0·10	1·65	1·04
Hausa	0·08	0·01	0·54***	0·60*
Yoruba	0·15	0·10	0·84	0·97

https://doi.org/10.1017/S0021932001004813 Published online by Cambridge University Press

Appendix *Continued*

Country and ethnic group	Ethnic differences in levels of fertility choices		Logit regression results (presented as odds ratios) predicting the effect of ethnic identity on fertility choices (Model 2 or Full Model)	
	Prevalence of the demand for no more children	Prevalence of the adoption of modern contraception	Demand for no more children	Adoption of modern contraception
Nigeria *continued*				
Igbo	0·13	0·03	0·70*	0·50**
Efik	0·17	0·04	0·96	—
Kanuri	0·05	0·00	0·70*	0·30**
Tiv	0·16	0·05	0·62	—
Cameroon				
Fulfulde (Peul)	0·02	0·04	0·77	1·25
Ewondo	0·06	0·01	1·10	1·83
Pidgin	0·09	0·04	1·65	2·11
Benin				
Adja	0·18	0·02	0·94	0·92
Bariba	0·11	0·02	0·36**	1·37
Dendi	0·16	0·03	0·94	1·26
Fon	0·24	0·05	1·56	1·48
Yoa	0·13	0·02	0·48*	0·82
Betamaribe	0·13	0·02	0·53*	0·95
Peul	0·14	0·01	0·35**	0·77
Yoruba	0·20	0·05	0·79	1·82
Senegal				
Wolof-Lebou	0·14	0·05	1·17	0·54*
Poular	0·16	0·03	1·59	0·48*
Serer	0·15	0·04	0·93	0·53
Mandingue	0·10	0·05	0·62	0·44
Diola	0·11	0·07	0·79	0·33*
Bambara	0·20	0·21	1·88	1·22
Sarakole	0·15	0·05	1·12	0·45
Ghana				
Ashante	0·25	0·09	1·63	1·09
Akwapim	0·24	0·12	1·47	1·34
Fanti	0·24	0·10	1·84	1·64
Other Akan	0·23	0·12	1·21	1·64
Ga· Adangbe	0·26	0·10	2·03*	1·10
Ewe	0·29	0·11	2·25**	1·36
Guan	0·20	0·05	0·93	0·85
Mole-Dagbani	0·17	0·05	0·71	1·77
Grussi	0·19	0·09	1·52	2·40
Gruma	0·16	0·03	0·68	1·12
Hausa	0·10	0·10	0·43	2·16

https://doi.org/10.1017/S0021932001004813 Published online by Cambridge University Press

Appendix *Continued*

Country and ethnic group	Ethnic differences in levels of fertility choices		Logit regression results (presented as odds ratios) predicting the effect of ethnic identity on fertility choices (Model 2 or Full Model)	
	Prevalence of the demand for no more children	Prevalence of the adoption of modern contraception	Demand for no more children	Adoption of modern contraception
Central Afr. Rep.				
Haoussa	0·08	0·01	0·23**	0·07*
Sara	0·10	0·04	0·41	0·68
Mboum	0·11	0·02	0·52	0·64
Gbaya	0·10	0·03	0·59	0·48
Mandjia	0·15	0·05	0·85	0·65
Banda	0·12	0·03	0·66	0·41
Ngbaka-bantou	0·12	0·05	0·49	0·33*
Yakoma-sango	0·16	0·04	0·57	0·40
Zande-nzakara	0·09	0·06	0·67	0·84
Kenya				
Kalenjin	0·27	0·14	0·86	1·04
Kamba	0·32	0·19	1·35	0·99
Kikuyu	0·30	0·33	1·61*	2·88***
Kisii	0·24	0·25	0·73	2·60***
Luhya	0·31	0·18	1·11	1·05
Luo	0·25	0·12	0·92	0·62*
Meru-embu	0·37	0·31	2·04**	3·33***
Mijikenda-Swahili	0·14	0·10	0·36***	0·79
Somali	0·24	0·29	0·64	0·81
Taita	0·25	0·21	1·01	1·40
Zambia				
Bemba	0·13	0·07	0·55*	0·36***
Tonga	0·14	0·06	0·58	0·38**
North-Western	0·14	0·06	0·83	0·47*
Baroste	0·08	0·04	0·42**	0·27***
Nyanja	0·16	0·07	0·91	0·37***
Mambwe	0·13	0·07	0·46*	0·34**
Tumbuka	0·15	0·07	0·91	0·32**
Zimbabwe				
Shona	0·29	0·32	0·71	0·45**
Ndebele	0·36	0·25	1·01	0·25***
Namibia				
Afrikaans	0·18	0·45	2·32***	3·97***
Oshivambo	0·06	0·09	0·74	0·52**
Damara-nama	0·21	0·38	4·27***	3·63***
Herero	0·15	0·42	2·43**	2·14**

https://doi.org/10.1017/S0021932001004813 Published online by Cambridge University Press

Appendix *Continued*

Country and ethnic group	Ethnic differences in levels of fertility choices		Logit regression results (presented as odds ratios) predicting the effect of ethnic identity on fertility choices (Model 2 or Full Model)	
	Prevalence of the demand for no more children	Prevalence of the adoption of modern contraception	Demand for no more children	Adoption of modern contraception
Namibia *continued*				
Kwangali	0·12	0·07	1·03	0·49*
Lozi	0·03	0·25	0·20***	0·90
Tswana	0·05	0·48	1·09	4·97
San	0·13	0·15	1·05	1·76
Rwanda				
Hutu	0·21	0·09	3·11	1·31
Tutsi	0·19	0·10	3·38	1·12
Twa	0·14	0·00	2·32	—

*$P<0·05$; **$P<0·01$; ***$P<0·001$.

https://doi.org/10.1017/S0021932001004813 Published online by Cambridge University Press