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The Importance of Ethnicity: Fertility and Ethnicity in West Africa

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Abstract

Africa is often the neglected stepchild of Eurocentric demographic transition theory. The weak nation-state, extended kinship networks and lasting socio-cultural supports for elevated fertility have often challenged demographers. This paper addresses the lack of Africa-specific fertility research, and examines the importance of ethnicity in determining current fertility in West Africa. Utilizing recent DHS surveys, I look at the fertility behavior of ethnic groups spanning more than one country in the region, with current fertility as the dependent variable. I fit models for each country separately in the first analysis, followed by pooled fixed effects models for all countries in the second analysis. The results point to the relative importance of the nation-state rather than ethnicity in determining fertility levels. However, ethnicity is still an important determinant within countries and for certain ethnic groups.

Introduction

West Africa is a region where colonial interests determined national boundaries. As in other regions in Africa, scant attention was paid to the ethno-linguistic composition of nations with ethnic groups divided between countries. However, this is even more acute in West Africa where nations were often delineated from the interior to the coast, whereas ethnic groups were geographically concentrated perpendicularly, according to the climate band (and the ensuing impact upon way of life). In the African setting in particular, a person's primary allegiance is to family, lineage and ethnic group; national identity is often weak (Caldwell and Caldwell, 1987; Weinreb, 2001). Despite the heterogeneous nature of the West African nation state, fertility data are still analyzed according to national demarcation. However, one of the central theories of fertility decline, ideational or diffusion theory, predicts that fertility behavior should be similar in ethno-linguistic groups. Therefore, it is likely that certain ethnic groups are undergoing fertility changes that are being overlooked in national figures.

Historically, fertility transition theory developed out of the European experience, in the 19th and early 20th centuries. Even so, the debate over the cause of fertility decline, and indeed fully explaining any fertility change, has not yet been resolved. Furthermore, the fertility transition in many African countries seems to be delayed or slow, particularly in comparison with many Asian transitions. In sub-Saharan African countries that are showing signs of fertility decline, there are concerns over data quality, as well as deliberations regarding the explanatory sufficiency of these declines and prospects for the future (Agyei-Mensah & Aase 1998). It is possible that due to the heterogeneous nature

of many African countries, there are ethnic groups undergoing more rapid transitions, whereas studies tend to be at the national level (Casterline, 2001). This could be misplaced given the weak nature of the state and the importance of ethnicity in an identity of self. Such a finding would be of profound importance for any analysis or estimations of future fertility trends. It would also contribute to our understanding of the nation-state in Africa and its role (or lack thereof) in social cohesion. Additionally, this study seeks to build upon the concept of ideational theory, comparing homogeneous cultural groups in differing socioeconomic conditions, which would provide a much needed African perspective to a largely Eurocentric framework.

Fertility Decline

The decline in fertility that has been witnessed in so many societies in the world is often termed the fertility transition, implying that each society undergoes a similar process with a clear beginning and an end, and with distinct intermediate stages. The classic fertility transition, as witnessed in European societies, particularly English speaking, is widely attributed to changes in socioeconomic conditions that caused high fertility to be disadvantageous rather than beneficial (Thompson, 1930 & Notestein, 1952) [1]. However, the emphasis on changes in objective structural development levels was misplaced. Although important, the development conditions associated with fertility decline are varied, even in Europe where the classic fertility transition was born, let alone in other regions (Freedman, 1979; Coale & Watkins,1986).

[1] cited in Oppenheim-Mason (1997) ; Caldwell (1976) & McDonald (1993)

As a result of this deficiency, two main approaches developed from the classical fertility transition. One approach is that of adaptation, whereby households and individuals adapt their fertility levels to those required by changing socioeconomic conditions. This has been developed into modern micro-economic theory, with households playing the major role in determining their fertility levels (Becker 1960; Becker & Barro, 1988). Further work, led by Easterlin, developed a theory relating fertility desires to tastes due to relative economic status (Easterlin et al, 1980 & Easterlin, 1976). Another major contributor, Jack Caldwell, looked at the direction of inter-generational wealth flows; his work was innovative in that this theory also takes account of culture (Caldwell, 1982; Caldwell & Caldwell, 1987). It is, in effect, how culture determines the economic rationality of having children. Caldwell (1980) also examined the effect that mass education has on changing the direction of wealth flows, identifying it as one of the crucial factors necessary for fertility decline. However, purely micro-economic explanations are lacking, as they fail to explain why a fertility transition can occur simultaneously amongst all socioeconomic strata of society (McDonald, 1993).

The second main approach is that of diffusion within cultural boundaries. Fertility limitation is initially adopted by an elite group and this behavior spreads throughout a population sharing a common language and culture (not necessarily represented by geographic boundaries). Some researchers have found that cultural factors are focal, which is the main basis of the ideational/diffusion theory (Cleland & Wilson, 1987). The role of social norms in governing fertility decline has also been found to be central (Blake,1968; Lesthaeghe, 1983). Bongaarts and Watkins (1996) observed that once a

country in a certain region entered the fertility transition, it was followed by others at lower levels of development. They attribute this to the macro-level environment channeling the social interactions, which are critical at the level of personal networks, within and across countries.

In this paper, I focus on the effect of ethnicity on fertility in West Africa. Finding a strong ethnic effect after controlling for structural influences, particularly one that traverses national borders, will provide evidence for diffusion or ideational theory. The conceptual model is presented in Figure 1.

Ethnicity and fertility

The fertility of ethnic groups could be influenced by both structural and cultural determinants. As Brunette (1996) points out, it is important not to equate ethnicity with culture; ethnicity is just one element in culture and vice versa. Ethnic groups, particularly in Africa where often one group was designated the favored group and bestowed education and (relative) power by their colonial overlords, differ in their structural assimilation. They have different levels of socioeconomic development, including education, employment opportunities, occupational structure, migratory behavior, mortality levels and housing. All of these are known to affect fertility. Once socioeconomic development passes a threshold level, it has a negative effect on fertility. If this is the case, then controlling for socioeconomic determinants should render insignificant any differences in fertility.

On the other hand, ethnic groups also differ in their socio-cultural characteristics. Undoubtedly, in any society, sexual and reproductive behavior is socially prescribed. As well as directly determining reproductive preferences, other factors that can directly influence fertility and are culturally shaped are, for example, post-partum abstinence, sexual promiscuity, coital frequency, age at first union, extended breastfeeding, sterility and rates of fetal loss. These proximate determinants are of greater significance in the African context, particularly pre-transition countries, where there is little conscious fertility control (Bongaarts et al., 1984). They are shaped by other indirect social determinants such as the lineage system and female autonomy (Derose et al, 2002). Bongaarts and Watkins (1996) stated that patterns of nuptiality and breastfeeding are largely determined by community customs, and thus under social control. Indeed, Bongaarts et al (1984) found that even in pre-transition African societies there were wide variations in fertility, despite very low levels of direct fertility regulation.

If ethnicity itself is an important factor, then it would be expected that once socioeconomic conditions are accounted for, differences in fertility by ethnic group would still remain. Furthermore, if an ethnic group determines culturally led reproductive behavior in West Africa, then there will be more homogeneity among ethnic groups than among national groups. In other words, differences between ethnic groups in different states will be accounted for by structural characteristics. However, fertility levels do not tell the whole story. It is likely that even if two ethnic groups have similar fertility, the proximate determinants leading to that fertility differ. As different ethnic groups begin to limit fertility, it is expected that the reduction in fertility will also vary depending upon

the acceptance of various means of conscious fertility limitation, their accessibility and the impact of other social forces, for example the reduction in breastfeeding associated with urbanization, as will be discussed below.

One of the main questions is whether these ethnic differences exist even after controlling for socioeconomic characteristics. In other words, is there a residual ethnicity/cultural component that is not accounted for by different structural assimilation of ethnic groups? In Ghana, one study found that this was not the case; fertility differentials were mostly due to structural differences and the ethnic factor was found to be very weak (Addai & Trovoto, 1999). However, another study in Ghana found that the lineage systems and the ensuing conjugal relations, which differ between the North and South of Ghana, are important in influencing reproductive behavior (Aongo et al, 1997). Furthermore, traditional behaviors may be eroded with socioeconomic development. For example, among the Yoruba in Nigeria, there is a clear reduction in the period of postpartum abstinence with socioeconomic development, as the traditional extended family relationship changes to a more nucleated conjugal one (Caldwell and Caldwell, 1977). Furthermore, there are groups among whom terminal abstinence of grandmothers is strictly enforced; among the Yoruba it is common but sexual activity of grandmothers is not taboo. Among those groups reducing the periods of abstinence, there is an increase in contraceptive use, but this does not completely compensate for the reduction in abstinence (Caldwell and Caldwell, 1977). It is likely, therefore, that socioeconomic development will affect the fertility of each ethnic group somewhat differently and it is not at all clear that in the first stages of modernization that fertility will decrease or that

there will be a convergence towards replacement level fertility. Brunette (1996) studied ethnic differences in Nigeria and found that differences in levels of sterility and postpartum abstinence remained after controlling for socioeconomic variables. Only with sexual inexperience and contraceptive use did the differentials disappear. Agadjanian (2001) found an ethnic effect remained in Mozambique, even after controlling for socioeconomic characteristics, including religion. This effect differed between urban and rural regions.

Minority group status and fertility

A potentially confounding factor could be minority group status which may be important in determining fertility behavior, as proposed by Goldscheider & Uhlenberg (1966). The minority group often seeks to improve their security, social mobility, or both through their fertility behavior (Agadjanian, 2001). As Knodel et al. (1999) propose, a minority group that faces overwhelming discrimination, and for whom acculturation is not of great importance, use high fertility as a strategy to improve their situation to ensure group preservation and strength in numbers, with the importance of taking structural characteristics into account emphasized by Sly (1970). Further, in emerging democracies, such as Nigeria and Ghana, where ethnicity is still crucially important and coupled with rampant cronyism and nepotism, a minority group may seek to gain more electoral power through increasing its fertility. It is generally the case that minority groups have elevated fertility when compared with the same ethnic group in a majority position. (Knodel, et al 1999; Attane & Courbage, 2000; Basu, 1997; Courbage, 1992). In other words, the Malinke in Mali, where they represent about half of the population, are likely to have

lower fertility vis-à-vis other ethnic groups than the Malinke in Guinea, a relatively much smaller group. The literature studying minority group effects were formulated, for the most part, in the United States. While some researchers have tried to apply this hypothesis to other countries, little work has been done on Africa. The exception is Kollehlon (1989) in her work in Liberia; she did not find evidence for the minority group hypothesis, with structural factors accounting for ethnic differences in fertility. It is possible that the conceptualization of the minority group hypothesis, given its emphasis on psychosocial factors, needs to be modified for the African context. This paper intends to explore the issue further.

The fertility transition in West Africa

Fertility in West Africa has traditionally been high, even compared with the high rates prevalent throughout sub-Saharan Africa, with the social structure of West Africa presenting, in its strongest form, sub-Saharan African resistance to fertility limitation (Caldwell et al, 1992; Kirk and Pillet, 1998). Furthermore, ethnic competition and conflict occur frequently in the region. Examples from West Africa cited by Weinreb (2001) include the secession of the Igbo from Nigeria in Biafra; massacres of Gio and Mano by Krahn militia and subsequent revenge attacks on the Krahn; rebellions of the Tuareg in Mali and Niger; coups against ethnic oligarchies in Cameroon; conflict between northerners and southerners in Chad; and the civil war in Sierra Leone.

There is considerable heterogeneity in fertility behavior within the region with total fertility rates, as shown in Figure 2, varying from a low of 4.3 in Gabon (2000) to a high

of 7.5 in Niger (1998). There are a number of countries where the fertility transition has begun, including Benin, Ghana, Senegal and Togo. Early signs of a fertility decline exist in Burkina Faso, Cameroon, Cote d'Ivoire, Guinea, Gabon and Nigeria but the fall has not been sharp enough or prolonged enough to state unequivocally that the fertility transition has commenced. Mali and Niger show no signs of any decline in fertility. It should be noted that some countries may have lower fertility than desired due to the effect of pathological sterility (Kirk and Pillet, 1998; Larsen, 1994). Thus actual fertility rates may remain stable, masking a possible fall in desired fertility. Increasing access to antibiotics may cause a rise in achieved fertility if demand remains constant (Kokole, 1994).

Kirk and Pillet (1998) conducted a broad study of the fertility transition in sub-Saharan Africa. Overall, the African fertility decline can be broadly linked to socioeconomic development. However, fertility decline has been greatest in countries with strong family planning programs such as Kenya. Fertility limitation is usually initiated in urban areas (with the differential remaining even after controlling for socioeconomic variables). It spreads throughout the country through diffusion and increasing rates of urbanization.

Within countries, there are also differentials in fertility rates. Fertility varies between urban and rural localities, with education, geographical region and religion. At a first glance, fertility also appears to vary with ethnicity. A study in Nigeria by Isiugo-Abanihe (1994) showed that the Yoruba and the Igbo had the lowest fertility, as well as the lowest desired fertility and the lowest ideal family size. The Hausa/Fulani had higher fertility

and the Ishan ethnic group had the highest fertility. However, the ideal family size of the Hausa/Fulani was higher than any other group, indicating a latent unmet demand for children, probably due to pathological sterility.

Hypotheses

From the literature presented, it can be seen that there are three main explanations that can account for any effect that ethnicity may have on fertility and fertility related behavior, and these lead to my three hypotheses.

1. The socioeconomic hypothesis

The theory behind this hypothesis states that ethnic differences are due to socioeconomic differences. Therefore, ethnicity is associated with socioeconomic status, and once socioeconomic status is controlled, there is no association between ethnicity and fertility.

2. The minority group status hypothesis

For this hypothesis, where an ethnic group is a minority, its behavior will be different from the majority. If the ethnic group is marginalized and has little chance of social mobility then fertility will be higher than the dominant group. If the ethnic group has opportunities for social mobility but faces discrimination, then the fertility will be lower than the dominant group. To simplify the initial analysis, I hypothesize that the proportion of an ethnic group in a population will be associated with fertility, although the direction of the relationship will depend of the specific conditions of an ethnic group in a particular country

3. The cultural hypothesis

This is the hardest to nail down. It is in effect saying that there are cultural differences between ethnic groups that account for the differences in fertility. My third hypothesis is, that there is an association between fertility and ethnic group, and this relationship will traverse national borders. Further, there will be greater homogeneity in fertility within cross-national ethnic groups than within nations. I also expect that in states with weaker state structures and national identity, the ethnic effect on fertility and the proximate determinants will be stronger.

Data

The analysis is based on Demographic and Health Surveys (DHS) conducted over a six year period between 1999 and 2003 in six West African countries, where data on ethnicity are available. This time period was chosen in order to include as many countries as possible but to keep the analysis focused on approximately the same time.

The following surveys, shown in Table 1, meet the criteria:

Table 1: Countries and Survey Years

Country	Survey years
Benin	2001
Burkina Faso	2003
Ghana	2003
Guinea	1999
Mali	2001
Nigeria	2003

The following major ethnic groups, displayed in Table 2, traverse national boundaries and appear in DHS data[2]:

[2] Information on the names of the various ethnic groups was taken from Olson (1996), Middleton and Rassam (1995) and Gonen (1993)

Table 2: Ethnic groups by country

Ethnic group	Countries
Peulh/Fulfude/Fulani/Poular	Benin, Cameroon, Guinea, Mali, Burkina Faso, Nigeria, Senegal
Yoruba	Benin, Nigeria
Bobo	Burkina Faso, Mali,
Senoufo/Minianka	Burkina Faso, Mali
Touareg/bella/Tamachek	Burkina Faso, Mali
Haoussa / Hausa	Ghana, Nigeria
Malink / Malinke / Mandinka	Mali, Guinea,
Ewe / Adja	Ghana, Benin
Sarakole/Soninke/Marka	Mali Burkina Faso
Sonrai / Songhai/ Songhay	Mali, Benin

While one of the advantages of my proposed study is the inclusion of different countries it raises a serious challenge in the interpretation of the question and events. As Meekers (1992) points out, marriage in Africa is often a process rather than a single event, which will vary from culture to culture. So, trying to measure a proximate determinant such as age at first marriage may be difficult. It is often impossible for the questionnaires to be exactly the same; it may be the case that equivalent terminologies for some of the concepts are simply unavailable in all of the languages used (Awusabo-Asare, 1988). For example, in Yoruba, there is no one word that corresponds exactly to the English word 'fertility' (Renne, 2002).

Methods

Variables

The dependent variable in this analysis is current fertility, measured by births in the past year. I chose current fertility since I felt that it would both capture the current effect of ethnicity on fertility rather than children ever born, which is also influenced by events throughout the childbearing history of a woman. Further, in less developed countries with

high infant mortality rates, children ever born may not be accurate since children who died at young ages, especially long ago, may be forgotten. Originally, current fertility was operationalized as the number of births in the past five years. Using births in the past five years would allow more variation than births in the past year since more women intending to continue to a further birth are included, as well as avoiding fluctuations due to transitory social and economic phenomena. However, it was difficult to fit an appropriate model using either births in the past five years or births in the past three years. Rather than complicate the models, I decided instead to use a binary variable – whether there has been a birth in the past year. Admittedly, this variable is more sensitive to error variance, but the parametric form of this measure makes fitting a model much simpler and allows a more intuitive interpretation. Although this measure is far from perfect, it should still reflect the level of current fertility.

The explanatory variables are shown in Table 3.

Table 3: Variables used in the analysis

Control variables (depending on model): • Age and quadratic of age • Marital status (currently married, formerly married, never married) • Place of residence (urban/rural) • Number of child deaths
Socioeconomic status • Education (measured by the highest education level divided into no education, primary and secondary or more) • Wealth (composite indicator measure made up of 7 binary variables asking if a certain item was owned by or in the household. These are: Electricity, radio, TV, refrigerator, motorcycle/scooter, car/truck, telephone.). For all country, the alpha was above 0.7, indicating a good correlation between the individual measures contributing to the scale.
Culture • Networks (3 variables on the frequency of reading newspapers, watching TV and listening to the radio. These variables were included as binary dummy variables – whether the respondent uses the form of media or not.) Not asked in Burkina Faso. • Female autonomy (2 composite indicators. The first scale is a sum of the number of times a respondent answered yes to a questions asking if a husband is justified for beating his wife. The second is the number of times a respondent answered no to questions asking if a wife can refuse sexual relations with her husband. See appendix for Crohnbach's alpha). Not asked in Burkina Faso and Guinea. • Religion (Christian/Muslim/other).
Ethnicity • Self reported ethnic status as reported by the DHS. It should be noted that this is a predetermined set of ethnic categories that does not allow for mixed ethnicities. Someone who identifies with more than one ethnic group will either have to decide on the stronger group or assign herself to the 'other' category

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Table A1 shows Crohnbach's alpha for the scales constructed from different variables. Wealth includes seven dummy variables as to whether or not a certain good is present in the household. Beating and no sex are composed of the number of positive answers to either justified reasons for beating a wife and justified reasons for a wife refusing sex with her husband. These questions were not asked in Burkina Faso or Guinea. In most countries the indices are successfully capturing the same concept, with a high correlation

between them. The ‘no sex’ index in Mali is 0.62, which means that the results for this variable need to be interpreted with some caution; given the high levels in the other countries it is still an appropriate index to include.

Due to the problems of obtaining data on ethnic groups in Africa, my measurement of the percentage of each ethnic group was based on aggregations of individual level data from the survey data. This study is conducted using cross-sectional survey data taken at different points in time. There is always the problem of unobserved heterogeneity affecting the observed relationship between fertility and ethnicity. Since the study spans the years 1999-2003, this could be particularly problematic if the relationship of this unobserved factor and the variables under study changed significantly over time. For example, it is possible that the nation-state in Africa has strengthened over time with national identity becoming stronger and ethnic identity becoming weaker. Although this is possible, such dramatic changes are unlikely in the time period considered.

Along similar lines, it is possible that respondents who chose not to assign themselves an ethnicity are different from those who did. These people may be of mixed ethnicity or they may identify themselves according to nationality as their primary identity. However, I think that ethnic identity has not weakened in West Africa, and few people will not identify themselves according to ethnicity, even if they do hold nationalist views. Unfortunately, the DHS does not allow for mixed ethnicity in its coding system, so people are assigned to either a specific ethnicity or their ethnicity is unknown.

Data quality

Can these results be generalized to the whole population? The DHS is intended to be nationally representative. However, it is possible that many of the smaller ethnic groups are not sufficiently represented. Since the aim of this study is to identify cross-national trends, this may be problematic as an ethnic group that is a majority in one country may only be a small minority in another, and may therefore not be included in the survey. It may be necessary to restrict the generalization of the study to large cross-national ethnic groups such as the Fulani, Hausa, Yoruba and Ewe-Adja.

Further, this study is restricted to women only. Thus it is not possible to generalize to male fertility. Although male fertility is often affected by the same factors, it is not possible to assume that this is the case. In addition, it is not possible to generalize outside the West Africa region. The concept of ethnicity tends to differ from region to region and, although the findings of this study may suggest future directions for further research, it is not possible to generalize regarding the effect of ethnicity on fertility in other regions, even within Africa.

Differential maternal mortality may lead to selection bias. Women who have higher fertility are more exposed to the risk of maternal mortality. Further, it is reasonable that there will be differences in maternal mortality rates by ethnicity, due to different cultural practices regarding female access to healthcare and appropriate behavior during childbirth. In the countries being studied, maternal mortality can only be approximated from the direct sisterhood method based on DHS data or model based method because

vital registration is so poor. Table A2 in the appendix reports the maternal mortality ratios for each country studied. Since the maximum maternal mortality ratio is about 1,200 per 100,000 births in Mali and the maximum number of children born in the previous year is two in the highest fertility age groups, this is unlikely to be a large effect – in the worst case, assuming an extremely high maternal mortality ratio of 2% and a current fertility of two, it is unlikely to skew the sample. Also, maternal mortality tends to be greater at the extremes of the maternal age distribution - the oldest and youngest mothers are more likely to die in childbirth. These are also the ages where fertility is lowest, reducing the selection effect on the data. On the whole, it does not seem to be a serious weakness of the study.

Analysis

My first analysis is at the country level. I fitted models for each country and each dependent variable separately, having 2 nested models for each country. The first model included all the usual demographic controls for fertility, such as age, number of child deaths and marital status as well as socioeconomic and cultural variables such as education, female autonomy, place of residence, religion, wealth, exposure to mass media and place of residence. Then I added ethnicity to the model to test the strength of the ethnic effect. Since not all countries had the whole range of variables, the models were not identical for each country. The analysis was conducted using multivariate logistic regression.

The next stage was to create a multicountry file, appending all the separate country datasets, in order to test the three main hypotheses. In each case, three models were estimated, with each model adding more variables. Since not all the countries included all the variables, the more inclusive models in terms of variables led to countries being dropped. Each of the three models was estimated twice, first for ethnicity on its own and then with all the other variables.

The analysis was then restricted to eight large trans-national ethnic groups. The full model was estimated for each of the ethnic groups, with only the countries in which the ethnic group is present included. In addition to the full model, interactions between the country and the ethnic group were included. The explanatory variables included in the full model depended on the countries used for each specific ethnic group.

The final analysis tested for the effect of minority group status. A model was estimated using the sociodemographic controls and percentage of population that the individual's ethnic group represents in her country. Interactions between the percentage population and each of the 8 large trans-national ethnic groups were also tested.

Results and discussion

Descriptive

Table 4 shows the means and variance of the dependent variable, current fertility (defined as births in past year) by country and ethnic group.

Table 4: Descriptive statistics of fertility behavior by country and ethnicity.

Country	Current fertility (CF)					
	Overall		Ethnic group with highest CF		Ethnic group with lowest CF	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Benin	0.19	0.39	0.27	0.44	0.14	0.35
Burkina Faso	0.21	0.40	0.28	0.45	0.19	0.39
Ghana	0.15	0.36	0.31	0.46	0.08	0.27
Guinea	0.19	0.39	0.22	0.42	0.12	0.32
Mali	0.24	0.43	0.25	0.43	0.20	0.40
Nigeria	0.19	0.39	0.24	0.43	0.15	0.36

It is clear that there is a large degree of variance both between and within countries. Ghana has the lowest fertility, with a CF of 0.15 and Mali the highest with 0.24. However, even with the two most extreme countries, there is overlap with the ethnic groups, with the highest fertility ethnic group in Ghana having a mean of 0.31 and the lowest fertility ethnic group in Mali having a mean of 0.20.

The Fulani ethnic group is particularly interesting in this study because it is a large group spanning many countries. Although there are many subgroups, there is still a strong Fulani ethnic identity, and high fertility is traditionally particularly prized among the Fulani. It can be seen in Figure 3 that the variation in Fulani fertility is not as great as the variation in fertility between countries, although the Fulani in Guinea clearly have much lower fertility than the Fulani in Nigeria. This would appear, at a first glance, to be in accordance with my hypothesis that while ethnicity is a more important predictor of fertility than national affiliation, the nation still has an influence on fertility. I would also venture that a large, geographically dispersed, ethnic group that is divided into subgroups will display less homogeneity in their fertility behavior than small and more cohesive ethnic groups.

Analysis of variance

Despite these wide differences in fertility between ethnic groups, the majority of variation lies within them, as expected (see Figure 4). However, there are still significant amounts of variation that lie between groups, and it is this variation that I seek to explore and explain in this paper. Burkina Faso, Guinea and Mali all have relatively low levels of variance between groups (the CF variance between groups for Burkina Faso is not significant at $p< 0.05$). While the amount of variance between groups for CF is low, this amount varies between countries. The most variance in CF between groups is 1.8% in Ghana, and the lowest 0.13% in Burkina Faso. Although these percentages are fairly low, they are significant in all countries apart from Burkina Faso.

Multivariate analysis

Table 5 shows the result of the logistic regressions for individual countries in terms of the -2 log likelihoods of models without ethnicity included and with ethnicity included. Since not all variables are available for each country, there are three different types of models for model 1. Both Burkina Faso and Guinea had a more parsimonious model fitted, with all the variables available for the remaining four countries. It can be seen that ethnicity is not a major predictor of fertility in most of the countries examined. However, it is highly significant in Nigeria after controlling for various other socio-cultural and demographic factors, and is marginally significant in Mali.

Table 5: Individual country analysis of current fertility by variables included (-2 log likelihood shown with degrees of freedom in parentheses)

	Model 1		Model 2			
	Socio-demographic only	Socio-demographic + networks	Socio-demographic + networks + female autonomy	Model 1 + ethnicity	p between model 1 and 2	N
Benin			4989.5 (17)	4979.4 (25)	0.25	5960
Burkina Faso	5695.0 (10)			5681.4 (23)	0.40	6445
Ghana			3920.5 (17)	3896.4 (25)	0.12	5584
Guinea		5737.5 (13)		5703.3 (19)	0.11	6609
Mali			12511.4 (15)	12477.8 (24)	0.07	12395
Nigeria			5793.9 (17)	5773.6 (24)	<0.01	6114

In Table 6, the results of the merged analysis are shown. In this analysis, dummies are used for individual countries (with Benin as the reference country) and all the large ethnic groups are included, with other being the reference category. The coefficients are displayed for all the variables apart from ethnicity for which the significance of all the ethnicity dummies as a group is displayed. In contrast to the individual country analysis, ethnicity is highly significant in all the models. For the most part, country is also significant. However, both Ghana and Burkina Faso are no longer significantly different from Benin once ethnicity is included, indicating that ethnicity is a more important predictor of fertility than country. For Nigeria, including ethnicity actually increased the size of the country coefficient. Therefore, ethnicity does not explain the country differential but is, if anything, masking it.

Table 6: Coefficients from analysis of current fertility by variables included in model.

	Model 1 – sociodemographic only		Model 2 + networks		Model 3 + female autonomy	
	Ethnicity	Full	Ethnicity	Full	Ethnicity	Full
Age		0.26***		0.27***		0.26***
Age squared		-0.01***		-0.01***		-0.01***
Marital status (ref: currently married)						
• Never married		-2.08***		-1.98***		-2.56***
• Formerly married		-0.91***		-0.90***		-1.09***
Place of residence (ref: rural)						
• Urban		-0.21***		-0.18***		-0.20***
Education (ref: no education)						
• Primary		NS		NS		NS
• Secondary plus		-0.23***		-0.14***		-0.10
Wealth		-0.05***		-0.03***		NS
TV				NS		NS
Radio				NS		NS
Newspaper				-0.19***		-0.16**
Reasons refusing sex						-0.02*
Reasons wife beating						NS
Religion (ref: Other)						
• Christian		-0.10**		-0.14***		-0.18***
• Muslim		NS		NS		NS
Country (ref: Benin)						
• Nigeria		0.24***		0.23***		0.12**
• Mali		0.12**		0.13**		0.06
• Guinea		-0.15**		-0.17**		
• Ghana		NS		NS		-0.11
• Burkina Faso		NS				
Ethnicity: Wald chi sqr (D of F)	559.3*** (47)	161.6 *** (47)	538.4*** (38)	151.1 *** (38)	538.4*** (27)	92.2 *** (27)
-2 log likelihood	50863.8	43581.5	44332.9	38045.7	32368.5	27378.7
N	49,818		43,619		31,284	

* p <0.1. ** p< 0.05, *** p< 0.01 NS = not significant

Table 7: Interactions between ethnicities and countries

	Adja-Ewe	Bella	Bobo	Senoufo	Fulani	Hausa	Malinke	Yoruba
Age	0.22***	0.26***	0.26***	0.26***	0.26***	0.27***	0.25***	0.28***
Age squared	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	-0.01**	-0.01***
Marital status (ref: currently married)								
• Never married	-3.06***	-2.22***	-2.23***	-2.23***	-2.58***	-2.96***	-2.01**	-3.06***
• Formerly married	-1.23***	-0.97***	-0.96***	-0.96***	-1.11***	-1.11***	-0.98**	-1.28***
Place of resident (ref: Rural)								
• Urban	-0.18***	-0.33***	-0.31***	-0.31***	-0.23***	-0.16***	-0.28**	-0.11*
Education (ref: no education)								
• Primary	NS	NS	NS	NS	NS	NS	NS	0.11*
• Secondary plus	NS	-0.29***	-0.29***	-0.29***	-0.14**	-0.15*	NS	NS
Wealth	-0.08***	NS	NS	NS	NS	NS	NS	NS
TV	-0.18**					NS	NS	-0.12*
Radio	NS					NS	NS	NS
Newspaper	NS					-0.10**	-0.27**	-0.15
No sex	NS					-0.01*		
Beating	NS					NS		
Religion (ref: other)								
• Christian	NS	NS	NS	NS	-0.09*	-0.18**	NS	-0.15*
• Muslim	NS	NS	NS	NS	NS	NS	NS	NS
Country								
• Nigeria					0.12**	0.23*		0.11**
• Mali		0.60**	0.11**	NS	0.08**		0.13***	
• Guinea					-0.19***		Ref	
• Ghana	NS					Ref		
• Burkina Faso		Ref	Ref	Ref	NS			
• Benin	Ref				Ref			Ref
Ethnicity (ref: other)	-0.05	-0.89*	-0.05	0.15	0.04	-0.21	0.15***	-0.08
Interactions								
Ghana*Adja-Ewe	NS							
Mali*Bella		1.02**						
Mali*Bobo			NS					
Mali*Senoufo				NS				
Burkina Faso*Fulani					NS			
Guinea*Fulani					-0.18**			
Mali*Fulani					NS			
Nigeria*Fulani					NS			
Nigeria*Hausa						NS		
Mali*Malinke							-0.14**	
Nigeria*Yoruba								NS
-2 log likelihood	8938.7	18058.9	18068.7	38045.7	34810.0	9880.4	18292.9	10953.6
N	11544	18619	18619	18619	38570	12929	19029	13342

* p <0.1. ** p< 0.05, *** p< 0.01 NS = not significant

Table 7 examines the interactions effects of ethnic groups that are trans-national. Each analysis is restricted to the countries in which those ethnic groups are present, and each ethnic group is compared to non-members of that group. As can be seen, there is no uniform effect across the trans-national groups. The only group that differs significantly from non-members is the Malinke in Mali and Guinea. The interaction effect between Mali and Malinke shows that the Malinke in Mali and Guinea have very similar fertility, despite Mali having higher fertility than Guinea overall. The Fulani in Guinea also have even lower fertility than the relatively low fertility already seen in Guinea. However, none of the Fulani groups in other countries have fertility that significantly differs from their compatriots, and country has a much stronger influence on their fertility. Finally, the Bella in Mali have much higher fertility than the Bella in Burkina Faso; Malians have higher fertility than Burkinabe, and being Bella and Malian further increases fertility.

Finally, I wanted to see if minority group status could influence the ethnic effect of fertility. Table 8 shows the percentage of the population (from female respondents in the DHS survey) of each trans-national ethnic group studied. While some ethnic groups are similar in the percentage population, others vary greatly, such as the Hausa who represent 27% of all Nigerian women but only about 1% of Ghanaian women.

Table 8 Percentage female population of ethnic group by country

	Fulani	Malinke	Bella	Adja-Ewe	Yourba	Bobo	Senoufo	Hausa	Other	Unknown
Ghana				13%				1%	80%	6%
Mali	17%	50%	10%			3%	9%		8%	3%
Burkina Faso	7%		1%			5%	1%		86%	<1%
Guinea	36%	28%							36%	<1%
Nigeria	6%				11%			27%	56%	<1%
Benin	6%			15%	12%				63%	4%

Table 9: Effect of percentage national ethnic group and interactions

	Model 1	Model 2
Age	0.25***	0.25***
Age squared	-0.01***	-0.01***
Marital status (ref: currently married)		
• Never married	-2.62***	-2.62***
• Formerly married	-1.09***	-1.08***
Place of residence (ref: rural)		
• Urban	-0.23***	-0.23***
Education (ref: no education)		
• Primary	NS	NS
• Secondary plus	-0.21***	-0.21***
Wealth	-0.03***	-0.03***
Religion (ref: other)		
• Christian	-0.11**	-0.11**
• Muslim	NS	NS
Country (ref: Benin)		
• Nigeria	0.23***	0.21***
• Mali	0.07*	NS
• Guinea	-0.19***	-0.20***
• Ghana	-0.09*	NS
• Burkina Faso	NS	NS
Ethnicity (ref: other):		
• Fulani	-0.19***	NS
• Malinke	0.13**	NS
• Bella	NS	-2.13*
• Bobo	NS	NS
• Senoufo	0.21***	NS
• Yoruba	NS	NS
• Hausa	-0.19**	NS
• Adja-Ewe	-0.18*	NS
Percentage national ethnic group	NS	NS
Interaction: Percentage national ethnic group with -		
• Fulani		-0.19***
• Malinke		-0.54***
• Bella		NS
• Bobo		NS
• Senoufo		NS
• Yoruba		NS
• Hausa		NS
• Adja-Ewe		NS
-2 log likelihood	38765.936	43581.5
N		44,158

* p <0.1. ** p< 0.05, *** p< 0.01 NS = not significant

As can be seen in Table 9, for the most part, the relative size of the ethnic group is not having a significant effect on the fertility of ethnic groups, no matter which country they are in. The two exceptions are the Fulani and the Malinke. Therefore, I decided to examine the predicted probabilities of current fertility of members of these ethnic groups, compared with non members in different countries. The results are shown in Figures 5 and 6. The Fulani present a complex story. However, there does seem to be some evidence for the minority group status hypothesis. In Nigeria and Benin, the Fulani are a small minority and their fertility is higher than that of the non-Fulani However, in Guinea and Mali where the Fulani represent a greater proportion of the population, the fertility of the non-Fulani is higher. For the Malinke, those in Guinea where they are a minority have much higher fertility vis-à-vis the non-Malinke than in Mali. Despite these patterns, it is still not possible to characterize either Fulani or Malinke fertility cross nationally, and it would still appear that the majority of the variation is between countries rather than between ethnic groups.

Discussion

Ethnicity is not as important a predictor of current fertility as I initially thought. Fertility is clearly influenced both by the socioeconomic factors attributed to the individual and country level factors. The individual country analysis showed that ethnicity was only having a significant net effect on fertility in Nigeria. Obviously, in studies of this nature, unobserved heterogeneity is always a serious issue and could potentially account for the remaining differences in Nigeria. Thus, evidence is stronger for the structural hypothesis.

However, in the joint analysis, ethnicity remains a strong predictor, even after controlling for other explanatory variables, including country. Once the countries were included as dummy variables and the power was increased, it could be seen that, in fact, ethnicity remained significant whilst the country dummies became insignificant. Once again, Nigeria was an outlier in that including ethnicity actually increased the country differential. Nigeria may be unique since it is such a large and ethnically diverse country and suffers from more ethnic tension and violence than the other countries in the study.

Strengthening the structural argument, it would appear that despite strong ethnic affiliations in West Africa, a person's nationality has a stronger predictive value than ethnicity in determining fertility, at least in recent years. While in ethnically homogeneous countries this could be indicative of ideational factors as well, West African countries are linguistically and ethnically diverse. Therefore, if ideational theory were the dominant explanation for fertility behavior, the Yoruba of Benin and the Yoruba of Nigeria, for example, would be expected to behave more similarly than their non-Yoruba compatriots, which is not so for the majority of ethnic groups. However, there are some examples where ethnicity did prove to be important and traversed national boundaries. The interactions presented in Table 7 show that the manifestations of certain ethnicities in certain countries are significantly different. This is seen with the Bella and Malinke in Mali, and the Fulani in Guinea. Given that the Fulani are a widespread group, spanning many countries, it is not surprising that Fulani identity will take on a different form in countries as socially and geographically diverse as Benin and Mali. For further work, it would be useful to devise a measure of social cohesion of ethnic groups in order

to determine how cohesiveness, particularly across national borders, can influence demographic behavior. Unfortunately, this is beyond the scope of this paper and is a challenging analysis to perform due to the poor quality and availability of African data.

Looking at the other explanatory variables, fertility does seem to be affected more by the traditional socioeconomic determinants such as education, although an effect was only witnessed for post-primary education. It is known that only a few years of education has little effect on fertility in high fertility settings since it often encourages the adoption of certain Western behaviors such as reducing the length of post-partum abstinence, but has not yet sufficiently reduced demand for children to lead to a compensatory effect in contraceptive use. Indeed, women with some education may even have higher fertility than those with no education. In some cases where newspaper reading is included, education becomes non-significant. However, newspaper reading is capturing more of the literacy effect, rather than simply reflecting exposure to more diverse networks. The indicators of female autonomy included in some of the surveys were not significant in any of the models, although in some cases the number of reasons a woman could refuse sex was associated with decreased fertility at the 10% significance level. Interestingly, Christians had significantly lower fertility than those not adhering to Islam or Christianity, whereas Muslim women did not differ significantly. I would have expected Islam to have a greater effect, given its association with pronatalism. Clearly, in West Africa, Christianity is associated with the adoption of more Western norms of family size. Although speculative, this is suggestive of an ideational effect. More work is required looking at ethnic groups such as the Yoruba who are both Christian and Muslim.

Further, more country specific information is required on the manifestation of Christianity in each country. In order to facilitate the cross-national study, I created a large aggregate group of Christians that included Protestants, Catholics and other Christians. There are likely to be differences between those groups that should be explored more using more fine-grained distinctions.

The results did point somewhat to a minority group status effect. However, this evidence is far from conclusive, and the effect is indicated only for some of the trans-national ethnic groups. The data suggest that where a group is in a minority nationally, then their fertility will be elevated compared with non members of that group. Considering how the distribution of resources, including access to extremely important sources of social mobility such as government jobs, is ethnically influenced in many West African countries, it is feasible that a certain minority group will have many routes of social mobility closed off to them. They are likely to receive less infrastructure investment, less investment in education and less government aid. In this event, a family's survival strategy may involve maximizing the number of children that they have rather than increasing investment in fewer children since they know that their children are unlikely to receive a lucrative government job, which are saved for those of the dominant ethnic group. Given the high unemployment rate of educated West Africans, this is not an unlikely scenario and makes the returns to investment even lower and even more risky. This hypothesis is speculative, only alluded to by the results in my study, and is an interesting avenue for further study. Another shortcoming was my reliance on national aggregations for determining minority group status. The problems in using large regional

areas were pointed out by Roberts and Lee (1974) in their criticism of both Goldscheider and Uhlenberg (1969) and Sly (1970). They posit that minority group status effect operates at a much more local level, within communities. Such a study is beyond the remit of my paper, but given the fragmented and isolated nature of the countries examined, certainly is worthy of further research.

Conclusion

This paper looked at how ethnicity can affect fertility in an ethnically diverse region such as West Africa. The results show that the state is not as weak as initially thought in influencing fertility, even after controlling for socioeconomic factors. West African states seem to be better at integrating their citizens into a more comparable value system vis-à-vis fertility control and behavior than do ethnic groups. Clearly, a person's social and communicative networks are influenced more by nationality than by ethnicity. The spread of education based on a national curriculum, and state-based television, newspaper and radio networks may have facilitated the spread of national values within the national boundaries. In this case, my findings do not negate ideational theory but simply point to its changing nature. More work is needed to tease out the specific country level socioeconomic and ideational factors. Qualitative work could be particularly useful in understanding national and ethnic identities, and how this may impact demographic behavior. This paper highlights the danger in equating ethnicity with culture, particularly in regions which are undergoing major social changes. It is clear that ethnicity is taking a backseat when compared to nationality in determining fertility, but it is not clear how much of this is due to structural differences or to changing social networks.

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Appendix

Table A1: Crohnbach's alpha by country and index.

Country	Index		
	Wealth	Beating	No sex
Benin	0.78	0.83	0.70
Burkina Faso	0.83	n/a	n/a
Ghana	0.73	0.84	0.79
Guinea	0.75	n/a	n/a
Mali	0.79	0.76	0.62
Nigeria	0.73	0.8	0.89

Table A2: Estimates of number of maternal deaths, lifetime risk, maternal mortality ratio, and range of uncertainty (2000)

Country	Source of estimate	Lifetime risk of maternal death: 1 in:	Maternal Mortality Ration (maternal deaths per 100,000 live births)	Lower estimate	Upper estimate
Benin	Direct sisterhood method	17	850	490	1,200
Burkina Faso	Direct sisterhood method	12	1,000	630	1,500
Ghana	No direct data – estimate modeled	35	540	140	1,000
Guinea	Direct sisterhood method	18	740	420	1,100
Mali	Direct sisterhood method	10	1,200	680	1,700
Nigeria	No direct data – estimate modeled	18	800	210	1,500

Figure 1: Conceptual framework

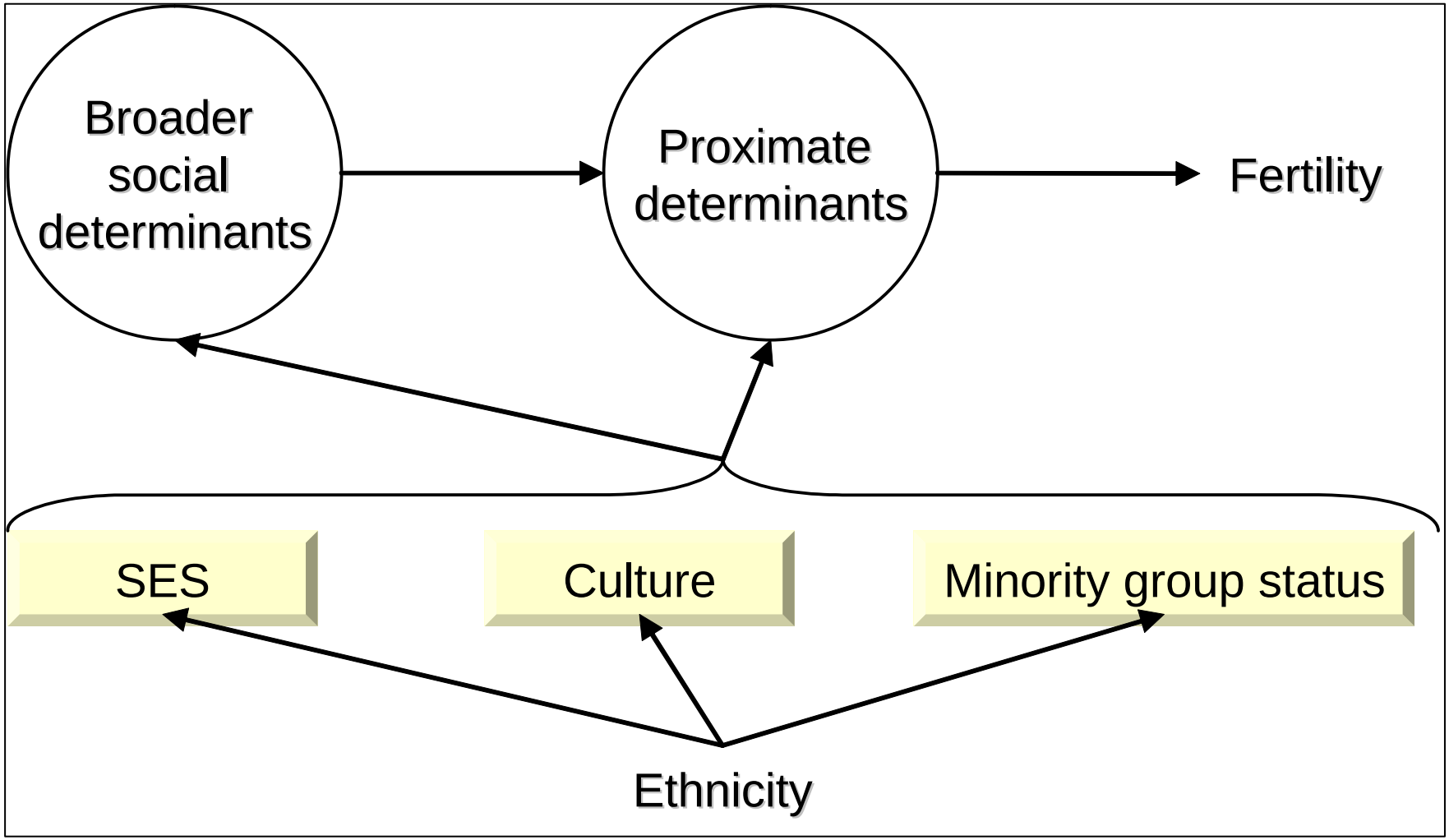

Figure 2: Total Fertility Rates in West and Central Africa

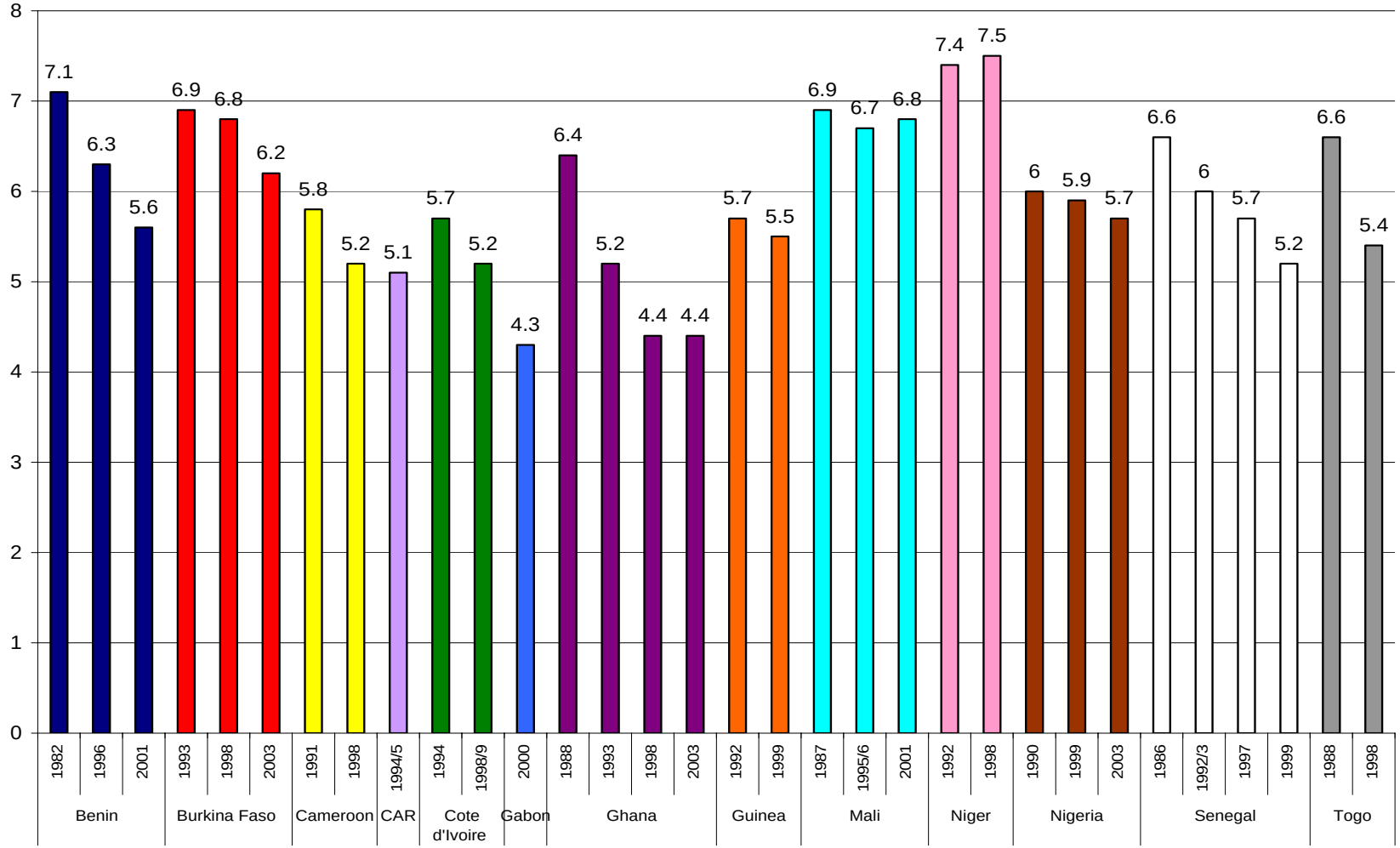

Figure 3: Current fertility by age of woman, country and ethnicity (Fulani and non-Fulani)

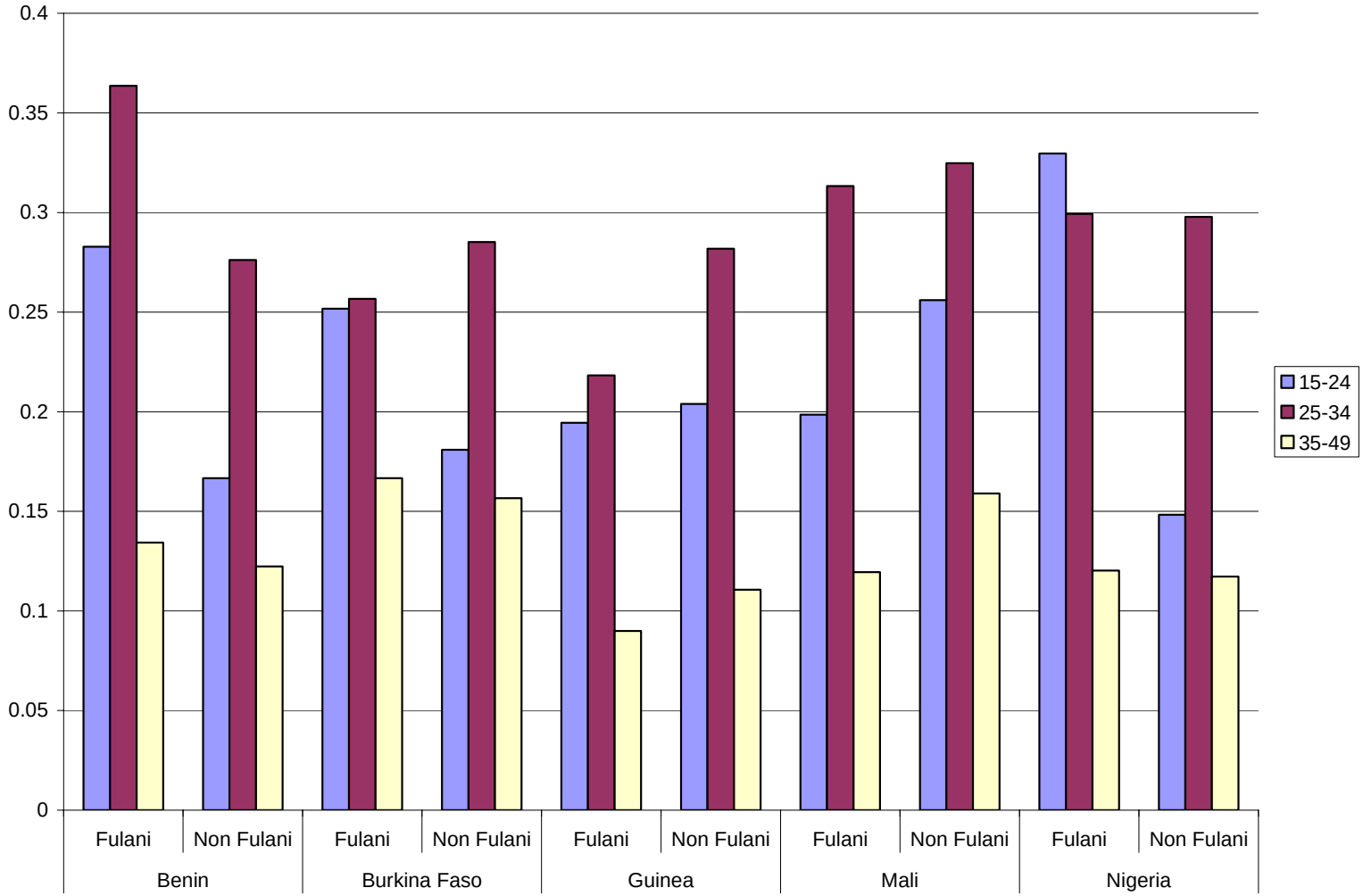

Figure 4

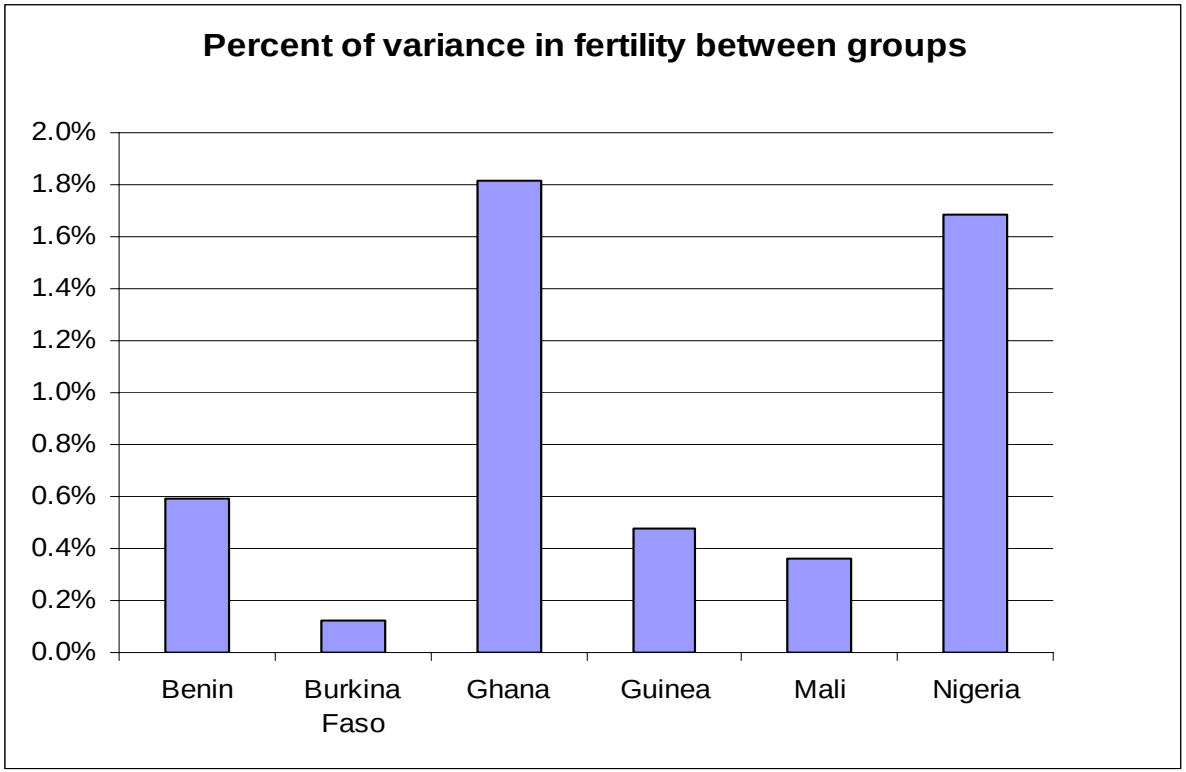
Percent of variance in fertility between groups
2.0%
1.8%
1.6%
1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%
Benin
Burkina Faso
Ghana
Guinea
Mali
Nigeria

Figure 5: Predicted probability of birth in past year, Fulani compared with non –Fulani

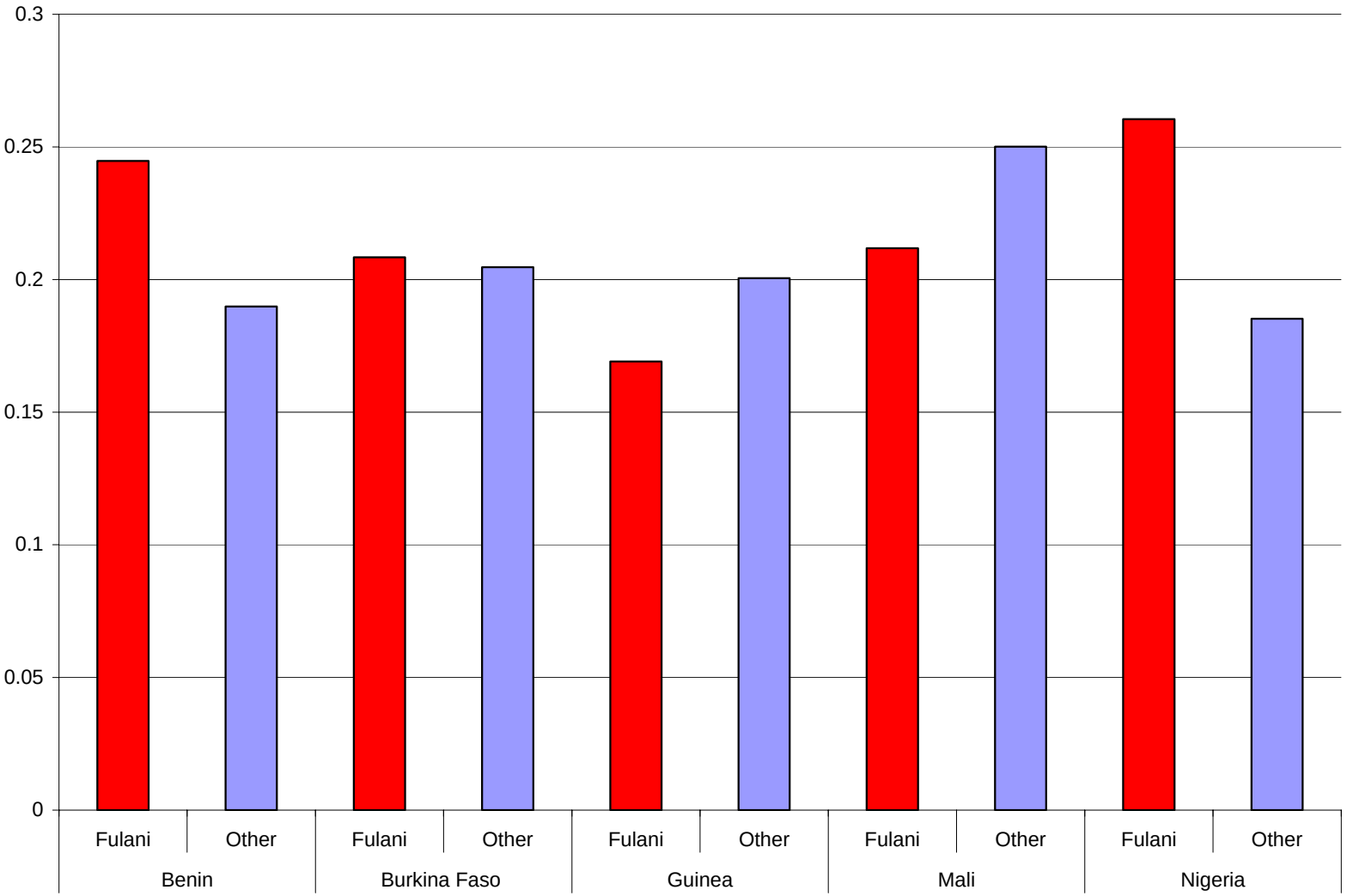

Figure 6: Predicted probability of birth in past year, Malinke compared with non –Malinke