URBANIZATION AND THE FERTILITY TRANSITION IN GHANA

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Abstract

This paper examines the way in which migration and urban residence operate to alter fertility outcomes within and across generations in Kumasi, Ghana. While urban-rural fertility differentials have long been established for most developing societies, the causes and exact nature of these differences among the migrants and between migrants and those of succeeding generations is not well understood. Rapid urbanization in sub-Saharan Africa is often portrayed as a demographic problem with deleterious social consequences. However, the evidence presented here suggests that rural-urban migration and urbanization may contribute positively to processes of fertility transition. Using data from the Kumasi Peri-Urban Survey, which was conducted May-July 1998, this paper suggests that migrants adapt quickly to Kumasi's urban environment, and that the mechanisms which lead to fertility reductions over urban migrants' lifetimes are solidified by the second generation. The survey collected information from households and individuals in two migrant settlement zones in Kumasi. The protocol identified first generation migrants, second generation residents with at least one parent who was a migrant, and urban natives of three or more generations. We collected monthly detail regarding the timing of residence changes and childbearing for the five years prior to the survey. Our data also include information about completed and recent childbearing and socioeconomic characteristics of individuals and households. Our results reveal generational differences in recent and cumulative fertility. While migrants exhibit higher cumulative fertility than second generation residents and Kumasi natives, their fertility is significantly lower than rural averages in Ghana. Children of migrants exhibit childbearing patterns quite similar to urban natives. Most noteworthy is the nature of the disparities in childbearing patterns between migrants and the succeeding generations. Migrant women have higher lifetime fertility than urban natives. Migrant women also exhibit higher fertility over the last 5 years than second generation or high-order urban natives. But these first generation women exhibit *lower* fertility (vs. urban natives) for the year immediately prior to the survey. These patterns lend support to an interpretation that combines rather than opposes theories of selectivity, disruption, adaptation and socialization. We conclude by discussing mechanisms that might explain these interrelated processes of fertility adjustment and suggest that policies discouraging rural-urban migration need to be revisited.

The Urbanization of Africa

A few countries in Africa have begun to exhibit signs of significant fertility decline, but overall, sub-Saharan Africa is notable for its continued high fertility (Cohen 1993). The persistence of high fertility in Africa features prominently in debates about whether fertility transitions in different regional and cultural contexts can be explained based on the same theoretical mechanisms (Casterline 1999; Mason 1997). While some theorists emphasize the fundamental commonalities that link all fertility transitions (Casterline 1999), others argue that assuming all transitions have the same cause(s) constitutes a critical mistake (Greenhalgh 1990; Hirschman 1994; Mason 1997). Increasing attention to social and cultural context and emerging demographic patterns in Africa seem to have led some theorists, including Caldwell and his collaborators, away from a universal theory of fertility transition and toward more regionally specific explanations (Caldwell 1982; Caldwell and Caldwell 1987; Caldwell, Orubuloye and Caldwell 1992).

Urbanization was one of the social structural changes associated with fertility transition in classic demographic transition theory (Thompson 1930; Notestein 1953). But more recent theorizing about fertility transition has moved away from macro-sociological and structural explanations. Emphases in contemporary theories of fertility transition include: 1) the importance of mortality decline (Cleland 1995; Casterline 1999; Mason 1997); 2) the central role of changes in household economics (Becker 1960; Schultz 1973); 3) the costs of birth control (Easterlin 1975; Easterlin and Crimmins 1985); and 4) diffusion models that emphasize the spread of ideas (Cleland and Wilson 1987) and importance of social networks (Bongaarts and Watkins 1996). The role of urbanization in fertility transition has received little attention in recent restatements of transition theory (Casterline 1999) and its potential contribution to

Africa's fertility transition has been largely overshadowed by widely shared assumptions that rapid urban growth is a social problem that should be discouraged.

Demographic dynamics in sub-Saharan Africa are frequently portrayed as beset by a host of problems, unlikely to soon replicate the demographic transition of other world regions. Indeed, the general depiction of the sub-Saharan African case in the development literature is quite bleak, with lagging economic indicators and marginalization (Castells 1998), compounded by a legacy of colonial disruption and post-colonial economic inefficiencies (Bates 1981). Africa's population problems are seen as both a cause and a consequence of underdevelopment. Most often, analyses focus on the social and economic costs of continued high fertility. Increasingly, attention is turning to the distribution of people, and specifically to sub-Saharan Africa's high rates of urban growth (Oucho 1990; Oucho and Gould 1993). Massive migration to cities is associated with failed rural development, urban poverty, overburdened social services, environmental degradation, and political upheaval. In West Africa, too, a series of social ills have been linked to rapid urban growth and "overurbanization" (D.A. Smith 1996).

The United Nations and most African governments view the rapid pace of urban growth as a serious policy issue. In 1998, 63% of African governments considered their patterns of population distribution to be a major problem (United Nations 1999), with rural-urban migration and the consequent growth of cities being the main concern. Over the past few decades, African governments have instituted a number of policies designed to slow rural-urban migration. These measures have included efforts to improve rural services and infrastructure, in hopes of reducing the incentive to move away from rural areas. Governments have also tried to encourage the development of small and medium-sized towns to draw rural-urban migrants away from the largest cities that tend to attract a disproportionate share of migrants.

The growing concern over levels of urban growth is at least partly founded in demographic reality. Cities have a long history in sub-Saharan Africa, and rural to urban migration is by no means a new phenomenon (Curtin 1995; Gugler 1996). However, the rate of migration, the size of the cities that have resulted, and the consequent social and economic problems are unprecedented (Stren and White 1989). Since 1950, the number of urban agglomerations in sub-Saharan Africa with more than one million people has grown from one to more than twenty-five (Tarver 1994). The United Nations (1996) estimates that by 2015 more than half of Africa's population will reside in urban areas. In West Africa alone, more than 50 million people are expected to migrate to cities in the next ten years (World Bank 1999). While sub-Saharan Africa is still characterized by the lowest levels of urbanization (the proportion of the total population that lives in urban areas) in the world, it is also experiencing the world's highest rates of urban growth (the percentage increase in urban population per annum). Although Africa remains the only part of the world where *rural* populations are expected to continue to grow well into the 21st century, the pace of urban growth is such that Africa's population distribution will continue to become increasingly urbanized.

In the past, both scholars and policy-makers have attributed the bulk of urban growth to rural-urban migration (Caldwell 1969; Liebnow 1986). Though the data are not completely satisfactory, current evidence suggests that natural increase accounts for about half to two-thirds of urban growth in Africa (United Nations 1999; Chen, Valente, and Zlotnick 1998). In other words, it is childbearing among people resident in urban areas, rather than people moving into urban areas, that accounts for most urban growth. Nonetheless, because of the age structure of Africa's urban population, the majority of adults in many of Africa's cities are first generation migrants (Gugler 1996). Further, rural-urban migrants in sub-Saharan Africa are increasingly

likely to be female (Bilsborrow and Zlotnik 1992; Gugler and Ludwar-Ene 1995) and young (Makinwa-Adebusoye 1990; Oucho and Gould 1993). At least one third of women of reproductive age in major cities in Africa migrated to the city in only the past ten years (Brockerhoff 1995). As such, many migrants will experience the preponderance of their reproductive careers in the city. Measuring and explaining the fertility behavior of migrants is more essential than ever for predicting future demographic trends and developing adequate population and development policies.

Rural-Urban Migration and Fertility

Countless studies have focused independently on migration *or* fertility in sub-Saharan Africa. However, demographers have conducted relatively little research on the relationship *between* migration and fertility in Africa. In other parts of the developing world, connections between rural-urban migration and fertility have been more extensively studied (Goldstein, White and Goldstein 1997; Lee and Farber 1984). With some caveats, this research has found that rural-urban migration is generally associated with fertility decline. The few studies that have been conducted in Africa have produced contradictory evidence (Oucho and Gould 1993). Demographic and Health Survey (DHS) data from numerous African countries show lower fertility rates in urban settings than in rural areas, and analysis of these data suggests an association between rural-urban migration and fertility decline (Debpuur 1992; Brockerhoff and Yang 1994). But other studies suggest that rural-urban migration in sub-Saharan Africa does not always produce significant declines in fertility (Kollehlon 1986; Hollos and Larsen 1992; Lee 1992). Further, some scholars have argued that in certain cases fertility may actually increase with urban migration (Nag 1979; Diop 1985; Cleveland 1991). Whatever the merits of the

individual studies, they raise important theoretical issues about the relationship between migration and fertility.

Four theories about the interrelationship between rural-urban migration and fertility have emerged in the literature (Brockerhoff and Yang 1994). Conventionally, these theories are labeled: selectivity, disruption, adaptation, and socialization. The notion that differentials between migrant and non-migrant fertility are explained by selectivity hinges on data that suggests migrants are different from non-migrants prior to migration. That is, some of the same characteristics associated with the decision to migrate (e.g., level of education, socioeconomic status, aspirations for social mobility, etc.) also affect fertility directly or indirectly. Rather than fertility falling (or rising) because of the experience and exigencies of migration itself, or because of adjustments to or changes associated with urban living, unique patterns of fertility among migrants are attributed to a selection bias through which fertility and migration behavior are mutually linked.

The disruption theory argues that temporary changes associated with migration itself interfere with fertility in the period immediately preceding, during, and after migration (Brockerhoff and Yang 1994). Most accounts of disruption have focused on its fertility inhibiting effects, primarily by reducing the frequency of sexual intercourse through spousal separation or stress. However, some attention has also been paid to short-term, potentially fertility-enhancing effects of rural-urban migration (Bongaarts, Frank and Lesthaeghe 1984). By reducing the duration and frequency of breastfeeding (and hence shortening the length of post-partum amenorrhea), by weakening traditional cultural prescriptions for lengthy post-partum abstinence, and by reducing the incidence of pathological sterility, urban life can erode customary fertility-inhibiting behaviors.

It is a legitimate question whether this loosening of traditional constraints on fertility should be considered disruption or adaptation. Those who describe this phenomenon (Bongaarts, Frank and Lesthaeghe 1984) see it as a temporary shift in the proximate determinants of fertility that will give way to longer-term urban fertility reductions through adaptation – hence it might be appropriately termed disruption. Conversely, because changes in breastfeeding and practices of post-partum abstinence are an adjustment to urban life and culture, such changes could also legitimately be termed adaptation. After all, adaptation is conventionally described as the effects of destination on migrants' fertility (Goldstein and Goldstein 1983). In adaptation, migrants' fertility attitudes and behavior undergo changes after migration as migrants adapt to new economic, social, and cultural environments (Farber and Lee 1984).

The theory of adaptation raises, in some respects, as many questions as it answers. Processes of adaptation may work at different levels, may change over time, and may not be completely understandable without accounting for the cultural context at migrants' place of origin. In addition, urban areas are not necessarily alike in their urbanism (Kollehlon 1986). It may be a fallacy to assume that adaptation takes identical forms across urban settings. Most explanations of migrant fertility behavior also tend to separate individual-level variables, such as age, education, and occupation, from place-level variables such as opportunity structures, availability of family planning services, and collectively shared social norms. Though individual and place-level variables are clearly interrelated, most studies do not adequately theorize these links. Discussions of adaptation jump from proximate determinants to larger cultural context and back to individual aspirations, intentions and strategies (to the extent that these are addressed at all) without specifying how these levels are interrelated. In addition, because most data used to

analyze the relationship between migration and fertility is cross-sectional, relatively little work has been done to analyze the effect of duration of urban residence on migrants' fertility.

The socialization theory extends the notion of duration across generations, arguing that changes in migrants' fertility behavior are most likely to occur in second generation migrants -- among people who grew up and were socialized in urban settings. This perspective contends that second-generation migrants' fertility is much more likely to resemble non-migrant urban natives than first generation migrants' fertility. Perhaps most important in reconciling the four theories is recognizing that they are not mutually exclusive. Each may provide explanatory power without negating the other. More difficult is constructing explanations that account for the social determinants of the proximate determinants of fertility, in ways that acknowledge the structural and cultural constraints on fertility behavior *and* the intentional strategizing of human actors (Bledsoe et al. 1994; Carter 1995).

The Village in the City? Migrant Adaptation and Fertility Behavior

The question of how rural-urban migrants adapt to the city in sub-Saharan Africa has received considerable scholarly attention. Social scientists have noted the degree to which Africans in the city maintain personal, social, political and economic ties to their rural places of origin (Gugler and Flanagan 1978; Oucho 1990). Much of rural-urban migration in Africa is circular, as both long and short-term migrants move back and forth between the village and the city. As Josef Gugler points out: "Migration is not a solitary affair, even when individuals move alone…. Today, villages throughout Africa actively promote the outmigration of young adults…. The decision to migrate in turn is rarely an individual one, rather it is usually a family decision…. The kinship group acts as an agent of urbanization." (1996:228-288). When

Africans move from the village to the city they regularly rely upon their kin already in the city for assistance with housing, food, education and employment. In addition, many migrant groups live together in urban enclaves, and even when this is not possible they maintain close ties and reproduce many of the institutions of their rural communities in the city.

How one interprets these continuing ties to the village and to kinfolk in the city has important implications for understanding migrants' fertility behavior. On the one hand, some scholars have made distinctions between "committed migrants" and "situational migrants," arguing that a large proportion of urban migrants do not really adapt to urban life because they remain so closely tied to their rural communities and kinfolk (Twumasi-Ankrah 1995). Some explanations of the continued high fertility of rural-urban migrants depend on this notion that migrants have not become truly "modern" urbanites:

> These behavioral continuities are due to the fact that these townsmen retain their links with their rural home, continue to take the opinions of rural relatives and friends into consideration, hold on to their rural assets and intend to return to their traditional community to retire and die. Thus, the personal urbanization of most townsmen is far from complete (Hollos and Larsen 1992:1209)

The notion that African migrants' continuing identification with and ties to their rural communities of origin might create and sustain pressures for continued high fertility merits consideration, particularly if kinship ties remain important for access to modern opportunities and resources (D.J. Smith 1999). However, it is less plausible that the reliance on kinfolk for assimilation in the city constitutes a failure of adaptation. If Gugler is correct in asserting that kinship groups act as agents of urbanization, they might also facilitate changes in fertility behavior. Most demographers tend to dismiss as an artifact of “data problems” claims that rural-urban migrants' fertility in sub-Saharan Africa may not decline significantly over the long term. Other social scientists who argue that migrant fertility in Africa takes place in a unique

sociocultural context that promotes continued high fertility have relatively little good data to support the claim. The character of migrants' fertility behavior in Africa is ultimately a question that requires closer empirical scrutiny.

Rural-Urban Migration and Fertility in Ghana

Patterns of rural-urban migration in Ghana resemble more general trends in sub-Saharan Africa. The number of urban areas, the rate of urban growth, and the proportion of Ghanaians who live in the city have all increased dramatically since independence in 1957. The number of urban areas has increased from 98 in 1960 to more than 200 in 2000. Urban areas are defined in Ghana as settlements of greater than 5,000 people. Provisional 2000 census estimates place the population of metropolitan Accra at 1.66 million persons, with nearly 3 million people in the Greater Accra region (GSS, 2000). Census figures place metropolitan Kumasi, the second largest urban agglomeration at just over 1 million. Presently, more than one third of the country's population live in urban areas and the extent of urbanization continues to increase (United Nations, 1996). Like many African governments, the Government of Ghana views the dramatic growth of its cities with concern, and minimizing the rate of rural-urban migration, promoting family planning, and facilitating sustainable urban growth are major population policy priorities (Ghana, National Population Council 1994). The recent World Bank *Development Report* raises the specter of African urbanization without accompanying economic growth, further adding to the concern (World Bank, 2000)

DHS data from Ghana show that urban areas have significantly lower fertility rates than rural areas, and, overall, Ghana's fertility rate is declining [Ghana GSS 1999]. However, relatively little is known about the contribution of migrants to Ghana's fertility, or about the

processes that shape migrant fertility as these new urban residents assimilate to their urban environments after migration and across generations. This study examines the way in which migration and urban residence operate to alter fertility outcomes within and across generations in Kumasi.

The Study Area

Kumasi is the capital of the Ashanti Region and is strategically located in the central part of the country. Kumasi has long been regarded as the commercial capital of Ghana (Devas and Korboe 2000), due to its location and its well-established trading links within Ghana and in West Africa more generally. Such factors have made it very attractive to migrants of diverse origins. Several years of structural adjustment and market-oriented shifts in the economy have (apparently) fostered local economic growth and contributed to a rural-urban migratory flow, particularly from the northern regions of the country.

Our survey was conducted in two traditional migrant-receiving zones, Mossi-Zongo and Akrom, both located within the city of Kumasi. These are communities of many migrants, although the diversity of origins of these migrants is much broader than colloquial descriptions would lead one to believe (White et al., 1999). Our informal interviews with Kumasi public officials and local residents in and near the study site suggested that recent migrants were coming from northern regions. Even the name of one of the settlements, Mossi Zongo, implies foreigners (*zongo)* from the Mossi (a northern ethnic group with roots in Burkina Faso). The general perception is true up to a point. Our census of the two areas indicated that many migrants and second-generation residents do, indeed, trace their ancestry in a way consistent with popular impressions, but there are other groups represented in the study region as well.

According to our census, of those not born in Kumasi, about 30% are born elsewhere in the Ashanti region and 33% are born in the North (including northern regions outside Ghana). Particularly prominent places of origin are the Upper East and Upper West Regions, two areas in the northern tier of the Republic which border Burkina Faso (White, et al. 1999). Other migrants are from the Northern Region (another of the formally designated regions in the country), and a modest percentage of migrants are from Brong-hafo, also a region to the north.

Northerners have long been resident in Kumasi; indeed Muslims of northern origin served the regional government prior to British colonial rule and there was, according to ethnographic sources, intermarriage between northern Muslims and the Ashanti (Schildkrout 1978:68ff.). Schildkrout identifies two general types of northern settlers to Kumasi during the colonial period: soldiers recruited by the British and traders and laborers. Cattle and cotton flowed south through Kumasi while salt and kola nuts flowed north. After cocoa was introduced in the Kumasi District in 1907, northern laborers worked on cocoa farms and in the mines and public works.

Still other migrants originate from outside the country. Most of these are from Burkina Faso. Although classified as international migrants, these individuals originate from regions similar in culture, indigenous language, and ecology to Ghana's Upper East and Upper West regions. While English and French are the national languages of education in Ghana and Burkina Faso, respectively, Twi (Ashanti) and other indigenous African languages predominate for communication among migrants in Kumasi. Less consistent with stereotypical characterizations of the migrant zones, some migrants (and second generation residents) trace their origins to the Central Region (along the Ghana coast), to Accra (capital), or to Ivory Coast. Suffice to say that the migrant population's diversity of origins, from within the northern regions, from other

regions of Ghana, and from outside Ghana exceeded the expectation generated by our exploratory fieldwork and the characterizations received at that time.

Mossi Zongo and Akrom, until recently, occupied the periphery of urban settlement, but now urbanization has expanded settlement beyond these locales. The zones are lower in socioeconomic status than other sections of the city, and the two communities have only limited urban infrastructure. They are, however, integrated into the regional economy and accessible to many urban services.

While the Mossi-Zongo and Akrom areas contain lower-income populations, the literacy level among our study population is not, at 60%, significantly different from the national level, estimated at 64.5% (Ghana GSS 1994). Some simple indication of the substantial differences in the composition of the migrant population can be seen in further comparison of these literacy statistics. Among those born in the North and aged 15 years or more only 35 percent could read and write, while 73 percent of those born in the Ashanti region were literate.

Data and Methods

The data used for the analysis in this paper came from the Kumasi Peri-Urban Survey. This survey was a collaborative study conducted by the Population Studies and Training Center of Brown University and the Institute of Land Management and Development of the Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. The design incorporates two key elements: a retrospective calendar and compact, ecologically defined study communities.

A complete census in March 1998 was conducted to provide current information on all households and basic demographic data on household members in the two settlements selected for the study. Information collected included age, sex, place of birth, place of birth of parents,

ethnicity, level of education, and marital status. The question on place of birth of parents makes it possible to identify adult offspring of migrants who are no longer living with their parents.

A notable aspect of the design is that local ecology is controlled. We chose these two areas because of their ecological position within the city and because of their link to migratory behavior. We sampled from a migrant-receiving zone, rather than the entire urban population, for three reasons: (1) we could directly examine the accuracy of perceptions about the population structure of these migrant zones (origins, ethnicity, labor force activity, etc.); (2) we could develop sufficient sample sizes of migrants and second generation residents; and (3) we could hold constant local ecology. This last is very important. This approach allows us to measure within-zone demographic variation, and it makes it much less likely that comparisons across demographic groups, e.g., generations, are due to variation in geographic location. Stated another way, residents within these zones have the same *geographic* access to local public services (health clinics, public transportation, etc.) and urban infrastructure (roads, water supply, etc.).

The two surveyed settlements were closely bounded urban neighborhoods, at most only a few minutes' walk from one side to another. Thus, we can assume that women in the survey are exposed to similar "neighborhood conditions," although the women themselves may not be close associates. Since geography is fixed, variation in spatial access to services – local transportation, health care, and family planning services – is unlikely. Socioeconomic variation is unlikely, then, to be a proxy for differences in ecological position. Unlike in the DHS, geographical location is unlikely to be an important predictor of fertility outcomes, and the socioeconomic variation we do see is more likely to be genuine.

Ten percent of the households from each zone were randomly selected, with separate strata for single and multiple person households using the household census as the sampling frame. The household sample survey was conducted from May to July 1998, and it contained information on household composition and basic demographic characteristics, measures of livelihood, land tenure, and health indicators.[1] In addition, the research design made use of a five-year retrospective life history calendar. The calendar recorded residential, marital, fertility, and labor force histories. The use of such an instrument in a low-income urban setting is novel. While retrospective monthly calendars have been used before to collect data on residential mobility and fertility (White, Moreno, and Guo 1995), most applications have been limited to areas of higher income and contraceptive prevalence.[2] Use of a calendar is challenging in a context where a substantial proportion of the survey population is illiterate. Based on a household-based sub-sample, we obtained 724 calendars from women of childbearing age in the study area. Calendar information was then matched back to individual and household information from the conventional household survey, and this matching provides some of the covariates for our analysis.

Our main objective in this paper is to examine and explain fertility behavior within and across generations in order to understand better the contribution of rural-urban migration and urbanization to processes of fertility transition. To do so we conduct analyses using Ordinary Least Squares, Poisson, and logit models. First we analyze cumulative fertility (children ever born, CEB) at the time of the survey. In this analysis we determine the way in which CEB varies with individual and household traits by modeling CEB as a function of age, education, household

[1] In 1999 supplementary data were also collected on the fertility and reproductive attitudes and perceptions of young migrant women aged 15-29 in the two study areas.
[2] The current rounds of the DHS use the calendar for "high contraceptive prevalence" populations.

socioeconomic status, and generation. These basic covariates carry much of the predictive power. Education is measured as level of schooling – primary, secondary – versus a reference category of no schooling. Migrant status is indicated by dummy variables for the first and second generation with those Kumasi native in the third and higher-order generations serving as the reference category. We include a simple continuous indicator of household socioeconomic status, taken as a Likert index of a set of household possessions. More sophisticated indices are seen to correlate well with such a simple count. We omit marital status from the model because it is problematic. First, women in populations such as our conceive and bear children without establishing a formal union. Second the process of marriage itself is somewhat endogenous, i.e. women who intend on lower fertility paths may consequently delay marriage.

In our two subsequent models we exploit the temporal detail of the calendar to examine fertility in the last 12 months using a logit model, and five years before the survey, using a Poisson regression model. Covariates remain the same, but to capture the age profile of current childbearing we add a quadratic term in age. Results in all three models are reported with untransformed coefficients.

Descriptive Results

Migrants and urban residence

Table 1 presents basic descriptive statistics of the study population by generation. These figures are weighted (reflecting sampling stratification by household size). Of women in the childbearing ages, we find that migrants are slightly older (mean age = 30.3 years) than either the second generation (25.0 years) or the higher-order generations (27.4 years) of urban native women. The older ages of migrants would seem to run counter to the empirical generality of

migration being an activity of the young. This pattern is, however, a product of the age dynamics of the populations. Migrants arrive at young ages, but age throughout their time in residence. The second and subsequent generations are replenished by children who enter the reproductive years. Using our measure of household socioeconomic status based on an index of household possessions we find that migrant women live in more modest circumstances than urban natives.[3] In addition, migrants clearly had experienced the least education. Over two-thirds had no schooling, whereas about two thirds of urban native women had exposure to primary or secondary education.

Background analyses of our census data yield insights into the link between migration and economic assimilation. Migrant status is associated with low socioeconomic status as measured by the International Socioeconomic Index Scores created by Ganzeboom, De Graaf and Treiman (Ganzeboom et al. 1992). The first generation is of lower socioeconomic status than the third generation, controlling for age, sex, education, and marital status. Women also hold lower status jobs; however, there is no significant difference between the second generation and the third generation, which suggests rapid migrant adaptation.

Fertility behavior

Figures 1 and **2** present Age Specific Fertility Rates (ASFRs) for a five-year (July 1993-June 1998) and one-year (July 1997-June 1998) period, respectively. As depicted in Figure 1,

[3] Akin to Filmer and Pritchett's finding that a household asset index "is a good proxy for a household's wealth" (1999:88), we constructed our SES index by summing twelve household possessions: working radio/cassette recorder, working television, kerosene stove, electric stove, gas stove, bicycle, clock, motor bike, coal pot (for cooking), mattress/sleeping mat, aluminum/enamel bowl, fridge/freezer. Previous analysis revealed that this simple Likert asset index is highly correlated with an index constructed from factor analysis, so we opt for the Likert version. Other recent efforts have been undertaken to provide proxies for such traits (Montgomery, et al., 2000)

migrants (Gen1) exhibit higher age specific five-year fertility rates than both second generation residents– women with at least one migrant parent (Gen2) – and urban natives (Gen3+). The Total Fertility Rate (TFR) for the migrants is 3.74, over one child per woman higher than that of second generation residents, 2.68. TFR for the urban native women, at 2.56, is just slightly lower than that of the second generation.

Conversely, Figure 2 shows that migrants (Gen1) generally exhibit *lower* very recent (one-year) child-bearing than both second generation residents (Gen2) and urban natives (Gen3+). This pattern of higher five-year fertility rates and lower one-year fertility rates among the first generation migrants may suggest disruption; the migration process may impede very recent childbearing among the migrants. However these fertility rates do not, of course, control for other socio-demographic characteristics of the sample women, nor is the timing of migration included in this analysis.

Comparison of these findings from Kumasi with those from the recent Ghana 1998 DHS is of interest [Ghana GSS 1999]. Although our sample area -- peri-urban and of marginal socioeconomic status -- would not conventionally be seen as at the leading edge of fertility change, recent childbearing in Mossi-Zongo and Akrom is roughly comparable to that reported by the DHS for Greater Accra. The TFR for our sample is 3.06, whereas the DHS TFR for Greater Accra is 2.71. Both of these are on par with the national urban estimate of 3.00 and considerably lower than the total national TFR of 4.48. Moreover, a national TFR in the vicinity of 4.5 suggests a notable decline in childbearing over the last decade or so in Ghana. Our particular interest is in the potential role of urbanization and rural-urban migration in this decline.

Multivariate Results

Cumulative Fertility: Children Ever Born

Our regression results indicate that cumulative lifetime fertility declines with urban experience. Model I in **Table 2** presents OLS regression results predicting children ever born (CEB) from a simple set of covariates. In this regression, we take CEB to be a function of age, socioeconomic status (measured by a Likert index of household possessions), education, and generation.

As expected, our results suggest a positive relationship between age and cumulative fertility. Net of other effects, each ten-year increase in age is associated with an additional 1.5 children. Further, socioeconomic status, as measured by the index of household possessions, is associated with increased cumulative fertility, although this relationship is not significant.

Education is closely tied to fertility behavior, but it is also closely tied migration. As individuals relocate from rural to urban areas, they may achieve higher levels of education (if within the schooling ages) and their children are raised in social regimes which expose them to more schooling. This was seen in the descriptive statistics, in that about 30 percent of migrants had obtained some schooling, while about 45 percent of the first generation had schooling. We also find, consistent with much prior research, that higher levels of educational attainment are associated with decreased lifetime fertility. Women with primary education are predicted to have nearly one-half (0.44) a child less than those with no (or little) education, and this difference is statistically significant. Women with secondary schooling are expected to have 0.82 of a child less, on average, than those with no education, and this relationship is also statistically significant. Thus, urbanward migration may serve to lower fertility to the degree that it places women in circumstances where their educational attainment will increase.

The main issue of interest in this model (Model I in **Table 2**) is the effect of generational status on fertility. Controlling for other characteristics, first generation migrants have given birth to 0.41 more children than Kumasi natives (the reference category), and this differential is marginally significant. Second generation women (who have at least one migrant parent) are not significantly different from Kumasi natives.

Recent Fertility: Past 5 Years

Table 2 also depicts multivariate analyses of recent childbearing – both five years (Model II) and one year (Model III) prior to the survey. As before, we take recent fertility to be a function of age, education, socioeconomic status, and generation. (In Models II and III, we include a quadratic term for age to account for the hypothesized curvilinear – e.g., inverted U-shaped – relationship between age and recent fertility.) These recent fertility results, akin to our findings for cumulative fertility, indicate that urban experience negatively affects fertility.

Model II presents the results of our poisson regression analysis of five-year fertility. The poisson model is used to estimate the number of children born during the five-year period July 1993 through June 1998. As expected, our results point to a curvilinear relationship between age and fertility, suggesting increasing risk of birth through about age thirty and decreasing risk thereafter. Both age and age-squared are statistically significant predictors of the risk of having a birth in the last five years. Further, socioeconomic status, as measured by our Likert index of household possessions, is associated with a slight increased risk of giving birth in the five-year period; with each one-possession increase in SES, the risk of birth increases by 7.4 percent, and this is significant. The positive finding of SES is noteworthy, especially in light of the controls for education and the research design, which fixes ecological position. The scale of the

coefficients in Model II indicates that primary or secondary education would outweigh SES considerably in most circumstances. In other words, it would take an increase of two standard deviations in the SES index (about 4 points) to counterbalance the effect of having completed primary education. On the other hand, the result does still suggest that children are a positive good, even in a low-income urban setting.

Similar to our cumulative fertility results, we find that higher levels of educational attainment are associated with decreased recent fertility. Women with primary education are just three-fourths as likely (74.5 percent) to have had a birth in the five year period than those with no education, and this difference is statistically significant. Further, women with secondary education are only half as likely (51.1 percent) to have had a birth than those with no education, net of other effects. Again, this relationship is statistically significant.

The effect of generational status on five-year fertility also follows the cumulative fertility pattern. Controlling for other characteristics, migrant women have a 38.8 percent increased risk of birth in the five-year period than Kumasi natives, the reference group. However, second generation women (who have at least one migrant parent) are not significantly different from the Kumasi natives.

Recent Fertility: Past 1 Year

Another measure of recent fertility – births in the one-year period prior to the survey (July 1997 through June 1998) – was analyzed using the same covariates as with five-year fertility (age, age-squared, socioeconomic status, education and generation). Given the dichotomous nature of one-year fertility (i.e., 0 = no birth and 1 = birth), a logistic regression model of one-year fertility was conducted. The coefficients in this model show the change in the

log odds of having a birth in the period. Model III in **Table 2** presents the results of this analysis. Odds ratios, reported in the text below, illustrate the likelihood of having a birth given a particular predictive characteristic.

Again, our results indicate a curvilinear relationship between age and fertility, suggesting increasing log odds of having a birth to a certain age and subsequent decreasing log odds. This, of course, corresponds to the pattern of age specific fertility rates. Both age and age-squared are statistically significant predictors of the log odds having a birth in the one-year period prior to the survey. Socioeconomic status, as measured by our Likert index of household possessions, is associated with a slight increased likelihood of giving birth in the one-year period; with each one-possession increase in SES, the odds of having a birth increases by 9.4 percent, but this relationship is not significant.

We also find that higher levels of educational attainment are associated with decreased recent fertility, but these relationships are not significant at any conventional level. Women with primary education are 89.1 percent as likely to have had a birth in the one-year period than those with no education. Women with secondary education are 77.5 percent as likely to have had a birth than those with no education, net of other effects.

The effect of generational status on one-year fertility deviates from the cumulative and five-year fertility pattern. Both migrant women and second generation residents are *less* likely than other urban natives to have had a birth in the one-year period. However, controlling for other characteristics, generational status is not a significant predictor of the likelihood of having a birth in the one-year period. The direction of this effect in the most recent year is consistent with the disruption hypothesis, yet the statistical evidence is not strong enough for us to conclude that disruption is the underlying influence.

Discussion and Conclusion

What makes urbanization potentially so important in understanding Africa's fertility transition is that all of the models of fertility change outlined above might operate more powerfully and swiftly in urban areas. In other words, whether one privileges macro-sociological changes, mortality decline, household economics, the costs of birth control, or social networks and the diffusion of ideas, there is ample evidence to suggest that any and all of these mechanisms operate with increasing significance in urban environments. While we do not focus extensively on the mechanisms for fertility transition in urban areas, our data on migrants, second generation residents, and Kumasi natives suggests that adaptation to and socialization in an urban environment is significantly correlated with fertility decline. Further, because our findings are compatible with a number of different theories about the mechanism(s) for fertility decline, the implications of these findings for policy do not depend on the acceptance of a particular theoretical perspective.

Our research design gives us superior insight into the dynamics of population redistribution and childbearing behavior. In this research we describe how fertility behavior is altered within and across generations. The relative ecological homogeneity of these two low-income peri-urban communities enables us to better tease out the effects of personal traits and generation on childbearing. The retrospective demographic calendar and the associated conventional household survey allow us to investigate separately the effects of migration and settlement within and across generations on short-, medium-, and long-term fertility. In fact, we find that migration predicts different outcomes for each category.

This study of two communities within Kumasi offers several important insights into the interwoven processes of migration, economic growth, urbanization, and fertility adjustment. Migrant receiving zones, and the very processes bringing them about, generate a set of policy concerns, ranging from whether the migrants adapt successfully to the local environment, to whether their arrival creates a strain on urban economic and physical infrastructure. Our findings suggest that migrants in the study population adapt fairly rapidly to the new urban environment.

While urban areas are universally acknowledged to manifest lower current fertility rates than rural areas, a finding demonstrated widely in DHS tabulations, the relative importance of urban residence, the migratory process, and selection in explaining these differences is not well documented. What is more, the pace and character of fertility adjustment (if any) to urban conditions is relatively uncharted. Many policy initiatives focus on the delivery of family planning services or changing the demand for children through mass media campaigns. Other policy positions emphasize incentives broadly connected to improved standards of living. This, of course, is the old family planning versus development debate. Our research allows one to understand the role of urban residence in promoting fertility transition.

We observe that the mechanisms of disruption, adaptation and socialization are all evident in the study population. Our results offer three key findings. First, the migratory process seems to disrupt migrant fertility temporarily, such that recent migrants have lower fertility than second generation residents and Kumasi natives in the immediate preceding year. Second, adaptation within the first generation is quite rapid. Although five-year and lifetime fertility among migrants are still significantly higher than among second generation residents and Kumasi natives, migrant fertility is considerably lower than typical rural patterns in Ghana. We cannot easily separate the effects of selection and adaptation without more data about migrants'

place of origin, but our results suggest some effects of adaptation, as migrants' fertility begins to approach levels characteristic of the second generation. Third, by the second generation, among women who were born in Kumasi, but who had at least one parent who was a migrant, differences with Kumasi natives have almost disappeared -- strong evidence for the importance of socialization.

Analysis of children even born (CEB) is instructive. Migrant women have appreciably higher lifetime fertility than second generation women or Kumasi natives. For women who have completed their childbearing, this differential is in the vicinity of two children per women. Multivariate results show that some of this is clearly compositional. Migrant women have lower education, and this is linked to higher levels of childbearing. Still, even after the introduction of controls for education and household socioeconomic status, migrant women are predicted to have nearly one half child (ever born) more than otherwise equivalent urban natives. Women in the second generation are predicted to have slightly higher fertility than Kumasi natives have, but this difference is not statistically significant. One noteworthy subplot to this story is the observation that the youngest age groups of migrant women (15-19 and 20-24) exhibit lower levels of cumulative fertility compared to urban natives.

More definitive are our results for 5-year fertility, an interval in keeping with conventional demographic analysis. Women in the first generation exhibit uniformly higher age-specific fertility rates, compared to women who are Kumasi natives. This results in a TFR exceeding one additional child per women. This differential is almost entirely erased by the second generation. Controlling for personal traits (age, socioeconomic status, and education) confirms that these fertility differentials of the first generation are real. They are partly due to composition effects (younger age and lower education) promoting higher fertility, but are not

completely erased in a multivariate framework. By the second generation, these fertility differentials are gone. Again education works powerfully to deter childbearing. Net of educational attainment, higher levels of household socioeconomic status are associated with higher rates of childbearing over the last five years.

Finally, we see some evidence for the disruptive effects of migration in the *lower* very recent (1-year) fertility of the migrant women. Multivariate results confirm that, controlling for background traits, migrant women have *fewer* children in the most recent year than second or third generation women. There are two reasonable interpretations. One interpretation is that these are women who are both more recently relocated and whose sexual partners may be in the place of origin or undertaking circular migration, a common phenomenon between Kumasi and the North. Thus, they are less at risk of conception than other women. The other interpretation is that these women are consciously constraining their fertility by avoiding a childbearing union or practicing contraception in order to settle into the modern economic and social life of the city. In other work, we have found that many of these migrant women are economically active.

All told, what we see is a picture in which urbanization promotes fertility transition. This takes places in several ways, through several mechanisms. First, higher levels of education and other human capital opportunities associated with urban living are associated with lower fertility rates. Second, controls for education indicate that other features of urban living, particularly those associated with socialization among the second generation, serve to lower fertility independent of education. Because of our study design, we know that differences we observe (unlike those in some other studies) cannot be attributed to ecological variation, differential access to urban infrastructure, unequal geographic proximity to health services, and the like.

Women who move from the countryside to the city arrive with higher lifetime childbearing, and even over the remaining years of urban residence may have, on net, more births. But urban life provides powerful incentives or lifestyle constraints that can serve to change the fertility regime. We see this in the lower fertility rates of the most recent year. On net, the fertility adaptation is fairly rapid. Second generation have fertility rates that are nearly indistinguishable from those who are urban natives of the third or higher order generation.

Low-income urban residential neighborhoods or enclaves (favelas, shantytowns, zongos) populated by migrants are conventionally seen as deleterious or problematic by policy-makers, emblematic of uncontrolled urbanization and overly rapid population growth. Our results, however, call into question some of the concerns raised in the realm of population policy, both with respect to the fertility transition and with regard to urbanization itself. Our results from this well-defined ecological setting point to the rapidity of fertility change both within and across generations. We find that urban residents of rural origin have higher lifetime fertility but lower recent fertility. More important, we uncover quite substantial adjustments by the second generation. Urban residents in developing countries are participating in the fertility transition, most likely within their own reproductive careers and certainly through those of their children.

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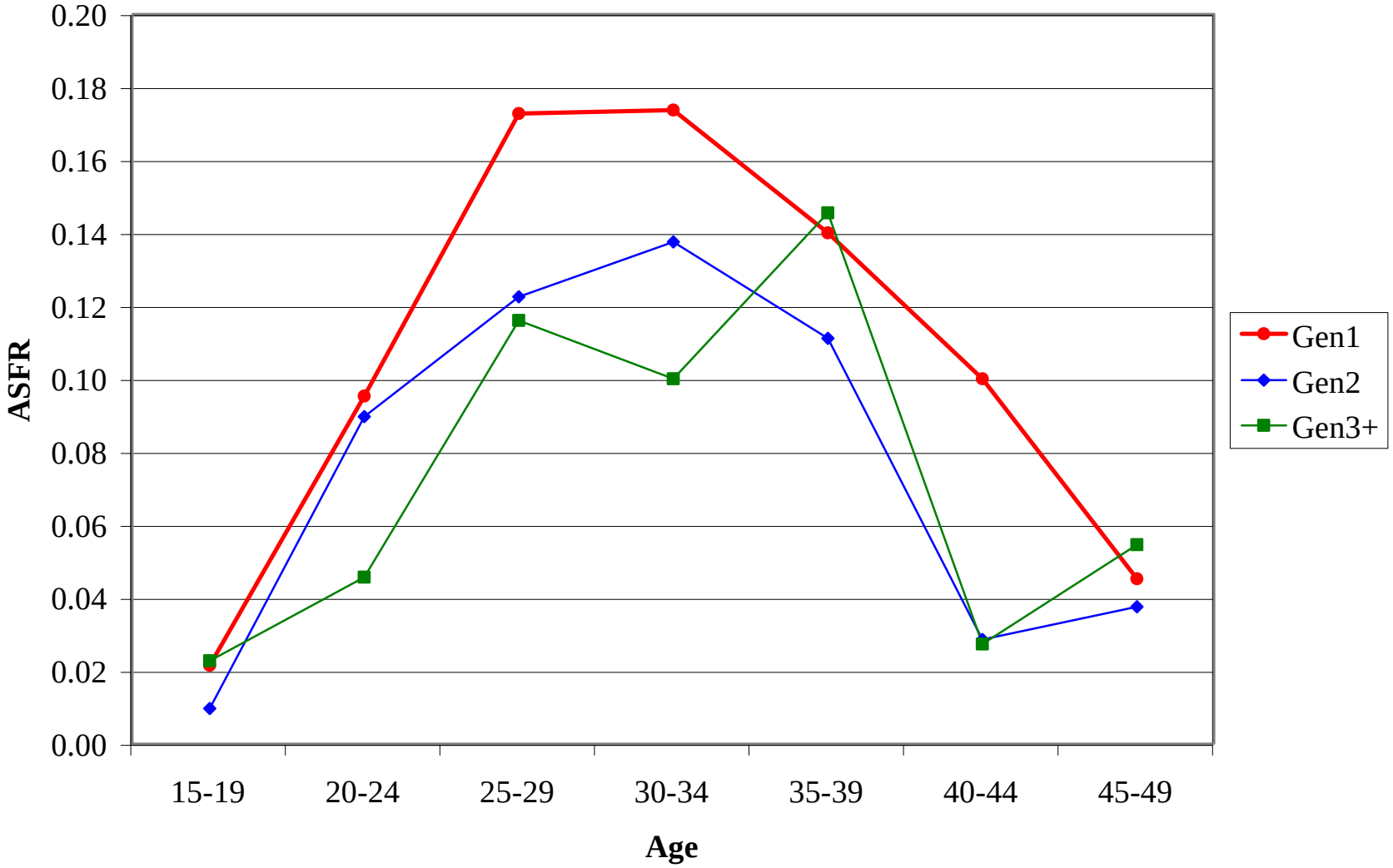
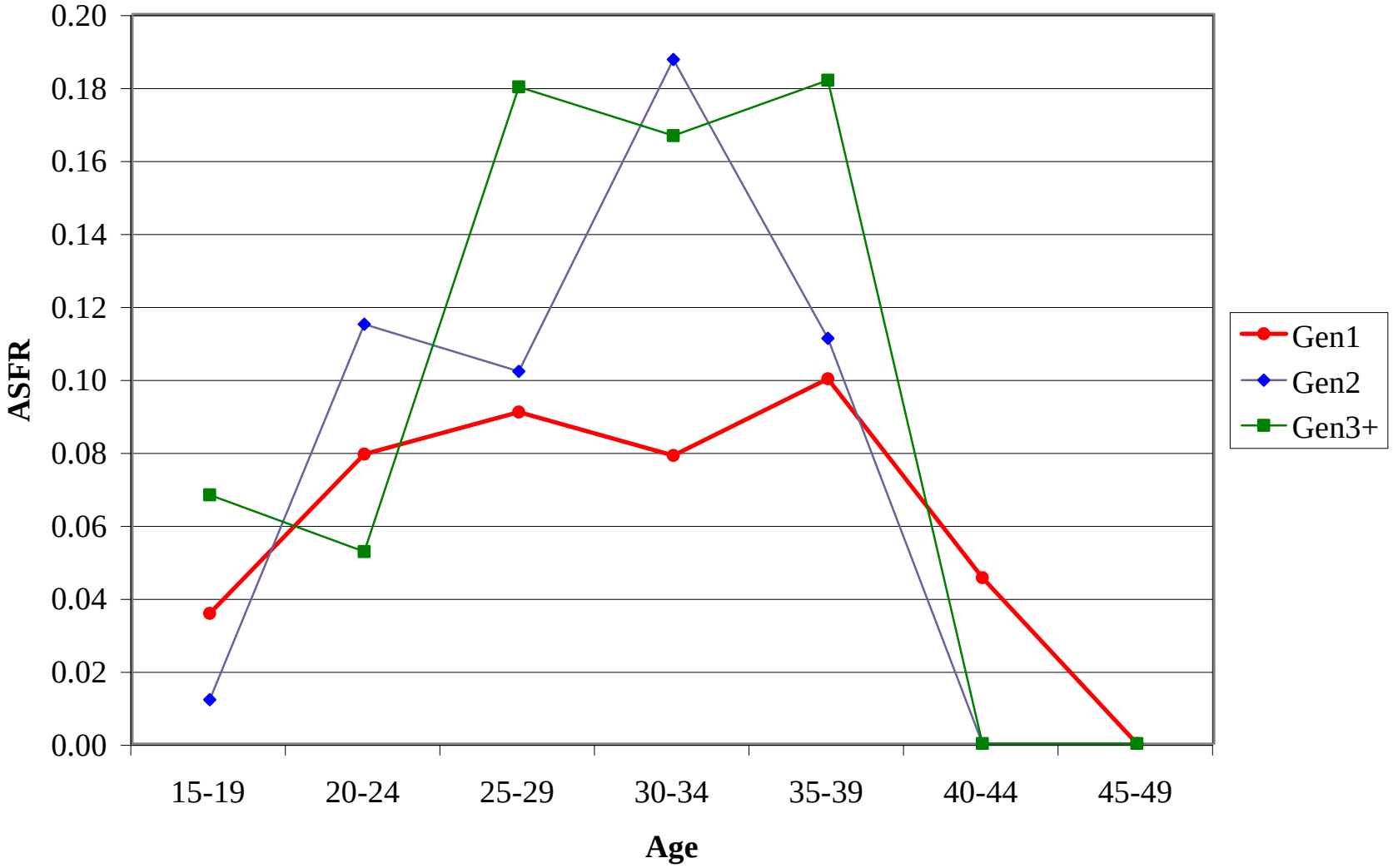
Figure 1. 5-Year (1993-98) Age Specific Fertility Rates



Results are weighted by household size.

Figure 2. 1-Year (1997-98) Age Specific Fertility Rates



Results are weighted by household size.

Table 1. Sociodemographic Characteristics of Sample Women for All and by Generation

(Weighted proportion, unless indicated)
Kumasi Peri-Urban Survey, 1998

Characteristic	N	All (Std. Dev.)	Gen1 (Std. Dev.)	Gen2 (Std. Dev.)	Gen3 (Std. Dev.)	Min	Max
Proportion	747	**1.000** (0.000)	**0.337** (0.473)	**0.374** (0.484)	**0.289** (0.454)	1	3
Age (mean)	747	**27.479** (8.965)	**30.308** (9.231)	**24.976** (8.214)	**27.420** (8.643)	15	49
SES Index (mean)*	747	**5.252** (1.830)	**4.798** (1.789)	**5.356** (1.750)	**5.646** (1.874)	0	10
Education							
None	747	**0.531** (0.499)	**0.692** (0.463)	**0.548** (0.499)	**0.323** (0.469)	0	1
Primary or Middle	747	**0.387** (0.487)	**0.243** (0.430)	**0.380** (0.486)	**0.562** (0.497)	0	1
Secondary or beyond	747	**0.082** (0.274)	**0.065** (0.246)	**0.072** (0.259)	**0.115** (0.320)	0	1
Literacy	747	**0.453** (0.498)	**0.278** (0.449)	**0.466** (0.500)	**0.642** (0.481)	0	1
Fertility							
CEB (mean)	743	**2.272** (2.715)	**2.901** (2.778)	**1.934** (2.709)	**1.969** (2.522)	0	13
5-year Fertility (mean)	747	**0.431** (0.658)	**0.563** (0.738)	**0.373** (0.627)	**0.354** (0.572)	0	3
1-Year Fertility	747	**0.082** (0.274)	**0.068** (0.253)	**0.082** (0.275)	**0.097** (0.297)	0	1

* Measured via an index of 12 household possessions.

Table 2. Effect of Migration on Fertility

Kumasi Peri-Urban Survey, 1998

	Model I OLS **Cumulative Fertility** N = 743		**Model II** Poisson **Five-Year Fertility** N = 747		**Model III** Logit **One-Year Fertility** N = 747	
Independent Variable	**Coef.** (Std. Err.)		**Coef.** (Std. Err.)		**Coef.** (Std. Err.)	
Intercept	**-2.350**	***	**-9.345**	***	**-13.547**	***
	(0.427)		(0.933)		(2.521)	
Age	**0.153**	***	**0.557**	***	**0.792**	***
	(0.010)		(0.061)		(0.174)	
Age^2	--	--	**-0.009**	***	**-0.013**	***
			(0.001)		(0.003)	
SES	**0.079**		**0.071**	**	**0.090**	
	(0.048)		(0.033)		(0.079)	
Education						
None (ref)	**0.000**	--	**0.000**	--	**0.000**	--
Primary	**-0.437**	**	**-0.294**	**	**-0.116**	
	(0.190)		(0.127)		(0.299)	
Secondary	**-0.818**	**	**-0.672**	**	**-0.255**	
	(0.323)		(0.264)		(0.522)	
Migrant Status						
Gen1	**0.406**	*	**0.328**	**	**-0.385**	
	(0.225)		(0.146)		(0.356)	
Gen2	**0.268**		**0.092**		**-0.140**	
	(0.213)		(0.152)		(0.330)	
Gen3+ (ref)	**0.000**	--	**0.000**	--	**0.000**	--
	F = 53.00		X^2 = 148.314		X^2 = 36.58	
	R^2 = 0.2960					

*** = p < 0.01; ** = p < 0.05; * = p < 0.10