The Start of the Sexual Transition in Mali: Risks and Opportunities

Claudine Sauvain-Dugerdil, Bassoutoura Gakou, Fatou Berthé, Abdoul Wahab Dieng, Gilbert Ritschard, and Mathias Lerch

Analysis of data from a questionnaire survey of 2,000 young Malians undertaken by the authors in 2002 demonstrates that, even in underprivileged urban and rural populations, changes in sexual behavior are emerging. Among women, first sex and motherhood are taking place slightly later, and a minority is now dissociating sexuality and procreation. Our data confirm the considerable impact of female education on this transition. Girls' sexual activity before procreation is also influenced by lower religiosity. Among men, in contrast, in a traditional context of late sexual debut and fatherhood, the trend is toward earlier sexual activity and procreation. Fatherhood is delayed, however, among better-educated, wealthier, and less religious urban men, who therefore experience a longer period of sexual activity before they begin to build their own families. The study concludes with an analysis of the possible association of the sexual transition with young people's increased vulnerability resulting from their adoption of risky sexual behaviors and from unfavorable conditions surrounding the arrival of their first child. (Studies in Family Planning 2008; 39[4]: 263–280)

The transition from adolescence to adulthood has become a new subject of scientific study over the past two decades. Youth is recognized as a separate stage of life (Amit-Talai and Wulff 1995), and, since the International Conference on Population and Development (ICPD) held in Cairo in 1994, it has emerged as a development concern (UN 1994; WHO et al. 1997). Research conducted on African populations, as on populations elsewhere, emphasizes the lengthening of adolescence. Findings often refer implicitly to explanatory models developed for Western young people, which consider five dimensions of the transition to adulthood: the postponement of various threshold events, the dissociation of these different entry points into adulthood, the reversibility of some of them, their fragmentation (becoming long processes rather than a clear threshold), and their changing meanings (for example, the alteration of marriage) (see such pioneering works as Gokalp 1981; Young 1987; Bumpass 1990; Galland 1991; Blossfeld 1995; Villeneuve-Gokalp 1996; and Charlot and Glasman 1998). Life-course studies, especially those concerning the transition to adulthood, have moved away from the notion of periods of life to that of transitions characterized by changes in status (Calvès et al. 2006). Amidst notions of complex life trajectories and fuzzy states (Antoine et al. 2006), meaningful threshold events are increasingly difficult to identify.

Yet, because of specific traditions and contexts, the transition situation in Africa is distinct from that found elsewhere (d'Almeida-Topor et al. 1992; Lauras-Locoh and Lopez-Escartin 1992; Bledsoe and Cohen 1993; LeGrand and Mbacké 1993; Ahlberg 1994; Delaunay 1994 and 1998; Westoff et al. 1994; CERPOD 1996; Hertrich 1996; Antoine et al. 1998; Bongaarts and Cohen 1998; Caldwell et al. 1998; Bozon and Hertrich 2001; Hertrich and Lesclingand 2001; Guillaume and Khlat 2002; Agwanda et al. 2004). Numerous studies of African societies have shown that entry into adulthood is a long process marked by a series of events that take place over a period of sev-

Claudine Sauvain-Dugerdil is Professeure Titulaire and Directrice, Abdoul Wahab Dieng is a doctoral student, Gilbert Ritschard is Professor of Social Statistics, and Mathias Lerch is a research assistant, University of Geneva Laboratoire de démographie et d'études familiales, Faculty of Social and Economic Sciences. Bassoutoura Gakou is a graduate student and Fatou Berthé, M.D., is Assistant, University of Mali, Faculté de Medicine, de Pharmacie et d'Odonto-stomatologie. Correspondence should be addressed to Professor Sauvain-Dugerdil, University of Geneva, Laboratoire de démographie et d'études familiales, Uni Mail-40 boulevard du Pont-d'Arve, CH-1211, Geneva 4, Switzerland. E-mail: claudine.sauvain@ses.unige.ch.

eral years. Economic autonomy, for example, often is realized only late in life (Gendreau 1998; Antoine et al. 2001; Agwanda et al. 2004). The establishment of a new family nucleus also may take many years. The sharing of a common residence may come about only after several births, and marriage may comprise a series of steps extending over a long period (Hertrich 2001; Mouvagha-Sow 2002).

Studies conducted in Africa also show that entry into adulthood is radically different for girls and for boys. Their trajectories range from a virtual absence of youth for girls (Kleiner-Bossaller 1992) to a long period of socially accepted freedom for boys (Spencer 2005). As Locoh (1995) explains, because of the long history of demographic fragility in Africa and concern about reproduction, women have been valued mainly for their fertility, and the social system has been built to maximize it, in particular by means of very early marriage, often occurring even before puberty, which deprives girls of their youth (Mensch et al. 1999). In some groups, however, youth is a recognized, although brief, phase. Among the Mandenka in Mali, the ages between childhood and marriage include a stage for nubile girls aged 13–15 (Marcoux 1994). In some ethnic groups, young women in this age group enjoy the freedom of youth until they move to their spouse's home. Among Dogon tribes, this period can last longer, until the birth of the second or even the third child (Rondeau 1992; Hertrich 2001).

Marriage in these settings is an institution tightly controlled by the family, in some cases even by the lineage, which engages in a long process to find a suitable wife or husband for the young. Men must wait to marry until they have achieved the social capacity to become husbands; therefore, they tend to marry late. Currently, in West Africa, the difference in age at marriage between spouses is roughly nine years (Bozon and Hertrich 2001; Hertrich 2001). During this waiting time, young men enjoy a long carefree period. Among the Mandenka, mentioned above, this period is the so-called single-farmer stage, occurring between the ages of 16 and 24. Cases of extreme freedom among young men, as can be observed in East Africa, have been interpreted as a strategy of the elders to deny young men decisionmaking power for as long as possible (Spencer 2006).

The postponement of young people's entry into family life and the dissociation between their sexuality and procreation is a global phenomenon, occurring at different paces in different settings. Demographic and Health Survey (DHS) data for African countries show the emergence of this "sexual transition." In varying degrees throughout the continent, Africa is experiencing the worldwide trend toward an increasingly gender-neutral youth culture, characterized by the convergence of female and male behavior (Preel and LeBras 1995). In earlier times, with the exception of some local traditions of sexual freedom and premarital fertility (considered as proof of fecundity), first intercourse for girls was linked with marriage. The dominant model was that of sexuality closely associated with procreation, experienced early among women, and less strictly and much later among men. New trends reflect postponement of first intercourse among females and earlier sexual activity among males. In some countries of Central and East Africa, males are becoming sexually active at an even earlier age than women (Bozon and Hertrich 2001; Mouvagha-Sow 2002). Moreover, marriage is being delayed and women are engaging increasingly in premarital intercourse, as men have done and continue to do. First sex is not occurring earlier on average, however, and adolescent pregnancies are not increasing, but the proportion of adolescent pregnancies occurring outside of marriage is increasing (Locoh 1995; Locoh and Mouvagha-Sow 2005; Mensch et al. 2006). Contraceptive prevalence remains low in most African countries, and access to reproductive health services remains difficult for unmarried young people. Therefore, the sexual transition in urban settings has been accompanied by a dramatic increase in induced abortions (Guillaume 2000; Rossier 2003).

These changes reflect complex social permutations associated with greater educational attainment, the influence of non-African values, and the weakening of family and social control in an atmosphere of growing economic, political, and social insecurity. Economic constraints, for example, are expressed in the persistence of large households. In many urban settings, the average size of households is increasing as a result of the inability of a growing number of young people and young families to make their own living (Locoh 1995; Locoh and Mouvagha-Sow 2005). In most African countries, girls' education has improved and is linked with a slow change in the status of women. This change is not a direct consequence of greater gender equity, however, but rather the result of women's increasing role as the last resort for family survival in situations of deep economic crisis. Also, in many cases, such as in Mali, improvement in girls' education is less than that of boys, and the gender gap is widening.[1] The interactions between greater duration of schooling, new values, and economic constraints influence trends in male age at marriage in a complex way. Although changing values tend to lower male age at marriage, economic constraints tend to cause young people to postpone marriage. In urban settings, the increase in female celibacy is also an index of women's growing economic insecurity (Antoine and Nanitelamio 1990; Aduayi-Diop 2003). After an initial decrease in young men's age at marriage,

which reflected the loosening of family control, men's age at marriage has increased in recent years (Hertrich 2001). In other words, just as "poverty Malthusianism" has been recognized as the dark side of the fertility transition (Cosio-Zavala 2001), the sexual transition should not be viewed only in terms of progress in quality of life. In many cases the freedoms of youth are replaced by early economic responsibilities and new uncertainties. As participants explained during the interviews conducted for our pilot study, the abdication of parental responsibility, especially by fathers, is a consequence of growing incapacity to fulfill the role of breadwinner (Sauvain-Dugerdil and Dieng 2002).

Debate is ongoing concerning the risks associated with the sexual transition. In some studies, premarital sex is considered to be associated with risky sexual behavior, which may result in increased prevalence of HIV infection (Bongaarts 2007). Other researchers suggest that young married women are more vulnerable than unmarried women because they are less able to refuse unprotected sex with their husbands than are unmarried women with their partners (Clark 2004).

In Mali, the sexual transition is in an early stage. The latest DHS data (2001) show that male age at first intercourse has fallen by two years (from 21 years to 19 years) between the generations born before 1950 and those born 20 years later. Among women, the median age has not changed, but the start of the transition is indicated by a one-year difference in age at first sex between residents of the capital city, Bamako, and those in rural settings (16.7 years and 15.8 years, respectively), as well as a growing gap between first intercourse and first child. Age at first childbirth has been postponed by 2.1 years between those aged 25–29 years and those aged 20–24 years in 2001, and this gap between residents of Bamako and those living in rural areas has increased from 1.5 years to 4.1 years between these two cohorts.[2]

The objective of this study is to analyze the sexual transition in a poor zone of Bamako, incorporating a few reference points from an isolated rural setting. Special attention is paid to gender issues: we consider whether the new behaviors concern girls and boys equally and whether they result in greater gender equity than existed prior to the transition. The first concern is to test whether the emerging behaviors reported nationally in the DHS data are also to be found in the survey areas, and to examine which young women and men report these pioneering behaviors. Therefore, we compare what can be considered the more progressive social strata with the less progressive (younger versus older birth cohorts, and urban versus rural residents). By analyzing the personal characteristics of these young "pioneers," we also seek to learn whether they belong to better-off groups. In other words, do these emerging behaviors reflect new opportunities that are open to the more privileged, or do they reflect the constraints of insecurity? Lastly, we test whether this sexual transition is associated with riskier behavior.

Data and Methods

The data used here are drawn from the main survey of the *Chantier Jeunes* project, which aims to study the factors of vulnerability associated with the transition to adulthood.[3] Vulnerability is considered from an internal and an external point of view. The project examines the personal characteristics that make young people more vulnerable. (A second component, still in progress, focuses on structural factors relating to vulnerability—that is, service provision and how local actors and institutions deal with young people's needs.) The project is conducted in two different settings: a large peripheral zone of the capital city, and a small, remote, rural community (Dogon villages around Boni, in the municipality of Haire, within the *cercle* [administrative unit] of Douentza).

The Bamako site was chosen as a place where a new culture of youth is expected to emerge under the double pressure of precariousness and contact with new values; the rural sample provides a point of reference. Until very recently, the rural population remained outside of the current social changes and development programs (Sauvain-Dugerdil 1980 and 2002; Sauvain-Dugerdil and Dougnon 2006). The two contexts are so dissimilar, in fact, that the survey methods used had to be adjusted to each setting.

The urban study is based mainly on a survey conducted in 2002.[4] It includes a biographical section with questions about activities, residence, family, and health events, and modules on the respondent's present situation and behavior with regard to occupation, reproductive health habits, social network, and time use. A total of 1,819 young people were surveyed, half in Sicoroni, a large peripheral area that provides unskilled labor to the city. Two smaller samples of 300 participants each were interviewed in Bandiagara Coura, a subsector of Sicoroni where Dogon immigrants settle, and in Niarela, the oldest section of town.[5] The three urban areas were chosen to represent central through peripheral settings, and none can be considered especially socioeconomically well off. Men and women are included equally in the sample's three age groups, which represent three stages of the transition to adulthood. The large differences in age at first childbirth between men and women led us to use gender-differentiated age limits: 12–15 years for girls and 15–19 years for boys as adolescence; 16–19 and

20–24 for youth; and 20–24 and 25–29 for young adulthood (the time of family formation). The same number of girls and boys from each of the three groups was interviewed at each site. Whenever possible, a boy and a girl were interviewed in the same household to diminish the bias that can be introduced in the gender comparison due to heterogeneity that was not taken into account by the variables measured in the survey.

For the rural population, an adapted version of the questionnaire survey was used in 2002 for interviewing 200 respondents. Yet, in this case, the questionnaire did not prove to be the best research tool. The size of the sample was limited because in some villages groups of young people declined to cooperate.[6] Moreover, a series of socioeconomic and cultural data such as were gathered from the Bamako sample proved to be useless for learning about the rural population, which is homogeneous in several particulars (they lack schooling, possess no conveniences or sanitation, and have little cultural heterogeneity). Therefore, we refer here only occasionally to the rural sample and cannot include it in the regression analysis.

We examine the sexual transition through the timing of sexual debut (age at first sex), age at first pregnancy,[7] and the dissociation between sex and procreation (the length of the interval between the two). The analysis consists of descriptive statistics, survival curves, and logistic regressions. Descriptive statistics are used mainly to recode the original answers given by respondents into variable categories in a way that satisfies both logical criteria (the meaning of the category) and statistical ones (the number of cases). We apply survival analyses to compare the timing of the transition in Bamako with that in the rural setting, and to test the pertinence of a series of independent variables. In this study, we reproduce only the curves derived from age at first intercourse in relationship to girls' and boys' settings and educational level. These show an impressive association between girls' schooling and the sexual transition. This first step led us to select the variables to be included in the multivariate analysis by omitting those showing no association with data for either sex—that is, for ethnicity, size and composition of household, and setting in Bamako.[8] Because of the strong gender divide with respect to the timing of the transition and the effects of the independent variables, all analyses are performed separately for women and men.

We apply a life-event analysis to age at first intercourse, age at first pregnancy, and the time elapsed between them. All individuals are included in the first two, except those who already had intercourse (and became pregnant) but for whom the date of the event is missing. The interval between first sex and first pregnancy is calculated according to the risk of first pregnancy since first sex. The calculation is made for all individuals who already had sex and whose age at first sex and, if relevant, age at first pregnancy are valid. The timing of events was recorded in years, because it is unrealistic to hope to obtain more precise information. Therefore, for accuracy we use discrete-time hazard regression models by applying logistic regressions to person-year data (that is, each case, or line of the file, corresponds not to an individual but to a year in the individual's life during the period studied).

The independent variables kept in the analysis (described in Table 1) allow us to examine the heterogeneity of behavior in terms of a complex combination of modernization and socioeconomic and cultural trends.

Table 1 Number of study participants in the urban sample, by selected characteristics, according to sex, Bamako, Mali, 2002

Characteristic	Women	Men	Total
Total	942	877	1,819
Birth cohort			
1987–90 W / 1983–87 M	308	303	611
1983–86 W / 1978–82 M	323	297	620
1978–82 W / 1973–77 M	311	277	588
Education			
None	378	204	582
Primary incomplete [a]	273	156	429
Lower secondary incomplete [b]	190	220	410
Upper secondary+ [c]	90	272	362
Standard of living			
Low (≤ 1.5 index items)	344	317	661
Medium (1.6–2 index items)	258	240	498
High (> 2 index items)	339	320	659
Religious practice			
None/irregular	328	337	665
Regular	548	487	1,035
Residence during childhood (< 11 years)			
Bamako	644	589	1,233
Mainly Bamako (> 5 years)	41	41	82
Always elsewhere in Mali	158	173	331
Mainly elsewhere in Mali (> 4 years)	53	32	85
Mainly outside of Mali (> 4 years)	42	42	84
Already had sex	424	528	952
Residence at time of first sex			
Bamako	268	366	634
Elsewhere in Mali	132	133	265
Outside of Mali	24	29	53
Already had a child [d]	337	134	471
Vulnerable to risky sex			
Reports no risky behavior	691	428	1,119
Reports at least one risky behavior	251	449	700
Vulnerable after first childbirth			
Reports no unfavorable conditions	804	788	1,592
Reports at least one unfavorable condition	138	89	227
Vulnerable to addiction			
Consumes no tobacco, alcohol, or other substance	937	716	1,653
Consumes tobacco, alcohol, and/or other substance	5	161	166

[a] Includes those without a CEP (certificat d'enseignement primaire). [b] Includes those with a CEP but no DEF (diplôme d'enseignement fondamentale). [c] Includes those with a DEF and higher. [d] Also includes those who are pregnant or whose partner is pregnant at the time of the survey.

The time trend, studied according to differences among birth cohorts, is used as a proxy for modernization. The birth cohorts are distributed in three groups of similar size reflecting the ages of the young people interviewed. The survey is designed to capture the specificity of lifestyles in a nonprivileged urban setting in the following way: we compare the timing of the sexual transition in the urban and rural settings, but also distinguish among urban dwellers with regard to their previous places of residence. The place of residence prior to the survey is used as a time-varying characteristic for each year of life. Thus, the hazard model tests for the risk of experiencing the event (first sex or first childbirth) for each year in reference to place of residence at that time—that is, whether the timing of the transition differs when it occurs before the respondent's arrival in Bamako. In the analysis of vulnerability, we consider the main place of residence during the first ten years of life. For both variables, the original statements were grouped under three headings: Bamako, elsewhere in Mali (mainly rural), and outside of Mali. In our sample, 72 percent report that they have lived either mainly or exclusively in Bamako, and 67 percent of those who report having had first sex report having done so while living in Bamako. Therefore, we examine whether the lifestyle of those not reared in Bamako differs from that of the city-dwellers. Most of the migrants come from rural Mali, which is known to be much more socially conservative than the capital city. We have no information, however, about the extent to which these migrants are representative of their place of origin.

Whether education has an effect on the sexual transition and whether it is an indicator of socioeconomic status are important questions to consider. In the analytical model, therefore, we first consider education and then control for standard of living. Another important distinction to make is that between the effect of schooling and length of time at school: Is simply being enrolled in school significant, or do a certain number of years of education cause sexual behavior to change? We distinguish, therefore, between those who have never been to school (40 percent of the girls and 24 percent of the boys) and those who have attended for a few years without completing primary school, those who have begun the secondary level, and those who have gone beyond the diploma that is received for the first level of secondary school, a level still rarely attained among girls (10 percent of those surveyed, compared with 32 percent of boys). The survival analysis shows that the second and third groups do not differ with regard to sexual behavior change; therefore, we consider them jointly in the regression analysis.

Standard of living is measured according to an index that includes four dimensions of living conditions in the household: conveniences (electricity, radio, television, and refrigerator), sanitation, means of transportation, and type of dwelling. The index is the average of the four variables, some of which are weighted (modern sanitation, ownership of a car, having a concrete floor, and having a roof each double the score). Only one-third of the households in the sample possess more than half the index items. The index is recoded into three categories of similar size: the lowest level refers to households with a score of 1.5 or less, the highest, more than 2.

Cultural characteristics are studied on the basis of ethnic origin and religious practice. The ethnic groups represented among the young people interviewed are aggregated into four categories on the basis of their size in the sample and broad cultural similarities (Bambara, the main group living in Bamako and surroundings; populations from northern Mali, subdivided by main occupation between herders and those working in agriculture or fishing; and others). Young people do not differ significantly with regard to ethnic origin, and this variable's inclusion in the regression analysis does not improve the model. Therefore, ethnicity has been dropped in the models presented here.

Religion is meaningless as a characteristic for analysis because the great majority of young people interviewed are Muslim (98 percent of girls and 95 percent of boys; 1 percent and 2 percent, respectively, are Christian; 0.1 percent and 0.5 percent are animists; and 0.4 percent and 3 percent declare no religion). They differ to an unexpected degree, however, by their declared frequency of religious practice (none, regular, and irregular). Nonpractice of religion is rare (5 percent of girls and 8 percent of boys). For the analysis, nonpractice is considered jointly with irregular practice. These less-religious young people account for 37 percent of girls and 41 percent of boys. Girls, therefore, appear to be only slightly less religious than boys, which confirms that the study design provides good comparability in terms of social context.

Level of schooling achieved, standard of living, and religiosity at the time of the survey are considered to be characteristics stable enough to function as proxies for these social, economic, and cultural traits and are included in the regression analysis as fixed variables. In addition to place of residence, another time-varying characteristic—advancement in age—is included in order to control for the strong effect of age on the probability of sexual debut and procreation.

In the last part of the analysis, we discuss the association between early sexual transition and behaviors related to some form of vulnerability. We employ a threefold index conceived by Fatou Berthé, third author of this study (Berthé 2005; Berthé et al. 2005). This index embraces the

notion of vulnerability as a consequence of risky behavior or exposure to unfavorable conditions. It is drawn from the survey data concerning sexuality, the context of first childbirth, and consumption of alcohol, tobacco, or other substances. Degrees of vulnerability are not distinguished in the analysis, but young people who present at least one condition of vulnerability are categorized as:

- vulnerable to risky sex—that is, they have had multiple partners, casual sex, and/or unprotected sex (59 percent and 85 percent of girls and boys in the sample who had already had sex at the time of the survey);
- vulnerable in reference to childbirth—that is, they were not married, they reported the pregnancy as unwanted, or they experienced negative life changes associated with entry into parenthood[9] (41 percent and 66 percent of young women and men in the sample who already had a child);
- vulnerable to addiction to tobacco, alcohol, and/or other substances self-declared as drugs (18 percent of boys, very rare among girls).

We analyze the probability of vulnerability at the time of the survey by using a logistic regression applied to individual data (each individual corresponds to a case). This analysis considers only those young people who had already had sex and, in the case of the second vulnerability variable, those who were already parents. Substance addiction is introduced as an extra independent variable in the male models. The time-varying characteristics employed in the first analyses (age group at time of survey and childhood residence) are transformed into fixed ones. In the analysis of vulnerability associated with parenthood, the limited number of respondents who were already parents led us to adjust some categories of the explicative variables. We keep only two age classes for women (<20 and 20+ years) and two for men (<25 and 25+ years); all of those who have attained more than a primary education are combined with the highest level of schooling; and those who have grown up in Bamako are compared with all newcomers to the city.

Results

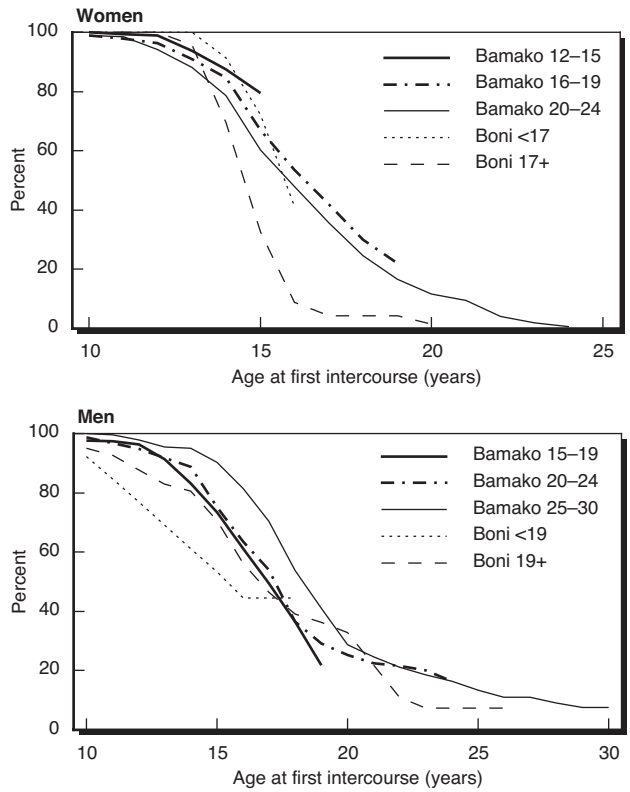
Diversity of Pace in the Sexual Transition

The trends observed in West Africa lead us to expect that in the more modern sector of the population (that is, the younger cohorts and the urban population) women will have their first experience of intercourse later and men will have it earlier than those in the more traditional sector. In accord with the results from DHS III, our data support this hypothesis, and they confirm that changes are also emerging in women's behavior. The median age at first intercourse in our Bamako sample is similar to that of the cohorts born after 1970 in the DHS sample and even slightly later among girls.

Both in our urban and rural samples, the time trend toward later sexual activity among women and earlier sexual activity among men is clear (see Figure 1). The rural–urban gradient is not straightforward, however. The earliest female sexual activity is found among the older rural cohorts. Younger women have postponed their sexual debut, which is probably linked with the new migratory habits of very young girls (Sauvain-Dugerdil and Dougnon 2006; see also Pison et al. 2001 and Lesclingand 2004). In both cohorts within the rural population, female behavior appears much more homogeneous than in the urban population.[10] Among men, the trend toward earlier sexuality is obvious in both the urban and the rural sample, but, overall, men's first intercourse occurs earlier in the rural area.

The gender gap in sexual debut is narrowing significantly. In Bamako, among young people aged 20 through 24 years (born between 1978 and 1982), 40 percent of girls and 25 percent of boys have had their first intercourse by

Figure 1 Survival estimates of age at first intercourse among women and men surveyed, by birth cohort and rural–urban residence, Mali, 2002

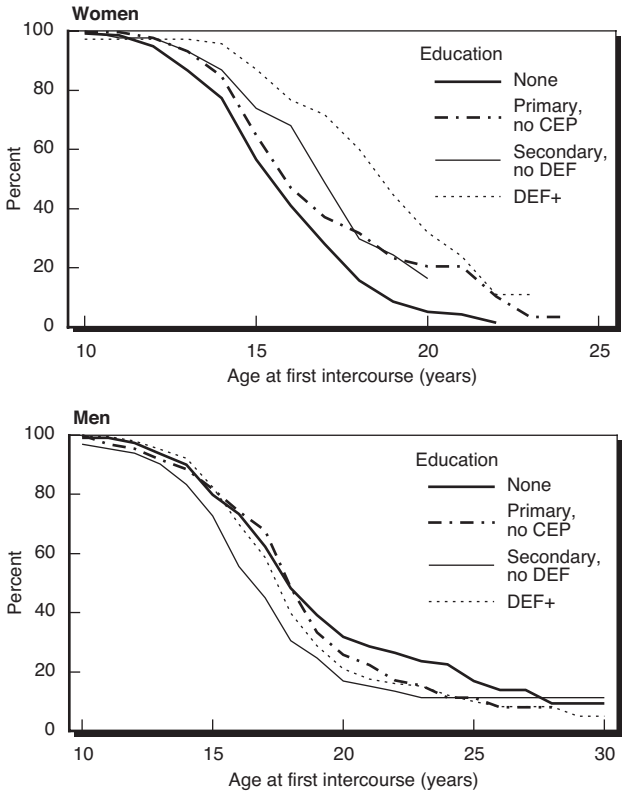


the age of 15, and the median age is 16.8 and 18.2 years, respectively. Among those aged 15–19 (born between 1981 and 1987), 33 percent of boys and 27 percent of girls have had intercourse, and median ages for the event are 17.3 and 17.9. The gender gap, therefore, has decreased from a year and a half (1.4 years) to half a year (0.6). In the rural sample, if we compare the cohorts born before 1983 with those born in 1983 or after (who were 19 years old or younger at the time of the survey), the gap has completely faded, declining from 2.1 years (from median ages of 17.6 years for men and 15.4 for women) to one-tenth of a year (to median ages of 16.4 and 16.3).

A closer look at urban–rural differences reveals that the modernization effect of the urban setting is obvious with regard to female behavior but is less clear for men (see Table 2). First intercourse appears to occur in Bamako later than in the rural area for both men and women, and in both cases women's sexual debut occurs earlier than that of men. The urban–rural difference is slightly greater among men, and the gender gap is a little larger in the urban area. For both sexes, early sexual initiation (at 15 or younger) is much less frequent in the capital city than in the rural area, especially among women. Urban women are also characterized by a higher frequency of late age at first intercourse (at 20 years or older) whereas the opposite is true for urban men. Fewer Bamako men than rural men had not experienced their first intercourse by age 20, a finding that can be considered a first sign of men's sexual transition. This urban gradient in the decrease in men's age at first intercourse is also corroborated by a slight difference among the three zones of the project in Bamako: late first experience is slightly more frequent in the peripheral zones than in Niarela, the more central zone (not shown). No such trend is seen among women.

As shown in Figure 2, age at first intercourse for women appears to vary by educational level in the expected direction: better-educated women experience a later sexual debut than less-educated woman. The effect of schooling is less clear among men. The only clear result is the higher occurrence of late age at first intercourse among men who have never attended school. Among the best-educated respondents, women's median age at first intercourse is older than that of men.

Figure 2 Survival estimates of age at first intercourse among women and men surveyed, by educational level, Bamako, Mali, 2002



CEP = Certificat d'enseignement primaire. DEF = Diplôme d'enseignement fondamentale.

In Table 3, the results of the regression analysis provide a global view of the combined effects of the factors considered. We distinguish here four analytical models. The first one considers only the joint effects of timing (relative risk of sexual debut at each age), of birth cohorts, and place of residence at the time of the sexual debut. By adding the effect of education (Model 2), the coefficient of the young women who experienced their first sex outside Mali is lowered, and the difference becomes statistically significant. The effect of schooling and other variables is not modified by the standard of living (Model 3), whereas when religious practice is introduced (Model 4), the cohort effect is no longer statistically significant.

Table 2 Percentage of women and men, by age at first sex, according to rural–urban residence, Mali, 2002

	Bamako (three zones)			Rural area (Dogon villages, Boni)			Difference Bamako–Boni		
Sex of respondents	Median age (years)	Had sex by age 15	Did not have sex by age 20	Median age (years)	Had sex by age 15	Did not have sex by age 20	Median age (years)	Had sex by age 15	Did not have sex by age 20
Women	17.2	34.4	12.9	15.9	53.3	2.8	1.3	–18.9	10.1
Men	18.5	20.8	24.7	17.0	37.6	29.7	1.5	–16.8	–5.0
Difference (M – W)	1.3	–13.6	11.8	1.1	–15.7	26.9	0.2	– 2.1	–15.1

Table 3 Multiple regression analysis of respondents' personal characteristics affecting their age at first intercourse, by sex, Mali, 2002

Characteristic	Coefficients			
	Model 1	Model 2	Model 3	Model 4
Women				
Age (years)[a]				
≤13 (r)	1.00	1.00	1.00	1.00
14–15	20.84**	21.18**	21.20**	21.20**
16–17	30.14**	32.36**	32.40**	32.40**
18+	45.51**	55.31**	55.20**	55.10**
Birth cohort				
1987–90	0.41**	0.41**	0.41**	0.42**
1983–86 (r)	1.00	1.00	1.00	1.00
1978–82	1.36**	1.38**	1.38**	1.38**
Residence[a]				
Bamako (r)	1.00	1.00	1.00	1.00
Elsewhere in Mali	0.94	0.82	0.82	0.82
Outside of Mali	0.56	0.49*	0.49*	0.49*
Education				
None (r)		1.00	1.00	1.00
Primsec[b]		0.59**	0.60**	0.60**
DEF+		0.29**	0.30**	0.30**
Standard of living				
Low			1.06	1.06
Medium			1.02	1.02
High (r)			1.00	1.00
Religious practice				
None/irregular				0.94
Regular (r)				1.00
Model				
Constant	0.01**	0.01**	0.01**	0.01**
–2 Log-likelihood	2,619.6	2,562.3	2,562.1	2,561.9
R^2 Nagelkerke	0.33	0.34	0.34	0.34
Men				
Age (years)[a]				
≤15 (r)	1.00	1.00	1.00	1.00
16–17	11.77**	11.86**	12.00**	12.20**
18–19	25.60**	25.94**	26.20**	27.10**
20+	13.62**	13.92**	14.20**	15.20**
Birth cohort				
1983–87	1.06	1.04	1.06	1.01
1978–82 (r)	1.00	1.00	1.00	1.00
1973–77	0.78*	0.79*	0.80*	0.82
Residence[a]				
Bamako (r)	1.00	1.00	1.00	1.00
Elsewhere in Mali	0.64**	0.67**	0.68**	0.68**
Outside of Mali	1.09	1.11	1.08	1.06
Education				
None (r)		1.00	1.00	1.00
Primsec[b]		1.21	1.18	1.18
DEF+		1.22	1.17	1.18
Standard of living				
Low			0.80*	0.78*
Medium			0.75*	0.75*
High (r)			1.00	1.00
Religious practice				
None/irregular				1.44**
Regular (r)				1.00
Model				
Constant	0.01**	0.01**	0.01***	0.01**
–2 Log-likelihood	3,572.8	3,569.4	3,562.5	3,549.6
R^2 Nagelkerke	0.22	0.23	0.23	0.23

*Significant at $p \leq 0.05$; **$p \leq 0.01$. (r) = Reference category.
[a] Time-varying variable. [b] Includes all those who have not passed the DEF (diplôme d'enseignement fondamentale, the diploma for completion of the first secondary level); also includes incompleted primary school.

When the effect of time (advancement in age) on the hazard rate of sexual initiation is controlled, the main outcomes are:

(1) A strong cohort effect is found among women, whereas the effect is opposite and less significant among men: The younger the female generation, the later the sexual initiation, whereas among men the two younger generations do not differ, and they distinguish themselves from the oldest one by an earlier initiation (although this cohort effect diminishes when controlling for religious practice).

(2) Sexual initiation for both males and females tends to occur later among young people who, at the time, were not living in Bamako. Among women, the delaying effect of residence is significant only for those outside of Mali; among men, the delaying effect is significant only among those living elsewhere in Mali.

(3) Educational level has a highly significant effect on postponing female first intercourse, even when controlling for standard of living. The opposite is true for men, whose sexual transition is slightly (though not statistically significantly) earlier among those who attended school.

(4) First sex occurs significantly earlier among less religious males, whereas religiosity has no effect upon female behavior.

In short, the postponement of female sexual initiation shows a strong time trend and an important educational effect; the pioneer females (that is, those whose sexual debut occurred later) are also to be found among those who have lived outside of Mali. Pioneer young men, who tend to have an earlier sexual initiation, are younger, better off, and less religious. The characteristics considered here explain the female behaviors slightly better than they do the male behaviors (34 percent and 23 percent of the total variance, respectively), which means that other factors play a role.

Age at Parenthood

The median age of women at their first pregnancy in our rural sample is close to that recorded for the timing of first childbirth for the rural population studied in the 2001 DHS (17.5 years for our young Dogon population of the area of Boni and 17.9 years among 20–24-year-old rural women interviewed for the DHS). In our Bamako sample, however, the transition to parenthood seems to differ from the DHS sample. Median age in our sample (19.7 years) is intermediate between that in Bamako and in other Malian towns represented in the DHS (other towns: 18.4 years; Bamako: 22.1, both among women aged

20–24). This difference is large enough to exclude a bias resulting from the use of distinct variables (pregnancy versus birth) to measure the transition to parenthood. It may be the result of our survey's having been conducted in poorer areas of the city.

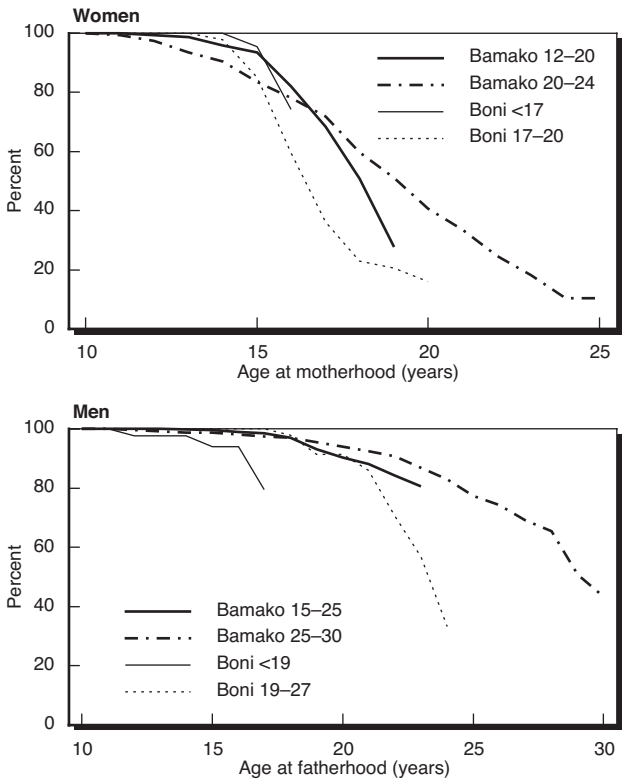
As expected from what we know in West Africa, the trends in the timing of parenthood, such as are shown by the cohort differences, fit with the thesis of a decreasing gender gap, through the postponement of women's entry into motherhood, and earlier fatherhood. Yet, the trend is more consistent among men than women and in the rural than the urban sample. In the urban population, the trend reflects the decrease in very early motherhood and a slight increase in fatherhood before 23 years (see Figure 3).

As shown in Table 4, the urban setting does not appear to be associated with a smaller gender gap in the timing of parenthood but rather implies an extended delay for fatherhood. Among women, the median age at first pregnancy is 2.2 years later in Bamako than in the rural setting; the proportion of women who are already mothers at age 20 is 21 percentage points lower in Bamako than in the rural settings. Among men, the median age of fatherhood is 5.8 years later in Bamako, where 75 percent of the urban men are not yet fathers by age 25 (43 percentage points more than in rural areas).

This rural–urban difference is enhanced by a distinction between the three urban settings: the postponement of parenthood is more marked in Niarela, especially among women (not shown). We have thus a clear periphery–center polarity that was not evident for age at first intercourse.

The five analytical models of the regression analysis, shown in Table 5, point to the interaction effects of education, standard of living, and timing of first sex. Education (added in the second model) increases the timing effect for both sexes. Standard of living (Model 3) does not change the timing or education effects among women, but diminishes the effect of higher education among men. Religiosity does not affect the influence of the other variables considered (Model 4). The timing of sexual debut influences only the effect on timing of first pregnancy for the male cohort, but is an important factor affecting other characteristics for young women: it increases the effect of age, access to schooling, and higher standard of living, while it reduces the cohort effect and that of place of residence (Model 5).

Figure 3 Survival analysis of age at parenthood among women and men surveyed, by birth cohort and rural–urban residence, Mali, 2002



The results of the regression analysis confirm a time trend for fatherhood but are not clear with regard to motherhood. Younger male cohorts experience paternity earlier than older generations, and the trend is stronger when controlling for schooling, but is reduced when adding age at first sex. Among women, the decrease in very early pregnancy shown in the survival analysis is not significant enough to influence the overall opposite trend toward earlier maternity among younger cohorts. This cohort effect, however, diminishes when controlling for education and is no longer significant when introducing the effect of age at first sex. Male and female newcomers

Table 4 Percentage of women and men, by age at first pregnancy, according to residence, Mali, 2002

	Bamako (three zones)			Rural area (Dogon villages, Boni)			Difference Bamako–Boni		
Sex of respondent	Median age (years)	Had no child by age 20	Had no child by age 25	Median age (years)	Had no child by age 20	Had no child by age 25	Median age (years)	Had no child by age 20	Had no child by age 25
Women	19.7	37.5	9.7	17.5	17.0	na	2.2	20.5	na
Men	30.0	92.2	75.4	24.2	87.7	32.0	5.8	4.5	43.4
Difference (M – W)	10.3	54.7	65.7	6.7	70.7	na	3.6	–16.0	na

na = Not available.

Table 5 Multiple regression analysis of respondents' personal characteristics associated with delayed first pregnancy, by sex, Mali

Characteristic	Coefficients				
	Model 1	Model 2	Model 3	Model 4	Model 5
Women					
Age (years)[a]					
≤ 16 (r)	1.00	1.00	1.00	1.00	1.00
17–19	15.23**	16.04**	16.15**	16.19**	22.20**
20+	22.58**	28.74**	29.05**	29.13**	52.22**
Birth cohort					
1983–90 (r)	1.00	1.00	1.00	1.00	1.00
1978–82	0.55**	0.64**	0.67**	0.64**	0.79
Residence[a]					
Bamako (r)	1.00	1.00	1.00	1.00	1.00
Elsewhere in Mali	0.64*	0.60**	0.60**	0.58**	0.57**
Outside of Mali	0.67	0.59	0.57	0.55	0.67
Education					
None (r)		1.00	1.00	1.00	1.00
Primsec[b]		0.59**	0.62**	0.65**	0.58**
DEF+		0.15**	0.17**	0.17**	0.19**
Standard of living					
Low			0.90	0.91	0.93
Medium (r)			1.00	1.00	1.00
High			0.69*	0.67*	0.60**
Religious practice					
None/irregular				0.69*	0.69**
Regular (r)				1.00	1.00
Age at first sex (years)					
≤14 (r)					1.00
15–17					0.49**
18–25					0.17**
Model					
Constant	0.02**	0.03**	0.03**	0.04**	0.06**
–2 Log-likelihood	1,920.4	1,863.1	1,857.8	1,852.0	1,781.7
R^2 Nagelkerke	0.22	0.25	0.25	0.25	0.28
Men					
Age (years)[a]					
≤ 18 (r)	1.00	1.00	1.00	1.00	1.00
19–22	29.29**	30.30**	30.33**	30.35**	31.07**
23+	73.98**	77.32**	77.61**	77.67**	79.73**
Birth cohort					
1978–87 (r)	1.00	1.00	1.00	1.00	1.00
1973–77	0.63	0.61*	0.61*	0.61*	0.66
Residence[a]					
Bamako (r)	1.00	1.00	1.00	1.00	1.00
Elsewhere in Mali	0.57	0.56	0.52	0.52	0.52
Education					
None (r)		1.00	1.00	1.00	1.00
Primsec[b]		1.02	1.12	1.11	1.13
DEF+		0.48**	0.52*	0.52*	0.53*
Standard of living					
Low			1.44	1.44	1.43
Medium (r)			1.00	1.00	1.00
High			0.99	0.99	1.00
Religious practice					
Regular (r)				1.00	1.00
None/irregular				1.01	0.99
Age at first sex (years)					
≤17 (r)					1.00
18–30					0.77
Model					
Constant	0.00**	0.00**	0.00**	0.00**	0.00**
–2 Log-likelihood	947.5	936.9	933.8	933.8	932.3
R^2 Nagelkerke	0.24	0.24	0.25	0.25	0.25

*Significant at $p \leq 0.05$; **$p \leq 0.01$. (r) = Reference category.
[a] Time-varying variable. [b] Includes all those who have not passed the DEF (diplôme d'enseignement fondamentale, the diploma for completion of the first secondary level); also includes incompleted primary school.

in Bamako (those who were living elsewhere at the time of the pregnancy) experienced parenthood later than others, and the gap increases when education is controlled for. This finding could indicate a precarious situation for potential migrants, particularly when it has not been compensated for by schooling. This precariousness may have delayed family formation and may have prompted migration to Bamako as well.

Among women, having more resources is associated with having a first child later than those with fewer resources. Age at first pregnancy is clearly related to the woman's level of schooling, and women from households with a higher standard of living are older at first pregnancy. The effect of education is only slightly diminished by adding the standard of living to the calculations. The extent to which women who have completed the first secondary level postpone motherhood is particularly striking: by age 20, no less than 85 percent are still childless, whereas only 22 percent among those who have never attended school and 36 percent of those with an intermediate level of schooling are childless (not shown). Thus, as with first intercourse, transition first occurs through initial contact with school and continues with attendance at secondary school. The effect of standard of living is not as dramatic, and is restricted to women living in households with the greatest number of commodities.

Among men, the trend seems to be in the same direction—that is, fatherhood comes later among those with greater personal resources—but the trend is much less clear than that found among women. The young men from the extreme categories distinguish themselves from others: the best-educated postpone their first child (a statistically significant association), whereas those with a lower standard of living have their first child earlier. In this case, the coefficient does not reach statistical significance, likely because the number of men who are already fathers is small. Whatever the respondents' level of education or the standard of living may be, the gender gap remains important. It is decreasing with the level of education, however: among those who have never attended school, the difference in men's and women's age at first pregnancy is 11.4 years, whereas it is 9.6 and 8.2 years among the intermediate levels and around 6 years among those with a first secondary degree (not shown).

Among women, the effect of the standard of living is increased when controlling for age at first sex; the opposite is true for men. Religiosity is linked with earlier motherhood but has no effect on the timing of fatherhood. Timing of motherhood is strongly associated with age at first sex, whereas among men the link is not significant. The regression analysis in Model 5 explains one-fourth of the variance among men, and a little more among women.

In these nonprivileged populations, no time trend for delayed motherhood is found. The postponement of first pregnancy is limited to a better-educated, better-off, and less-religious minority. In turn, late fatherhood appears to be less frequent among younger cohorts, and the time trend is clearer when controlling for schooling, because better-educated young men tend to delay the arrival of their first child. Better-off young men also tend to delay fatherhood, even when controlling for schooling.[11] Motherhood and fatherhood also occur later among those who had their first child before their arrival in the capital. The comparison with the young people in our rural sample (see Figure 3) shows that, globally, parenthood occurs later in the capital city than in these remote rural areas. Our results confirm, therefore, that, for men, the trend in the timing of family building expresses complex interactions with new values (among the younger cohorts), interactions with other life events and aspirations (among the students and the better-off), and the constraints produced by the insecurities of urban life.

The timing of motherhood remains strongly associated with the timing of sexual initiation: the later her sexual initiation, the later a woman has her first child. In particular, the cohort effect of motherhood appears to be mainly the consequence of the trend in age at first sex. The introduction of the age at first sex into the regression increases the effect of the standard of living (and that of having attended school), however. Among better-off women, a dissociation between sexual initiation and procreation may have begun. Among men, an obvious dissociation has occurred between sexual debut and procreation. We consider this issue below by analyzing the characteristics associated with the time elapsed between the first sexual experience and the arrival of the first child.

Interval Between First Intercourse and Pregnancy

A wide gender gap exists in the time elapsed between first sex and first pregnancy: for half of the men surveyed, the period between the two events was 13 years or more, whereas half of women experienced their first pregnancy less than three years after their sexual initiation.[12] In both the rural and urban samples, short intervals (less than two years among women and less than five years among men) are slightly less frequent among the younger generations. Gender differences remain important, and, as shown in Table 6, the gap is even wider in the urban sample (the median duration of the interval is 10.5 years longer among men than women) than in the rural sample (6.5 years longer among men than women). For both women and men, the interval is longer in Bamako than in the rural areas, but only slightly so for women. Among women, however, short intervals (two years or less) are much less frequent and long intervals are slightly more frequent. Thus, the dissociation between sexual activity and procreation does not appear to be a widespread phenomenon among the women interviewed in Bamako, but rather an emerging phenomenon among a minority. In turn, urban men wait longer to have a child: short intervals are less frequent and long intervals are more common. In Bamako, nearly two-thirds (63 percent) have not had a child ten years after their first intercourse, whereas 29 percent of rural men have waited this long (not shown).

The regression model accounts for a smaller proportion of the variance than that for the timing of first sex and first pregnancy, but it confirms our hypotheses (see Table 7). No time trend is found. Among women, younger cohorts do not differ significantly from older ones, whereas among men, the apparent shorter intervals of older generations disappear when controlling for the effect of age at first intercourse (Model 5). The interval was shorter because older cohorts experience later sexual initiation than do younger cohorts. The female interval is not affected by residence at the time of first pregnancy, whereas among men, intervals are shorter among those who were already living in Bamako at the time of their partner's pregnancy. This longer interval among the newcomers to the city does not reflect widespread longer intervals in rural areas (see Table 6), but seems to be specific to migrants.

The emerging dissociation of female sexual activity and procreation is clearly a behavior of better-educated and better-off women. Among women, the duration of the interval between first sex and childbirth is increasing with level of schooling attained. The difference is particularly marked among women with a secondary-school education, for whom a much lower frequency of short in-

Table 6 Percentage of women and men surveyed, by the duration of the interval between their first intercourse and first pregnancy, according to rural–urban residence, Mali 2002

	Bamako (three zones)			Rural area (Dogon villages, Boni)			Difference Bamako–Boni		
Sex of respondent	Median interval (years)	Interval ≤ two years	Interval > five years	Median interval (years)	Interval ≤ two years	Interval > five years	Median interval (years)	Interval ≤ two years	Interval > five years
Women	3.7	42.1	17.1	2.9	52.3	13.1	0.8	–10.2	4.0
Men	14.2	2.4	82.3	9.4	10.0	74.3	4.8	–7.6	8.0
Differences (M – W)	10.5	–39.7	65.2	6.5	–42.3	61.2	4.0	2.6	4.0

Table 7 Multiple regression analysis of respondents' personal characteristics affecting the length of the interval between sexual initiation and first pregnancy, by sex, Mali, 2002

Characteristic	Coefficients				
	Model 1	Model 2	Model 3	Model 4	Model 5
Women					
Interval since first sex (years)[a]					
≤1 (r)	1.00	1.00	1.00	1.00	1.00
2	1.46**	1.56*	1.58*	1.60*	1.63**
3+	1.22	1.36	1.38	1.43*	1.57***
Birth cohort					
1983–90 (r)	1.00	1.00	1.00	1.00	1.00
1978–82	0.97	1.13	1.18	1.10	0.99
Residence[a]					
Bamako (r)	1.00	1.00	1.00	1.00	1.00
Elsewhere	1.04	0.98	0.97	0.95	0.99
Education					
None (r)		1.00	1.00	1.00	1.00
Primsec[b]		0.52**	0.55**	0.59**	0.61**
DEF+		0.18**	0.18**	0.19**	0.18**
Standard of living					
Low			0.96	0.97	0.96
Medium (r)			1.00	1.00	1.00
High			0.65*	0.63**	0.63*
Religious practice					
None/irregular				0.60**	0.58**
Regular (r)					1.00
Age at first sex (years)					
≤15 (r)					1.00
16–25					1.57**
Model					
Constant	0.25**	0.31**	0.35**	0.41**	0.34**
–2 Log-likelihood	1,318.5	1,267.4	1,259.8	1,250.1	1,241.0
R^2 Nagelkerke	0.01	0.07	0.08	0.09	0.10
Men					
Interval since first sex (years)[a]					
≤ 2 (r)	1.00	1.00	1.00	1.00	1.00
3–5	2.99**	3.00**	3.01**	3.01**	3.15***
6+	3.86**	3.82**	3.84**	3.82**	4.51***
Birth cohort					
1978–87 (r)	1.00	1.00	1.00	1.00	1.00
1973–77	1.46	1.44	1.45	1.43	1.09
Residence[a]					
Bamako (r)	1.00	1.00	1.00	1.00	1.00
Elsewhere	0.51	0.48*	0.44*	0.44*	0.47*
Education					
None (r)		1.00	1.00	1.00	1.00
Primsec[b]		0.89	0.97	1.00	0.98
DEF+		0.52*	0.55*	0.55*	0.51*
Standard of living					
Low			1.54	1.56	1.65*
Medium			1.06	1.07	1.06
High (r)			1.00	1.00	1.00
Religious practice					
None/irregular				0.85	0.89
Regular (r)				1.00	1.00
Age at first sex (years)					
≤17 (r)					1.00
18–30					1.91**
Model					
Constant	0.01**	0.01**	0.01**	0.01**	0.01**
–2 Log-likelihood	909.0	901.6	897.6	897.1	888.5
R^2 Nagelkerke	0.04	0.05	0.06	0.06	0.07

*Significant at $p \leq 0.05$; **$p \leq 0.01$. (r) = Reference category.
[a] Time-varying variable. [b] Includes all those who have not passed the DEF (diplôme d'enseignement fondamentale, the diploma for completion of the first secondary level); also includes incompleted primary school.

tervals is found (only 16 percent report an interval shorter than two years, whereas short intervals were reported by 28 percent and 35 percent of those who finished primary school and did not finish it, respectively, and by 53 percent of those who never attended school) (not shown). Women with intervals lasting longer than two years are also much more frequently found in households with a higher standard of living. The influence of personal resources is not so clear among men. Those with the highest level of education and living in better-off households appear to have slightly longer intervals. These men were also more likely to have been childless at the time of the survey than those with less education who were living in poorer households, although they had been sexually active for more than 13 years (not shown).

Women and men who practiced their religion more frequently are found to have a shorter interval between sexual initiation and first pregnancy (the association is strong and significant among women, but not significant among men). Among both women and men, a strong association with the timing of first sex is seen (later age at first sex is associated with a shorter interval between first sex and first childbirth), and the timing of first sex slightly diminishes the effect of female standard of living and increases that of men.

In short, among women, sexual activity remains closely associated with procreation, even in the younger cohorts. The postponement of sexual initiation, which can be understood as a pioneer behavior, is not associated systematically with a longer period of sexual activity before procreation. A longer interval is found even among a minority of girls who experienced an early sexual initiation but who have the means to protect themselves from an unwanted pregnancy. Dissociation between sexual activity and procreation is found among the better-educated, better-off, and less-religious women in Bamako. Among men, a period of several years of sexual activity before fatherhood is not new, but it is a much longer period among the young people interviewed in Bamako than among the small, isolated, traditional Dogon population in northern Mali. In Bamako, especially among the better-educated, better-off, and less-religious young men, this period is even longer. A long interval should not, therefore, be considered as a sign of economic constraint impeding the building of a family, but rather a new behavior linked to earlier sexual debut.

Discussion: Risks Associated with the Start of the Sexual Transition

Our data show that the sexual transition is beginning in Mali even among the nonprivileged sectors of the popula-

tion from which our sample was drawn. Clearly, the transition is not exclusively urban; in an early stage it is beginning to appear among the remote rural population included in our research. In the rural areas, the transition is probably linked to the increasing mobility of young people, even very young girls (Sauvain-Dugerdil and Dougnon 2006). Yet, whereas a clear trend can be discerned in the timing of sexual initiation, no such trend is evident for first pregnancy or the dissociation between the beginning of sexual activity and procreation. Even among the younger cohorts, these new behaviors are restricted to pioneer groups.

Among women, the traditions of early sexual debut and early motherhood are diminishing, but sexual activity remains strongly associated with procreation. The younger generations are experiencing an overall trend toward later sexual initiation. Although early motherhood is becoming less frequent, no overall significant rise in the age at first childbirth is found. More than a cohort effect, later motherhood and the dissociation between sexual activity and procreation seem to be emergent behaviors among better-educated, better-off, and less-religious young women.

Consequently, the question arises whether these emerging behaviors should be considered risky. Therefore, we examined the possible association between the timing of first sex and parenthood and vulnerability in terms of risky sexual behavior (multiple partners, casual sex, and unprotected sex) and of unfavorable conditions attending first pregnancy (occurring outside of marriage, declared as unwanted, or associated with negative changes).

The results for women show a strong association between early sexual debut and risky sexual behavior (see Appendix Table A1). This association is maintained (and even increases for women) when controlling for the effect of personal characteristics (age, education, standard of living, religiosity, and place of residence during childhood). Yet, a higher standard of living and religiosity are also associated with slightly less vulnerability, although the decreased risk does not reach the level of statistical significance.

Later motherhood appears to take place in more favorable conditions than early motherhood (risk is 1.6 times higher when the first pregnancy occurs before 18 years, as shown in Appendix Table A2). Both later sexual debut and a dissociation between sexual initiation and procreation seem to have the opposite effect, however, increasing the vulnerability associated with the conditions of first pregnancy. This vulnerability seems to be associated with the urban context: it is found nearly two times more frequently among young women who have always been in Bamako compared with those who have lived most of their childhood elsewhere. To a lesser—and statistically insignificant—extent, religiosity is associated with less vulnerability and schooling with greater vulnerability among women.

Among men, as would be expected in the context of a tradition of late male sexual initiation and fatherhood, the time trend is opposite to that of females. Younger generations experience an earlier sexual debut and, to a lesser degree, earlier fatherhood. As a consequence, the interval between first sex and procreation is becoming longer for men. Yet, the time trend is less important than that for women and is not straightforward with regard to age at fatherhood and the interval between first sex and procreation. Earlier sexual debut is found among younger cohorts, the better-off, the less-religious, and those residing in Bamako or outside of Mali at the time of the survey. Earlier fatherhood is also found among younger generations resident in Bamako, but the effect of their level of schooling and standard of living is the opposite. Longer time at school and a higher standard of living seem to delay the arrival of the first child. Thus, in this case, the delay of fatherhood cannot be attributed to economic constraints such as often seems to be the case in African cities (Hertrich 2001). It corresponds rather to urban behavior of better-off students who experience a longer period of sexual activity before the arrival of their first child. More than a cohort effect, however, the timing of first sex influences the duration of the interval (earlier sex is associated with a longer interval among men regardless of their generation).

New habits in earlier sex and fatherhood appear to bring with them greater vulnerability, as shown in the appendix tables. Men engage in risky sexual behaviors more frequently when their sexual initiation occurs early.[13] This sexual vulnerability appears to be associated with smoking and drinking habits and is positively associated with educational level. The risk of having a first child in unfavorable conditions is higher when fatherhood occurs earlier, but is independent of the duration of sexual activity before fatherhood. This risk is also associated with smoking and drinking habits. It is much lower among more religious young men and seems to be somewhat (though not statistically significantly) higher among young men with the lowest and the highest standards of living.

Conclusion

This study provides indicators of the links between sexual transition, the modernization of Malian society, and sociocultural and economic trends. We can summarize the main findings in the light of the evolution of Malian society from four standpoints: the role of urbanization, religiosity, individual resources (in terms of both standard of living and education), and gender differences.

Is Pioneer Behavior an Urban Lifestyle?

In Mali, which remains largely a rural country, urbanization is just beginning, but migration from the countryside to the city is a fast-growing phenomenon. Many indicators show that changes in behavior—such as increased female education, lower fertility, and incipient use of modern contraceptives—are first found in the capital city. Our data from the less-privileged parts of Bamako reveal complex differences between urban and rural lifestyles. Among women, pioneer behavior is clearly an urban phenomenon, but differences between rural and urban life patterns are fading in younger cohorts. Among men, the new trend toward an earlier sexual transition is not specifically urban. Despite the less-frequent occurrence of late sexual initiation and a slight increase in early fatherhood (before age 23), in Bamako the transition is occurring later than it is among the Dogon of Boni. Moreover, a long period of male sexual activity before procreation is found in the urban setting.

New city dwellers appear to have particular experiences that suggest especially precarious situations. Migrants of both sexes have had their sexual debut and their first child later than those who have always lived in Bamako. Migrant women are less likely, however, to suffer unfavorable conditions surrounding the arrival of their first child.[14]

Do Religious Values Restrain Sexual Transition?

The majority of the young people interviewed declare themselves to be regularly practicing Muslims. Yet, a significant minority of young people declare that they do not practice Islam regularly or at all. This finding may reflect the varying degree of Islamization among different ethnic groups as well as a new polarization between less religious strata and more radical ones. The impact of this increasing polarization is important to consider in terms of the influence of religiosity on the course of sexual transition. Our results show that religiosity appears to play a significant but not systematic role. Among women, religiosity has no effect on the timing of sexual debut, but it seems to impede the postponement of procreation. Motherhood among those who state that they practice religion regularly occurs earlier, and pregnancy follows shortly after first sex. Among men, the new trend toward earlier first sex is to be found among the less religious, but religiosity does not affect the timing of procreation. Religiosity is associated with less risky female sexual behaviors but does not influence women's vulnerability to unfavorable conditions surrounding the arrival of their first child. Religiosity has no effect on male vulnerability.

Are New Behaviors Related to Economic Status and Schooling?

Among women, the sexual transition is clearly associated with privilege. Increased resources, however, have complex effects on the adoption of risky behaviors. A higher standard of living is associated with later motherhood, preceded by a longer period of sexual activity. The better-off also engage less often in risky sexual behaviors. With regard to the vulnerability associated with unfavorable conditions surrounding first pregnancy, women from both the lowest (in particular) and the highest social levels are at greatest risk. Among women, education and duration of schooling play major roles in the postponement of sexual debut and first childbirth and in the dissociation between sexual activity and procreation. Both the first contact with school and achieving a higher educational level have significant effects on delaying entry into intimate relationships and the start of family life. Our results are also consistent with previous research indicating that the risky behaviors are associated with the opening of new horizons engendered by school attendance. Schooling and its duration are associated with slightly increased vulnerability in terms of risky sexual behavior and unfavorable conditions surrounding first childhood. Yet, younger cohorts, regardless of their level of schooling, appear to be less vulnerable to engaging in risky sexual behavior. A higher risk is found of having their first child in unfavorable conditions, however.

The male sexual transition is found among the better-off, but having greater resources is associated with very late fatherhood for those with a higher standard of living, and especially for those with a higher level of schooling. Men who have attended school adopt risky sexual behaviors more frequently than nonstudents, but this vulnerability is slightly higher among the young men with the lowest standard of living. In turn, a higher education seems to reduce the risk of unfavorable conditions surrounding fatherhood. As is the case for women, socioeconomic level has a U effect: the poorest and (even more) the best-off are the most vulnerable.

Does Sexual Transition Foster Gender Equity?

The gender gap in median age at first intercourse is shrinking as a consequence of the opposite trends toward earlier male and later female sexual debut. Even in the isolated rural population that we studied, the difference between the sexes in age at sexual debut is disappearing. In Bamako, among the best-educated, the gap is reversed: boys' age at first sex is younger than that of girls. Later sexual debut and motherhood are certainly conditions for women's empowerment. Moreover, our results show that the later

the sexual transition, the lower the probability of individuals' engaging in risky behavior or experiencing unfavorable conditions at first pregnancy. The decrease and even reversal of the average age differences between partners could be expected to result in more equitable relationships. Our data include no information about the characteristics of the respondent's first sexual partner, however, and, as is the case in many settings, earlier male initiation may well occur with older women or commercial sex workers. Our data indicate that male sexual debut currently occurs earlier than in the past, and that earlier first sex is more often linked with multiple partners, casual sex, and unprotected sex, none of which are indications of greater gender equity. The gender gap in age at parenthood is diminishing only slightly among younger cohorts, and remains significant, especially in the urban setting where fatherhood is delayed. The persistence of a strong gender divide is confirmed by our analysis, published elsewhere, of time-use data, not only with regard to the respondent's type of activities, but also with regard to the place where they occur (Sauvain-Dugerdil and Dieng 2004; Sauvain-Dugerdil and Ritschard 2005; Sauvain-Dugerdil forthcoming). Young women have less free time than do young men, and their activities remain primarily within the home and the family circle, whereas for young boys, interaction with peers is paramount. The minority of women who enjoy significant free time are privileged and better educated. Their free time is not associated with risky sexual behavior. Among boys, free time is not always associated with engaging in risky sexual behavior, but this is clearly the case among the better-off, who state that they go out at night.

In short, this analysis shows a contrasting image of the risks engendered by the sexual transition. Among women, this transition appears to be the expression of new opportunities for the better off and the better educated. Among men, in contrast, the current trend of an early sexual debut appears to bring with it more frequent risky behavior, especially among those who attended school but belong to the lower socioeconomic strata. Therefore, schooling appears to play a complex role that can be considered both as the path for female empowerment and the spawning ground of risky behavior in a context of lessened family control but also of sexual strategies employed to obtain material and symbolic goods (Grange and Reysoo 2008). Entering and remaining in school are central factors in the decline of females' very early entry into sexual activity and procreation. In this sense, education is certainly a powerful driver of female empowerment. We have seen, however, that the new windows of opportunity opened by schooling may also result in increased risky behavior. Schooling provides an opportunity insofar as it implies access to wider personal resources enabling the student to better control risky habits. Therefore, the democratization of schooling will be a means of empowering young people and diminishing gender inequalities only if it also provides the impetus to inhibit sexual risk-taking.

Appendix

Table A1 Multiple regression analysis of respondents' personal characteristics affecting their vulnerability to engage in risky sexual behavior, by sex, Mali, 2002

	Coefficients			
Characteristic	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Women				
First sex				
Early (< 16 years)	1.90**	2.24**	2.23**	2.28**
Not early (r)	1.00	1.00	1.00	1.00
Age group (years)				
12–15		0.45	0.44	0.45
16–19 (r)		1.00	1.00	1.00
20–24		1.23	1.27	1.39
Education				
None		0.70	0.65	0.68
< Primary (r)		1.00	1.00	1.00
At least primary		1.21	1.27	1.27
Standard of living				
Low			0.93	0.90
Medium (r)			1.00	1.00
High			0.62	0.63
Religious practice				
Regular				0.61
Irregular or none (r)				1.00
Residence during childhood				
Bamako (r)				1.00
Elsewhere in Mali				1.07
Outside Mali				1.35
Constant	0.44**	0.43**	0.52	0.64
R^2 Nagelkerke	0.032	0.063	0.074	0.09
Men				
First sex				
Early (< 18 years)	1.96**	1.82**	1.82**	1.84**
Not early (r)	1.00	1.00	1.00	1.00
Age group (years)				
15–19		1.05	1.01	1.09
20–24 (r)		1.00	1.00	1.00
25–29		0.87	0.89	0.88
Education				
None		0.57*	0.54*	0.53*
< Primary (r)		1.00	1.00	1.00
At least primary		0.88	0.87	0.91
Standard of living				
Low			1.36	1.37
Medium (r)			1.00	1.00
High			0.98	0.95
Religious practice				
Regular			0.97	1.00
Irregular or none (r)			1.00	1.00
Residence during childhood				
Bamako (r)			0.70	1.00
Elsewhere in Mali			1.00	0.74
Outside Mali			1.00	0.98
Vulnerability to addiction				1.88*
Constant	1.39*	1.93*	2.01	1.66
R^2 Nagelkerke	0.034	0.052	0.064	0.081

*Significant at $p \leq 0.05$; ** $p \leq 0.01$. (r) = Reference category.

Table A2 Multiple regression analysis of respondents' personal characteristics affecting their vulnerability to an unfavorable context surrounding entry into parenthood, by sex, Mali, 2002

Characteristic	Coefficients				
	Model 1	Model 2	Model 3	Model 4	Model 5
Women					
Interval between first sex and first childbirth					
Short (< 3 years)	0.79	0.64	0.64	0.67	0.64
Not short (r)	1.00	1.00	1.00	1.00	1.00
First sex					
Early (< 16 years)	0.88	0.69	0.65	0.65	0.64
Not early (r)	1.00	1.00	1.00	1.00	1.00
First child					
Early (< 18 years)		1.52	1.55	1.53	1.57
Not early (r)		1.00	1.00	1.00	1.00
Age group (years)					
< 21			1.58	1.47	1.46
21+ (r)			1.00	1.00	1.00
Education					
None			0.55	0.59	0.63
< Primary (r)			1.00	1.00	1.00
At least primary			1.58	1.56	1.51
Standard of living					
Low			1.57	1.47	1.48
Medium (r)			1.00	1.00	1.00
High			1.31	1.33	1.24
Religious practice					
Irregular				0.65	0.65
None (r)				1.00	1.00
Residence during childhood					
Bamako					1.80*
Elsewhere (r)					1.00
Constant	0.47**	0.50*	0.41	0.55	0.38
R^2 Nagelkerke	0.004	0.011	0.078	0.088	0.107
Men					
Interval between first sex and first childbirth					
Short (< 6 years)	1.99	1.23	1.23	1.10	1.44
Not short (r)	1.00	1.00	1.00	1.00	1.00
First sex					
Early (< 18 years)	1.10	0.77	0.78	0.61	0.85
Not early (r)	1.00	1.00	1.00	1.00	1.00
First child					
Early (< 24 years)		2.33	2.30	2.40	1.98
Not early (r)		1.00	1.00	1.00	1.00
Age group (years)					
< 26			1.03	0.69	0.58
26+ (r)			1.00	1.00	1.00
Education					
None			1.26	0.93	0.92
< Primary (r)			1.00	1.00	1.00
At least primary			1.14	0.77	0.70
Standard of living					
Low			1.21	1.83	1.47
Medium (r)			1.00	1.00	1.00
High			1.30	2.03	1.99
Religious practice					
Irregular				0.21**	0.22**
None (r)				1.00	1.00
Residence during childhood					
Bamako					1.27
Elsewhere (r)					1.00
Vulnerability to addiction					2.97*
Constant	0.53	0.52	0.38	1.30	0.83
R^2 Nagelkerke	0.035	0.065	0.071	0.185	0.238

*Significant at $p \leq 0.05$; ** $p \leq 0.01$. (r) = Reference category.

Notes

1 Severe problems remain concerning the quality and accessibility of schooling, which contributes to the widening of the gender gap (for example, great distances to schools in settings where girls lack access to bicycles). Caution must be exercised, therefore, regarding the use of schooling as an indicator of development.

2 DHS III (2001) does not provide information on men's age at first childbirth.

3 The *Chantier Jeunes* project is a partnership initiated by three Malian institutions: the Faculty of Medicine and the Institut Supérieur de Formation et de Recherche Appliquées (ISFRA) of the University of Mali, the Institut National de Recherche en Santé Publique of the Ministry of Health (INRSP), and the Laboratoire de Démographie et d'Etudes Familiales of the University of Geneva. In 2005, the research unit of the Direction Nationale de la Population (DNP) also joined the project. The present phase of the project (2005–08) is supported by a joint program of the National Swiss Fund for Scientific Research and the Swiss Development cooperative agreement between Swiss and third-world researchers.

4 The survey questionnaire was pretested with a qualitative pilot phase in 2000–01.

5 In Bandiagara Coura, all households were visited, whereas in the four sectors of Sicoroni and in Niarela a systematic sampling of households was taken, street by street.

6 This distrust expresses young people's questioning the authority of the traditional leaders, who agreed to welcome the research team to the villages where the senior Swiss researcher had conducted fieldwork in the 1970s. Qualitative research was conducted there in 2004, 2006, 2007, and 2008, and proved to be a better approach than the quantitative one for establishing a relationship of trust and for understanding behavioral change. The information gleaned has been the object of two studies (Sauvain-Dugerdil and Dougnon 2006 and Sauvain-Dugerdil et al. 2008) and a master's thesis, and is still being analyzed.

7 The questions focused on pregnancy rather than birth so as to obtain information about miscarriage, which was found to occur in 10 percent of first pregnancies (and 9 percent of all pregnancies).

8 The settings are referred to in a few instances where pertinent.

9 The survey question is: *Est-ce que la venue de votre premier enfant a changé quelque chose: dans vos activités—dans votre emploi du temps, dans votre place dans la famille, dans votre relation avec votre mari/copain?* (Did the arrival of your first child change anything—your activities, your use of time, your position in your family, your relationship with your husband/partner?) For each item, whenever yes: "How?"

10 The apparent homogeneity may, however, be the result of inaccurate responses to questions about age at first intercourse.

11 The results are nearly identical when the order of entry of the variables "education" and "standard of living" are inverted in the regression analysis.

12 An interval of one year or less is counted here as one year.

13 Early first sex seems to have the opposite effect of lowering the vulnerability associated with the conditions surrounding the arrival of the first child.

14 This advantage exists even when the timing of motherhood is controlled; it is not simply a consequence of the association between later motherhood and a lesser degree of vulnerability.

References

Aduayi-Diop, Rosalie. 2003. "Les facteurs de fragilisation et les stratégies de survie des adolescentes à Dakar." Paper presented at the Fourth African Population Conference, Tunis, 8–13 December.

Agwanda, Alfred O., Philippe Bocquier, Anne Khasakhala, and Samuel Owuor. 2004. "The effect of economic crisis on youth precariousness in Nairobi: An analysis of itinerary to adulthood of three generations of men and women." *Développement, Institutions & Analyses de Long terme (DIAL) Working Paper* No. DT/2004/04. Paris: DIAL.

Ahlberg, Beth Maina. 1994. "Is there a distinct African sexuality? A critical response to Caldwell." *Africa: Journal of the International African Institute* 64(2): 220–241.

Amit-Talai, Vered and Helena Wulff (eds.). 1995. *Youth Cultures: A Cross-cultural Perspective*. London: Routledge.

Antoine, Philippe and Jeanne Nanitelamio. 1990. "La montée du célibat féminin dans les villes africaines. Trois cas: Pikine, Abidjan et Brazzaville." *Les Dossiers du CEPED*, No. 12. Paris: Centre Français sur la Population et le Développement .

Antoine, Philippe, Eva Lelièvre, and groupe de réflexion sur l'approche biographique (eds.). 2006. *Etats Flous et Trajectoires Complexes: Observation, Modélisation, Interprétation*. Paris: Institut Nationale d'Etudes Démographiques.

Antoine, Philippe, Dieudonné Ouédraogo, and Victor Piché (eds.). 1998. *Trois Générations de Citadins au Sahel: Trente ans d'Histoire Sociale à Dakar et à Bamako*. Paris: L'Harmattan.

Antoine, Philippe, M. Razafindrakoto, and F. Roubaud. 2001. "Contraint de rester jeunes? Évolution de l'insertion dans trois capitales africaines: Dakar, Yaoundé, Antananarivo." In *Autrepart: Les Jeunes, Hantise de L'espace Public dans les Sociétés du Sud?* La Tour-d'Aigues, France: Editions de l'Aube.

Berthé, Fatou. 2005. "Vulnérabilité des jeunes liée aux pratiques et comportements néfastes à la santé en milieu urbain et péri-urbain bamakois." Thèse Faculté de médecine, de pharmacie et d'odontostomatologie. Mali: Université de Bamako.

Berthé, Fatou, Claudine Sauvain-Dugerdil, and Abdoul A. Dieng. 2005. "Devenir adulte dans un monde en transformation: La vulnérabilité des jeunes maliens liée aux pratiques et aux comportements néfastes à la santé." Paper presented at the XXV International Population Conference of the International Union for the Scientific Study of Population, Tours, France, 18–23 July.

Bledsoe, Caroline and Barney Cohen (eds.). 1993. *Social Dynamics of Adolescent Fertility in Sub-Saharan Africa*. Washington, DC: National Academies Press.

Blossfeld, Hans-Peter. 1995. "Changes in the process of family formation and women's growing economic independence: A comparison of nine countries." In *The New Role of Women. Family Formation in Modern Societies*. Ed. Hans-Peter Blossfeld. Boulder, CO: Westview Press. Pp. 3–32.

Bongaarts, John. 2007. "Late marriage and the HIV epidemic in sub-Saharan Africa." *Population Studies* 61(1): 73–83.

Bongaarts, John and Barney Cohen (eds.). 1998. "Introduction and overview: Adolescent reproductive behavior in the developing world (special issue)." *Studies in Family Planning* 29(2): 99–105.

Bozon, Michel and Véronique Hertrich. 2001. "Rapports de genre et initiation sexuelle en Afrique et en Amérique latine. Une comparaison de vingt enquêtes EDS." Paper presented at the International Colloquium on Gender, Population, and Development in Africa. Abidjan, Côte d'Ivoire, 6–21 July.

Bumpass, Larry. 1990. "What's happening to family? Interactions between demographic and institutional changes." *Demography* 27(4): 483–498.

Caldwell, John C., Pat Caldwell, Bruce K. Caldwell, and Indrani Pieris. 1998. "The construction of adolescence in a changing world: Implications for sexuality, reproduction, and marriage." *Studies in Family Planning* 29(2): 137–153.

Calvès, Anne E., Michel Bozon, Alioune Diagne, and Mathias Kuépié. 2006. "La passage à l'âge adulte: Repenser la définition et l'analyse des 'premières fois.'" In *Etats Flous et Trajectoires Complexes. Observation, Modélisation, Interprétation*. Eds. Philippe Antoine, Eva Lelièvre, and Groupe de réflexion sue l'approche biographique. Paris: Institut National d'Etudes Démographiques. Pp. 137–156.

Centre Français sur la Population et le Développement (CERPOD). 1996. "Etude régionale sur la santé de la reproduction des adolescents dans le Sahel. « Focus groups » et interviews individuels au Burkina Faso, au Mali, au Niger." *Série Rapport de Recherche* 5(1). Bamako, Mali: Institut du Sahel.

Charlot, Bernard and Dominique Glasman (eds.) 1998. "Les jeunes, l'insertion, l'emploi." *Collection "Pédagogie d'Aujourd'hui."* Paris: Presses Universitaire de France.

Clark, Shelley. 2004. "Early marriage and HIV risks in sub-Saharan Africa." *Studies in Family Planning* 35(3): 149–160.

Cosio-Zavala, Maria Eugenia. 2001. "Les deux modèles de transition démographique en Amérique latine : le malthusianisme de pauvreté." In *Les transitions démographiques des pays du Sud*. Eds. Francis Gendreau and Maud Poupard. Paris: Aupelf-Uref, Editions Estem. Pp. 41–52.

d'Almeida-Topor, Hélène, Catherine Coquery-Vidrovitch, Odile Goerg, and Françoise Guitart (eds.). 1992. *Les Jeunes en Afrique*. Paris: L'Harmattan.

Delaunay, Valérie. 1994. "L'entrée en vie féconde, expression démographique des mutations socio-économiques d'un milieu rural sénégalais." *Les Études du CEPED*, No. 7. Paris: Centre Français sur la Population et le Développement.

———. 1998. "Sexualité et fécondité des adolescents: évolutions récentes en milieu rural sénégalais." Presentation at Les Troisièmes Journées Scientifiques seminar on "Transitions démographiques des pays du Sud," sponsored by L'Agence Universitaire de la Francophonie (AUF) and l'Institut National de Statistique et d'Economie Appliquée (INSEA). Rabat, Morocco, 9–13 December.

Galland, Olivier. 1991. *Sociologie de la Jeunesse*. Paris: Armand Colin.

Gendreau, Francis (ed.). 1998. *Crise, Pauvreté et Changements Démographiques dans les Pays du Sud*. Paris: AUPELF-UREF/Éditions ESTEM.

Gokalp, Catherine. 1981. " Quand vient l'âge des choix. Enquête auprès des jeunes de 18 à 25 ans: Emploi, résidence, mariage." Paris: INED/PUF.

Grange, Françoise and Fenneke Reysoo (eds.). 2008. "Chic, chèque, choc. Transactions autour des corps et stratégies amoureuses contemporaines." Actes du 11e Colloque International Genre, Genève. Geneva: Institut universitaire d'études du développement (IUED), collection Yvonne Preiswerk.

Guillaume, Agnès. 2000. "Abortion in Africa: A birth control method and a public health issue." *The CEPED News* No. 8, July–December 4. Paris: Centre Français sur la Population et le Développement.

Guillaume, Agnès and Myriam Khlat. 2002. "Santé et droits de la réproduction au temps du Sida: La situation dans les pays du Sud." Paper presented at the Commission on Population and Development, 35th session, New York, United Nations, 1–5 April.

Hertrich, Véronique. 1996. "Permanences et changements de l'Afrique rurale : Dynamiques familiales chez les Bwa du Mali." *Les Etudes du CEPED* No. 14. Paris: Centre Français sur la Population et le Développement.

———. 2001. "Nuptialité et rapports de genre en Afrique. Un premier bilan des tendances de l'entrée en union au cours des quarante dernières années." Paper presented at the International Colloquium on Gender, Population, and Development in Africa. Abidjan, Côte d'Ivoire, 16–21 July.

Hertrich, Véronique and Marie Lesclingand. 2001. "Entrée dans l'âge adulte en milieu rural africain: Vers une convergence des trajectoires masculines et féminines ? La cas des Bwa du Mali." Paper presented at the XXIV General Population Conference of the International Union for the Scientific Study of Population, Salvador, Brazil, 18–24 August.

Kleiner-Bossaller, Anke. 1992. "No youth for Haoussa women? Social and medical implications of early marriage." In *Les Jeunes en Afrique. Tome 1: Évolution et Role (XIXe-XXe siècles).* Eds. Hélène d'Almeida-Topor, Catherine Coquery-Vidrovitch, Odile Goerg, and Françoise Guitart. Paris: L'Harmattan. Pp. 116–129.

Lauras-Locoh, Thérèse and N. Lopez-Escartin. 1992. "Jeunesse et démographie en Afrique." In *Les Jeunes en Afrique. Tome 1: Évolution et Role (XIXe-XXe siècles).* Eds. Hélène d'Almeida-Topor, Catherine Coquery-Vidrovitch, Odile Goerg, and Françoise Guitart. Paris: L'Harmattan. Pp. 66–82.

LeGrand, Thomas K. and S.M. Cheikh Mbacké. 1993. "Teenage pregnancy and child health in the urban Sahel." *Studies in Family Planning* 24(3): 137–149.

Lesclingand, Marie. 2004. "Nouvelles pratiques migratoires féminines et redéfinition des systèmes de genre: Une analyse à partir des changements démographiques en milieu rural malien." Paris: Institut d'études politiques. Doctoral dissertation.

Locoh, Thérèse. 1995. "Familles africaines, population et qualité de vie." *Les Dossiers du CEPED* No. 31. Paris: Centre Français sur la Population et le Développement.

Locoh, Thérèse and Myriam Mouvagha-Sow. 2005. "Nouvelles perspectives pour les familles africaines." Paper presented at the XXV International Population Conference of the International Union for the Scientific Study of Population, Tours, France, 18–23 July.

Marcoux, Richard. 1994. "Le travail ou l'école: L'activité des enfants et les caractéristiques des ménages en milieu urbain au Mali." Bamako, Mali: *Etudes et travaux du CERPOD* No. 12.

Mensch, Barbara S., Daniel Bagah, Wesley H. Clark, and Fred Binka. 1999. "The changing nature of adolescence in the Kassena-Nankana district of northern Ghana." *Studies in Family Planning* 30(2): 95–111.

Mensch, Barbara S., Monica J. Grant, and Ann K. Blanc. 2006. "The changing context of sexual initiation in sub-Saharan Africa." *Population and Development Review* 32(4): 699–727.

Mouvagha-Sow, Myriam. 2002. "Processus matrimoniaux et procréation à Libreville (Gabon)." University of Paris X - Nanterre. Doctoral dissertation.

Pison, Gilles, Catherine Enel, Alexis Gabadinho, et al. 2001. "Migrations saisonnières, sexualité et fécondité. Une étude de cas dans la zone rurale de Mlomp, au Sénégal." International Colloquium on Gender, Population, and Development in Africa. Abidjan, Côte d'Ivoire. 16–21 July.

Preel, Bertrand and Hervé Le Bras. 1995. "Les jeunes dans le monde." *Les documents de travail du Sénat*. Paris: Sénat.

Rondeau, Charles. 1992. "Le statut des jeunes femmes dans trois sociétés rurales du Mali: Perception de leur rôle et évolution sur trois générations (1940–1990)." In *Les Jeunes en Afrique. Tome 1: Évolution et Role (XIXe-XXe siècles).* Eds. Hélène d'Almeida-Topor, Catherine Coquery-Vidrovitch, Odile Goerg, and Françoise Guitart. Paris: L'Harmattan. Pp. 209–224.

Rossier, Clémentine. 2003. "Estimating induced abortion rates: A review." *Studies in Family Planning* 34(2): 87–102.

Sauvain-Dugerdil, Claudine. 1980. "Quelques aspects de la biologie évolutive de deux isolats: Indiens maya de San Antonio Palopó (Guatémala), Dogon du Sarnyéré (Mali)." Geneva: Université de Genève. Doctoral dissertation.

———. 2002. "Les Dogon du Sarnyéré: La fin de l'autosuffisance. La précarité d'une société en transition dans un contexte hostile." In *Rapport de mission, Enquête de base*, August–November 2002.

———. 2002. "Quels outils pour explorer la nouvelle culture-jeunes? L'application des associations verbales à l'étude de la qualité de vie et du rôle des parents chez les jeunes maliens." 11th Colloquium of the Association Internationale des Démographes de Langue Français. Dakar, Senegal, 10–13 December.

———. 2004. "Risques et opportunités de l'utilisation du temps non structuré dans un contexte de précarité croissante. Enquête auprès de jeunes bamakoisés." Paper presented at the International Association for Time Use Research, Annual Conference, Rome, 27–29 October.

———. Forthcoming. "Un samedi à Bamako. L'émergence d'une nouvelle culture-jeunes à travers l'utilisation du temps non structuré, avec la collaboration de Gilbert Ritschard." In *Ouvrage en Hommage à Thérèse Locoh*. Ed. J. Vallin. Paris: Institut Nationale d'Etudes Démographiques.

Sauvain-Dugerdil, Claudine and Denis Dougnon. 2006. "La mobilité, une dimension multiforme d'adaptation à la précarité. L'exemple de 150 ans d'histoire des Dogon du Sarnyéré." Paper presented at the International Symposium on "Stratégies de population et stratégies de développement: Convergences ou divergences?" Dakar, Senegal, 24–27 July.

Sauvain-Dugerdil, Claudine and Gilbert Ritschard. 2005. "Temps non structuré et espaces de vie: Risques ou opportunités d'une nouvelle liberté? Enquête auprès de jeunes maliens." Paper presented at the XXV International Population Conference of the International Union for the Scientific Study of Population, Tours, France, 18–23 July.

Sauvain-Dugerdil, Claudine, Denis Dougnon, and Samba Diop. Forthcoming. "La mobilité est-elle le moteur de la transition culturelle?" *Etude micro-démographique du Sarnyéré Dogon (Mali)*. Paper delivered at the Colloque international AIDELF. Québec, September 2008.

Spencer, Paul. 2005. "The natural substructure of age systems and the social construction of ageing." In *Human Clocks: The Bio-Cultural Meanings of Age*. Eds. Claudine Sauvain-Dugerdil, Henri Leridon, and Nicholas Mascie-Taylor. New York: Peter Lang Publishing. Pp. 225–244.

United Nations (UN). 1994. Report of the International Conference on Population and Development. Cairo, September. A/Conf.171/13. New York: UN.

Villeneuve-Gokalp, Catherine. 1997. "Le départ de chez les parents: Définitions d'un processus complexe." *Economie et Statistique* 4/5(304-305): 149–162.

Westoff, Charles, Ann K. Blanc, and Laura Nyblade. 1994. "Marriage and entry into parenthood." *DHS Comparative Studies* No. 10. Calverton, MD: Macro International.

WHO, UNFPA, and UNICEF. 1997. "Action for adolescent health. Towards a common agenda. Recommendations from a joint study group." Geneva: WHO/FRH/ADH/97.9.

Young, Christabel M. 1987. *Young People Leaving Home in Australia: The Trend Towards Independence*. Canberra: Australian National University Printing Press.