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Fertility transition in Dakar, Nairobi and Ouagadougou since the 1970s: a similar decline at all ages?

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Short abstract (n=156)

The pattern of the African fertility decline remains in debate: while some researchers expect a transition similar to the declines in Europe, Latin America and Asia, where limitation practices and long-acting methods played a major role, others believe that the African transition will be different. This paper places itself in this debate: it aims to test Caldwell's prediction that African fertility declines will occur similarly at all ages, by the adoption of modern contraceptives also at all ages. We look at Dakar, Nairobi and Ouagadougou, three African urban contexts of relatively low fertility, where women have around three children in 2010-2015, using data available for these cities since the early 1970s. Caldwell et al.'s hypothesis that African fertility transitions will be characterized by similar fertility reductions at all ages is confirmed for these three cities, but contraception has not been the main strategy to expand the avoidance of childbearing in all cities and at all ages.

Introduction

While all other regions have already completed their fertility transition, SSA is the only part of the world that continues its transition at a slow pace: the average number of children remains high (5.1 2010-2015) (Casterline, 2001; Bongaarts et Casterline, 2013; UN, 2015). However, there is a wide disparity across the continent, with the decline being closely linked to wealth, urban residence, and especially high levels of education (Kravdal, 2002; Bongaarts, 2003; Gurmu and Macer, 2008; Shapiro and Gebreselassie, 2009; Assefa and Semahegn, 2016, National Academies of Sciences, Engeneering, and Medicine, 2016).

Knodel (1977), comparing the declines in marital fertility in 10 historical populations from Europe and Quebec to those in 14 Asian countries in the mid-20th century, finds that when fertility declines, the limitation of the number of children becomes widespread, and motherhood becomes less frequent at later ages. The same finding of the key role of limitation is made for the fertility declines in Southeast Asia by Hirschman and Young (2000) and in East Asia by Freeney (1994) and Freedman (1979). The fertility decline in Latin America and the Caribbean seem also to have been achieved by women limiting childbearing at older age (Juarez and Gayet, 2015). However, female sterilization has played a central role in the Asian and Latin American contexts (Hosseni et al, 2014; Joshi et al, 2015).

While fertility declines in Europe, Asia and Latin America have thus been attributed mainly to limitation and to the use of modern often long-acting (IUD, sterilization) contraception at the end of reproductive life in Asia and Latin America, Caldwell, Orubuloye and Caldwell (1992) believe that the transition of fertility will be different in SSA. For them, SSA will have a demographic transition marked by contraceptive use and a decline in childbearing at all ages. Pre-marital sexuality remained throughout the transition under close social control in Europe, Asia and Latin America (Knodel, 1977; Caldwell, Orubuloye and Caldwell, 1992; Juarez and Gayet, 2015). Based on the relative acceptance of pre-marital sexuality in SSA, Caldwell, Orubuloye and Caldwell (1992) estimate that young unmarried women would seek contraceptives to prevent early pregnancies in order to escape forced marriage as a consequence, leading to an increase in the age at marriage. Since Africa is pro-natalist and characterized by a tradition of long birth spacing (Westoff and Bankole, 2000; Locoh, 2003; Locoh et al, 2005, Bongaarts and Casterline, 2013; Timaeus and Moultrie, 2008, 2012, 2013), they believe that married women will use contraception to extend the intervals further. Finally, they believe that there are several reasons, including economic reasons, that should encourage a change in behaviour in relation to birth stopping, and lead African couples to want smaller families. However, despite all these reasons to believe that fertility would indeed decline at all reproductive ages in SSA, Bongaarts and Casterline (2013), comparing the contribution of women aged 30 and over to the average number of children at similar times in the demographic transition in Latin America, Asia and Africa, find no difference between SSA and the two other regions.

Caldwell et al. postulated the adoption of modern methods at all ages, 1) among young people to postpone entry into maternity, 2) at middle ages to space childbearing, and 3) at the end of the fertile life to stop it. However, contraception is not the only possibly way to reduce fertility. Bongaarts (1978) identified three other factors that can have massive effects on the level of general fertility, and could play an important role in any fertility transition: the proportion of married women (a proxy od sexual exposure), the prevalence of induced abortion and postpartum insusceptibility. Stover (1998) proposed some modifications to Bongaarts' (1978) model, the most important of which is the replacement of the proportion of married women by the proportion of sexually active women (outside and in marriage).

The first objective of this paper is to test the hypothesis of Caldwell, Orubuloye and Caldwell (1992) who predict a similarity in the fertility decline at all ages in SSA, in the case of three capital cities have today reached low levels of fertility. The second objective of this paper is to measure the impact of

the intermediate factors close to fertility at different ages and to detect the most influential ones for each life stage, and the changes during the course of the fertility decline in three SAA cities.

Data and methods

Data used in this paper are mainly from DHS of Dakar (capital of Senegal), Ouagadougou (capital of Burkina Faso) and Nairobi (capital of Kenya) wich TFRs are between 2.9 and 3.3. DHS began in 1984 in Kenya, 1986 in Senegal and 1993 in Burkina Faso. The last DHS conducted in Senegal dates from 2016 (DHS-continues), that of Kenya from 2014 and that of Burkina Faso from 2010. In order to extend the length of the Burkina Faso series over the recent period, particularly for the first question, we use data from the Ouagadougou Population Observatory (OPO)[1]. OPO is located in the northern part of Ouagadougou and is not representative of the city, but the fertility level in 2009-2010 (TFR of 3.1) is close to that of 2008-2010 in the 2010 DHS (3.4 children per woman). Moreover, while old data are almost non-existent for Ouagadougou, a step back in time is possible for Dakar and Nairobi through the 1970/1971 l'enquête démographique nationale (EDN) in Senegal (Ferry, 1976) and the 1979 Census in Kenya as well as the 1977/1978 Kenyan Fertility Survey (KFS).

To answer the question on the similarity of fertility decline at all ages, we calculated age-specific fertility rates and TFRs over the last 5 years preceding each survey. We then adapted the Bongaarts and Casterline (2013) method to five-year age groups. The answer to the second question required the use of Stover's (1998) model on DHS data in the early 1990s and late 2000s. The indices estimated by age are: sexual exposure, postpartum insusceptibility and contraception. Infertility is not a birth control strategy and its effect is now limited (Bongaarts, 2015), has been included in the model but the results are not discussed.

Results

- The contribution to the TFR of the different ages remains constant over time in the three cities. The values of the ratios (contribution at period t over contribution at the reference period) are concentrated around 1; the few values outside the 0.5-2 range are due to age errors, the fertility of this age groups has varied lot compared to the following and previous ones (Figure 1).
- In the late 2000s, sexual inactivity is highest before age 25 in all three cities, followed by women aged 40 and over in Dakar and those aged 45 and over in Ouagadougou and Nairobi. It reduces fertility by 3 children in Ouaga and Nairobi and by 4.5 in Dakar (Table 1). The transformations between 1990 and 2010 were the increase of sexual inactivity among the youngest (except in Dakar where adolescent girls are very abstinent at first), as expected. Surprisingly, the increase of sexual inactivity also affected women of middle age in Ouaga and Nairobi, and women of middle and older ages in Dakar; sexual inactivity only decreased among older women in Ouaga and Nairobi (Figure 2).
- By the end of 2010, the protection of insusceptibility is equally distributed among different ages in Dakar (where this determinant has the greatest impact); in Ouaga and Nairobi this factor protects more at young and middle ages (before 35 or 30 years). This factor reduces fertility by 2.1 children in Dakar, 2.0 in Ouaga and 1.3 in Nairobi (Table 1). Between 1990 and 2010 the protective effect of insusceptibility decreased at all ages in Ouaga, and after 30 years in Nairobi and Dakar as expected. But, surprisingly, this effect has strengthened or remained stable over the past 20 years before age 30 in Nairobi and Dakar (Figure 3).

[1] (http://www.issp.bf/index.php/recherche/observatoire-de-population-de-ouagadougou

- In the late 2000s, the effect of contraception on fertility is almost identical at all ages in Ouagadougou except for the 30-34 age group, where it is more pronounced, and in Nairobi for the 30-44 age group. In Dakar, the reduction effect is more important at the middle ages 25-40 years (this was also the case in 1990). In 2010, It reduces fertility by 1.8 children in Dakar, 2.8 in Ouaga and 4.1 in Nairobi (Table 1). Significant progress between 1990 and 2010 in Ouagadougou and Nairobi was made among adolescent girls, while in Dakar they do not yet benefit from this protection. The most striking result is the minimal increase in contraception at other ages in the three capitals between 1990 and 2010 (Figure 4).

Altogether, these results confirm Caldwell et al.'s hypothesis in the case of these three capital cities that African fertility transitions will be characterized by similar fertility reductions at all ages. However, contraception has not been the main strategy to expand the avoidance of childbearing in all cities and at all ages, at least during the 1990-2010 period. We observe that the effect on fertility of postpartum insusceptibility was reinforced before age 30 in Nairobi and Dakar during these two decades, as well as that the effect of sexual inactivity before age 40 in all cities. The effect of contraception increased only at young ages in Nairobi and Ouagadougou.

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Figure 1. Ratio of the proportion contributing to TFR of each age in different periods to the proportion contributing to TFR at a reference date (Dakar & Ouaga : 1988-1992, Nairobi : 1984-1988).

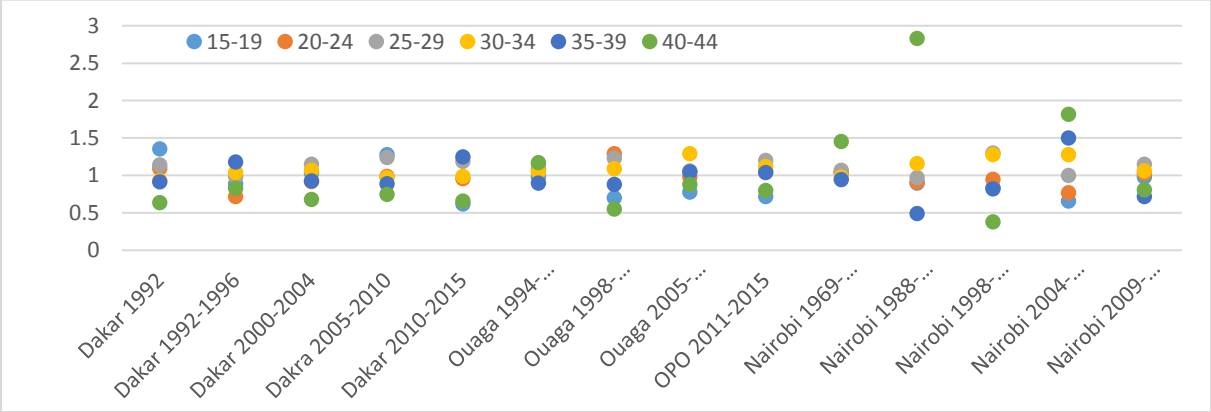

Figure 2: trend of the proportion of sexually active women (or pregnant or postpartum abstainers) in Dakar, Ouaga and Nairobi

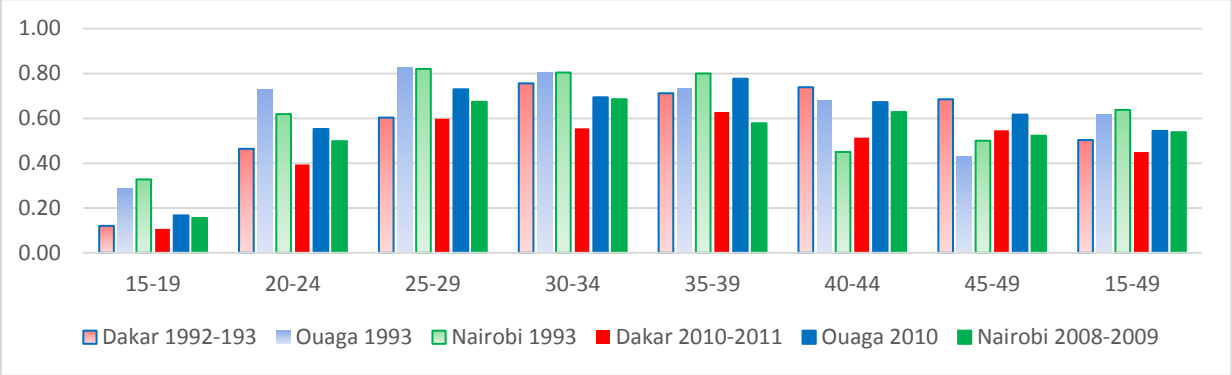

Figure 3: Trend of postpartum insusceptibility index in Dakar, Ouaga and Nairobi

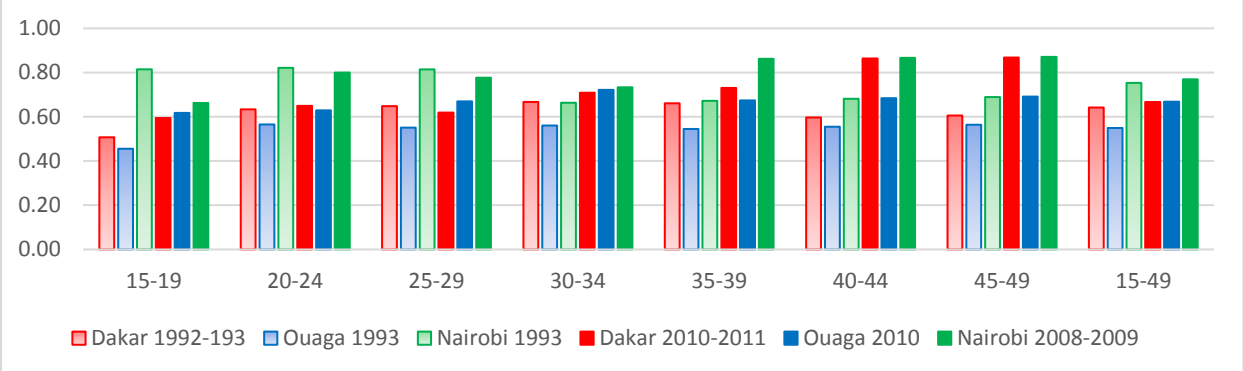

Figure 4: Trend of contraceptive index in Dakar, Ouaga and Nairobi

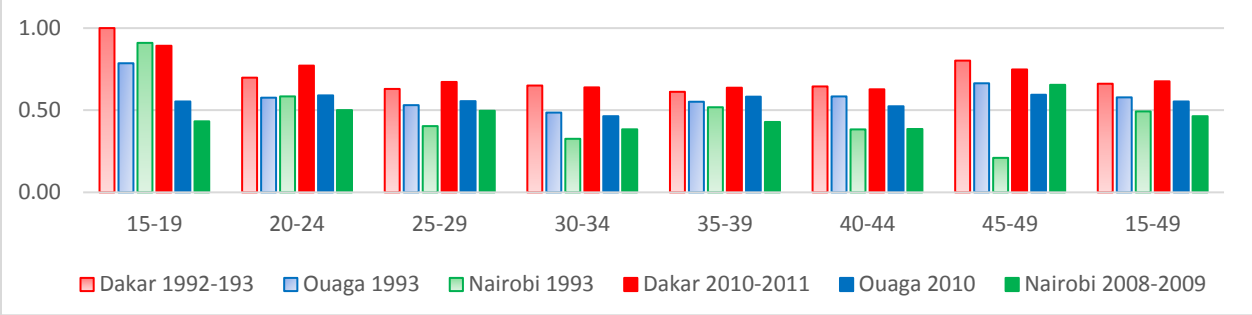

Table 1: Reducing effects of proximate determinants of fertility and TFR estimation

DHS	TFR estimated (Stover)	TFR measured	Gap	TFR without considerd each reduicing factor				Reducing TFR by each factor when effects of others are taken			
		(3 years)		Cx	Ci	Cf	Cu	Cx	Ci	Cf	Cu
Dakar 1992-193	4	4,8	-0,8	7,9	6,2	4,5	6	3,9	2,2	0,5	2
Ouaga 1993	3,8	4,2	-0,4	6,2	7	4,1	6,6	2,4	3,1	0,3	2,8
Nairobi 1993	4,4	3,4	1	6,8	5,8	5	8,9	2,5	1,4	0,6	4,5
Dakar 2010 -2011	3,9	3,6	0,3	8,2	5,8	4	5,4	4,5	2,1	0,4	1,8
Ouaga 2010	3,7	3,4	0,3	6,5	5,5	4	6,4	3	2	0,5	2,8
Nairobi 2008-2009	3,7	2,8	0,9	6,5	4,8	3,8	7,6	3	1,3	0,3	4,1

Cx : proportion of sexually active women

Ci : post-partum insusceptibility index

Cf : index of sterility

Cu : index of contraception