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WOMEN'S WORK AND FERTILITY IN A SUB-SAHARAN URBAN SETTING: A SOCIAL ENVIRONMENT APPROACH

VICTOR AGADJANIAN

Department of Sociology, Arizona State University, Tempe, Arizona, 85287-2101, USA

Summary. Data from three separate studies conducted in Maputo, Mozambique, in 1993 are used to analyse the relationship between the type of social environment in which women work and their fertility and contraceptive use. The analysis finds that women who work in more collectivized environments have fewer children and are more likely to use modern contraception than women who work in more individualized milieus and those who do not work outside the home. Most of these differences persist in multivariate tests. It is argued that collectivized work environments are most conducive to diffusion and legitimation of reproductive innovations. In contrast, individualized environments tend to isolate women and therefore may retard their acceptance of innovative fertility-related behaviour.

Introduction

Whereas the negative association between women's work and their fertility in developed countries is generally accepted in the literature, studies of the work–fertility relationship in developing settings have produced more ambiguous results (Lloyd, 1991; Poirier, Piché & Neill, 1989; Standing, 1983; United Nations, 1985). It has been proposed that in the developing world the negative relationship between women's employment and fertility levels is only present when higher status occupations of the urban formal sector are considered (Oppong, 1983; Shapiro & Tambashe, 1997; Singh & Casterline, 1985). The association was noted to be especially problematic in sub-Saharan countries (Adepoju & Oppong, 1994; Ware, 1977). Contraceptive use, in particular, has not shown any clear relationship with participation in the workforce net of women's education (Lesthaeghe *et al*., 1989; Shapiro & Tambashe, 1994).

Despite the remaining controversies and unknowns about the effect of labour force participation on fertility, the interest of researchers in this problem seems to have subsided in recent years. The decline of interest in the work–fertility relationship has been mirrored, and to some extent driven, by the reduced attention in the Demographic and Health Surveys (DHSs) – a major survey series being conducted in the developing world – to work-related issues compared with the earlier implemented World Fertility Surveys (Lloyd, 1991). This study represents an attempt to bring the work–fertility

problem back to the centre of the analysis of reproductive and contraceptive behaviour by suggesting and testing a new conceptualization of the relationship between labour force participation and reproduction. It draws on extensive and diverse data collected in Greater Maputo, the capital and largest city of Mozambique, in 1993.

The relationship between women's participation in the paid labour force and their fertility and contraceptive behaviour is commonly conceptualized in two ways. The first main perspective emphasizes the opportunity costs of childbearing, focusing on how the prospects for career advancement and for higher income may depress women's fertility. The second perspective centres on the work–childcare conflict, postulating that the less flexible a woman's work schedule and arrangements are, the more difficult it is for her to provide adequate care for her child(ren), and therefore the more likely she is to try to limit her fertility (Lloyd, 1991).

While not denying the viability of the above approaches, this study proposes to shift the focus from women's individual labour force experiences, constraints and expectations to the role of the social environment in which women work in shaping and transmitting innovative reproductive information, preferences and behaviour. From this perspective, working also means being in a particular sort of social environment and interacting and exchanging information and ideas with other people in that environment. Other things being equal, the environment with the higher frequency and density of interaction will be more conducive to exchange and adoption of innovative information. In the proposed conceptualization, therefore, the workplace is seen as a meeting place, a venue for interaction. Primary importance is given to the exposure to interaction at work rather than to the type of work itself: to being and interacting in the workplace rather than to working.

Several important qualifications are, however, in order. First, the interaction through which attitudinal and behavioural (including reproductive) innovations are circulated is not work-related. Even in work settings most conducive to such interaction work tasks and processes are usually individualized. Women's interaction occurs primarily during the time when they are in the workplace but are *not* working: for example, during lunch or other breaks, right before and after work. Therefore, workplaces that allow for more and longer pauses have the best potential for information exchanges. Second, such informal interaction, unrelated to work, is most intense and effective in a non-competitive environment. Thus market vendors may share the same facility and even co-ordinate their business but the competitive nature of their work tends to impede their interaction with other vendors (excluding kin) beyond what is absolutely necessary for their business activity. And third, interaction initiated in the workplace setting may extend outside of it. This further extension of women's social networks may considerably expand their sociocultural and informational horizons and ultimately bring greater benefits, in terms of reproductive behaviour, than the workplace interaction *per se*.

In this study workplace environments are subdivided into two types: collectivized and individualized. This dichotomy is used mainly for analytical convenience and should not obscure the continuous nature of this scale in the real world. In reality, practically all economic activities outside the household give women some exposure to interaction with others. Thus, for example, a woman who sells at a market is usually more exposed to informal interaction than one who hawks from a street corner, even

though both are defined here as individualized workers. Yet when compared with the collectivized environment of office employees, for example, the interaction potential of both groups of vendors is considerably reduced.

The environment-based definitions of work types used in this study overlap with more conventional definitions: formal versus informal, modern versus transitional versus traditional, or white collar versus blue collar. These overlaps, however, are limited, and each of the two types of work environment contains a diverse range of occupations. For example, clerical employees and factory workers are both considered occupations with a high interactive potential, but so is a self-employed hairdresser because of the type and intensity of her interaction with customers.

Large urban areas, characterized by a much greater diversity of work settings and a greater variety of reproductive behaviours and outcomes than rural areas, offer particularly interesting material for an analysis of the work–fertility relationships. Greater Maputo, one of the fastest growing cities of sub-Saharan Africa situated in the southernmost part of Mozambique, is used in this study as an example. Maputo has many features of a typical sub-Saharan city: a swelling population, great ethnocultural diversity, sprawling shantytowns, widespread poverty, gender inequality and limited social and economic opportunities for women. The city's socioeconomic and demographic dynamics have been strongly imprinted by the political, social and economic cataclysms of Mozambique's history in the past 30 years. The city has seen overt discrimination against and exploitation of the majority of its population in the colonial period (until Mozambique's independence from Portugal in 1975); large-scale nationalizations and other socialist reforms in the early independent period (the second half of the 1970s); generalized impoverishment and the degradation of urban infrastructure as an indirect result of a brutal civil war and a direct result of economic and administrative mismanagement (the 1980s), and the political and structural adjustment reforms, initiated in the late 1980s. This recent political dialogue and structural adjustment have brought peace and economic upturn, but at the same time increased social inequality and nearly obliterated the meagre social safety net created by the state during the socialist years.

Amid shrinking government subsidies for education, health care, state-owned enterprises and consumer goods, the free state-run family planning system is one of the few enduring legacies of socialism. Since its inception in the late 1970s, organized family planning has always had more resources and achieved greater coverage in the capital city than elsewhere in Mozambique (National Directorate of Statistics & Ministry of Health, 1993, pp. 70–71). Thus, according to a survey conducted in 1987, the prevalence of modern contraception (including sterilization) in Maputo was 15·2%, compared with 12·7% in urban areas in general, and only 3·7% in rural regions where the war did not preclude data collection (Monreal, 1991, section 7.1). Ten years later, the Demographic and Health Survey estimated the modern contraceptive prevalence among women in marital unions in Maputo at 28·5% – considerably higher than the 5·1% in the country as a whole (National Institute of Statistics & Macro International, 1997).

Differences in contraceptive use mirror those in fertility levels. The estimates of the 1987 survey put the birth rate in Maputo at 36·9 per thousand, compared with 52·5 in accessible rural areas (Monreal, 1991, section 3.11). Another survey, conducted in 1991

among a small sample of women in some peri-urban areas of Maputo, estimated the total fertility rate at 4·8 children per woman (Graham *et al.*, 1991, p. 22). And the 1997 DHS estimated the city total fertility rate at 4·0 compared with 5·6 in Mozambique as a whole (National Institute of Statistics & Macro International, 1997).

Data and methods

This analysis uses data from three studies conducted in Maputo in 1993 as part of a large project on reproductive and contraceptive behaviour. One study surveyed 1585 married or cohabiting women, residing permanently in Greater Maputo, who had recently given birth to their second or higher-order child in any of the six city maternity clinics or had brought their new-borns delivered elsewhere to those clinics for registration and vaccination. The survey sample can be considered representative of the female urban population with these characteristics because the overwhelming majority of Maputo women either deliver their babies in a medical institution or, in the case of an outside birth, take their babies there for registration and vaccination (National Directorate of Statistics, 1993, p. 161). The survey instrument included questions on women's origin and migration history, area of residence, education, ethnocultural characteristics, reproductive and contraceptive background, marriage and marital partners, characteristics of their children, workforce participation, income and material conditions. Hereafter this survey will be referred to as the Married Women Survey.

The second study was conducted among family planning users. This survey included 2020 exit interviews with contraceptive users – initiating, continuing and resuming – randomly selected at five family planning clinics of Maputo: one in the central city, the so-called *cidade de cimento* (literally, the cement city), and four clinics in the city's suburban fringe, or *cidade de caniço* (the reed city). Since almost all of the three main contraceptive methods used in Maputo – oral contraceptives, the IUD and injections (usually of Depo-Provera) – were distributed through the state-owned family planning clinics, the sample of this survey is representative of the city's family planning users. The respondents were asked about their origin and area of residence, education, participation in the workforce, marital history and current status, reproductive and contraceptive background, and about number, age and sex of their children. In the following text this survey will be referred to as the Clinic Survey.

The objective of the third study was to focus more closely on women's workplace environment and interaction. The study interviewed women who belonged to three of the most typical female occupational categories: clerical workers, factory workers and market vendors. These women were interviewed at one of the national ministries, a medium-sized textile factory and at two marketplaces: one on the immediate fringe of the cement city and one in the heart of the reed city. In total, 215 women aged 18 to 49 were interviewed, of whom 26 were ministry employees, 80 factory workers and 109 vendors (35 at the cement-city and 74 at the reed-city marketplaces). According to the proposed occupational classification, both the factory workers and ministry employees worked in collectivized work environments, whereas market vendors' environment is considered more individualized.

The interview typically included two parts: a standard questionnaire with close-ended questions, similar to those in the other two surveys, and a more loosely

structured conversation on issues related to childbearing and family planning. The interviews were complemented by participant observation of women's interaction in each of the three workplace environments. Thus the strategy of this study was intended not only to generate data for statistical analysis but also to offer some insight into the dynamics of women's interaction in the workplace which would complement the statistical tests of the two other surveys. This study and the survey that constitutes its main part will be subsequently referred to as the Workplace Study and Workplace Survey.

Despite some limitations of the collected information, such as their mainly cross-sectional nature and the relatively small sample size of the Workplace Survey, the triangulation of the resulting sets of data provides a unique opportunity to examine the same issues by approaching them from different angles and focusing on different segments of the city's female population.

Standard occupational categories, adapted to the Maputo sociocultural context, are used in the coding of the data to ensure the comparability of the three surveys. According to the proposed conceptualization and based on ethnographic observations of different types of workplaces, all women are grouped into three categories: not working outside the home for income, working in an individualized environment and working in a collectivized environment. The collectivized environment category also includes full-time students because the school or university setting is believed to catalyse the same type of informal interaction as paid employment in collectivized occupations.

The three occupational categories are first compared with regard to their main sociodemographic reproductive characteristics. In order to examine the net effect of the type of occupational environment on fertility and contraception the multivariate tools of statistical analysis, such as ordinary least squares (OLS) regression and logistic regression, are employed. In the multivariate models, women in two working categories are compared with non-working women, while statistically controlling for relevant sociodemographic variables. In the analysis of the Workplace Study data, results of the statistical tests are complemented with information from ethnographic observations.

Results

Fertility, contraception and work environment of married women

Table 1 presents summary statistics for selected variables of the Married Women Survey. Of all 1585 survey respondents, 69·5% did not report any work for income. This is very close to the rate of 69·0% reported in the 1991 National Demographic Survey (NDS) for all women aged between 15 and 49 residing in the city of Maputo (calculated from unpublished NDS data), although it is possile that due to the well-known difficulty in defining sub-Saharan women's workforce participation, both surveys underestimated women's employment, especially in some secondary and irregular occupations. Among those respondents who reported working for income, the majority – 72·5% (22·7% of the total sample) – reported an activity that could be classified as individualized, and the rest (7·8% of the total sample) were collectivized workers. Characteristically, 90·6% of individualized workers were market or street sellers of produce and prepared food. In comparison, 59·0% of the collectivized

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Table 1. Selected sociodemographic characteristics by work environment, Married Women Survey, Maputo, 1993

Characteristic	Work environment			
	Individualized ($n=360$)	Collectivized ($n=124$)	Not working ($n=1101$)	Total ($N=1585$)
Mean age (SD)	28·3 (5·5)	29·9 (4·2)	27·5 (5·5)	27·8 (5·5)
Mean number of living children (SD)	3·0 (1·75)	2·5 (1·4)	2·8 (1·8)	2·8 (1·8)
Mean level of education (SD)	3·3 (2·2)	7·0 (2·6)	3·5 (2·6)	3·7 (2·7)
Born in a city, %	38·6	58·9	42·4	42·9
Lives in a peripheral *bairro*, %	51·1	53·2	57·2	55·5
Household owns a radio, %	76·9	88·7	73·9	75·7
Current union is not the first, %	31·7	38·7	23·9	26·8
Polygynous union, %	26·9	15·3	17·7	19·6
Ever used western contraception, %	23·1	67·7	27·6	29·7
Ever used the pill (% of ever-users)	37·8	34·9	38·8	38·0
Ever used the IUD (% of ever-users)	11·0	39·8	26·0	25·8
Ever used the injection (% of ever-users)	51·2	36·1	39·8	41·2
Percentage of total	22·7	7·8	69·5	100·0

SD, standard deviation.

subsample can be classified as white-collar workers, mainly office clerks in the public or private sectors.

Although collectivized workers were on average older than individualized workers, their mean number of children was lower. Differences in urban experience and education may help to explain these disparities. Collectivized workers had the highest share of those who were born in a city. Workers in collectivized environments were the best educated on average: their level of educational attainment was more than twice that of individualized workers. If ownership of a transistor radio is taken as a sign of the family's material status, collectivized workers again have a considerable advantage over individualized ones. Based on these characteristics, individualized workers were more similar to non-working women than collectivized workers. The differences between the two working groups were also noticeable in the share of women whose current marital union was not their first, and especially in the prevalence of polygyny. On the other hand, no major differences among the three categories of women could be observed in the area of residence: all three had similar breakdowns between those who resided in a central part of Maputo – the cement city and its immediate surroundings – and those who lived in the vast peri-urban reed city.

Collectivized workers were unquestionably leaders in contraceptive use, with more than two-thirds of them having tried a western family planning method. (Since the survey was conducted shortly after childbirth, information on current use of family planning was not collected.) In contrast, the share of ever-users of contraceptives among individualized workers was three times lower – in fact, the lowest among the

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three categories of women. Individualized workers also had a markedly higher share of ever-users of injectable contraception than the other two groups.

The multivariate analysis focuses on the number of living children and contraceptive experience at any moment in life. Accordingly, two statistical models are constructed: an OLS regression with the number of children as the response variable and a logistic regression predicting the odds of having ever used an effective western contraceptive. Both models use type of work environment as the explanatory variable, with not working as the reference category, and control for age, educational level, urban versus rural origin, area of residence, material status approximated by radio ownership and marital characteristics. In addition to this set of control variables, the model predicting the number of children also controls for previous contraceptive use and the ever-use of contraception model controls for the number of children and for whether the respondent had at least one son prior to the recent birth. The results for these analyses are shown in Table 2.

The first column of Table 2 contains the parameter estimates for the OLS regression of the number of children. Although the estimates for both individualized and collectivized types of work have negative signs, only the collectivized work setting shows a significant effect on the number of children. Thus, compared with not working, a collectivized environment is more conducive to lower fertility than is a more individualized environment. Notably, this effect of type of work environment on the number of children is net of such traditionally powerful predictors of fertility as education, urbanism and contraceptive experience.

The results of the logistic regression model used to test the net association between the probability of ever-use of a modern contraceptive and type of employment are quite instructive. Whereas collectivized work significantly increases the likelihood of having used contraceptives in relation to not working, individualized work seems, on the contrary, to *diminish* this likelihood. How should these results be interpreted? The contraceptive 'advantage' of working in a more collectivized environment may indeed derive from the density and frequency of cultural information exchange. In contrast, individualized working conditions do not provide favourable conditions for such networks to develop and may in fact isolate women from the flows of innovative information, even compared with non-working women.

Work environment of family planning users

Tables 3 and 4 show the bivariate statistics and results of the multivariate tests respectively, for the analysis of the survey conducted among the users of family planning clinics. In all, 42·9% of women were working outside their homes or studying, a higher proportion than among ever-users of contraceptives in the Married Women Survey, due in part to a larger share of students in the Clinic Survey sample. When the working subsample is broken down by type of occupation, almost two-thirds of the respondents fall into the collectivized category.

As in the Married Women Survey, the vast majority (83·4%) of individualized workers in the Clinic Survey were market or street sellers. Among collectivized workers, those who could be classified as white-collar occupations constituted 72·1%. This share was higher than that found in the Married Women Survey (59·0%), but also

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Table 2. Multivariate analyses of number of children and contraceptive use, Married Women Survey, Maputo, 1993

Variable	Number of children (OLS regression) β	SE	Ever-use of contraception (logistic regression) β	SE
Work environment				
Not working (ref.)				
Individualized	−0·021	0·068	−0·327*	0·152
Collectivized	−0·421**	0·117	0·677**	0·234
Age	0·235**	0·006	0·052**	0·018
Number of children	—		0·040	0·056
Education	−0·152**	0·013	0·270**	0·031
Place of birth				
Rural area or town (ref.)				
City	0·106**	0·032	0·263**	0·068
Area of residence				
A central *bairro* (ref.)				
A peripheral *bairro*	0·130*	0·057	−0·374**	0·122
Household radio ownership				
Household owns no radio (ref.)				
Household owns a radio	−0·011	0·068	0·163	0·155
Order of current marriage				
First (ref.)				
Not first	−0·115	0·066	0·392**	0·140
Type of marital union				
Monogamous (ref.)				
Polygynous	−0·108	0·073	0·119	0·158
Experience with modern contraception				
Never used (ref.)				
Used at least once	0·076	0·066	—	
Sons prior to last birth				
At least one son (ref.)				
No sons	—		−0·407**	0·157
Constant	−3·337		—	
R^2	0·63		—	
−2 log likelihood	—		1652	
Number of observations	1566		1566	

(ref.), reference category; SE, standard error; *$p<0·05$; **$p<0·01$; —, not used or not applicable.

higher than this proportion among the collectivized workers in that survey who had ever used contraceptives (61·1%). As in the Married Women Survey, collectivized workers in the Clinic Survey had the highest average educational attainment, 7·5 years, followed by non-working women, 4·9 years, with individualized workers having the lowest level of schooling, 4·3 years.

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Table 3. Selected sociodemographic characteristics by work environment, Clinic Survey, Maputo, 1993

Characteristic	Work environment			
	Individualized ($n=297$)	Collectivized ($n=552$)	Not working ($n=1129$)	Total ($N=1978$)
Mean age (SD)	27·7 (6·6)	27·3 (6·7)	26·2 (6·3)	26·8 (6·5)
Mean number of living children (SD)	3·1 (1·9)	2·0 (1·7)	2·8 (2·0)	2·6 (1·9)
Mean level of education (SD)	4·3 (2·0)	7·5 (2·1)	4·9 (2·3)	5·5 (2·6)
Born in a city, %	43·1	62·7	54·5	55·1
Lives in a peripheral *bairro*, %	55·9	32·4	59·3	42·9
Ever married, %	81·5	61·8	86·0	78·6
Lives with husband or partner, %	75·8	54·9	82·6	73·8
Mean number of children at 1st contraception (SD)	2·9 (2·2)	1·5 (1·5)	2·6 (2·1)	2·3 (2·1)
Mean number of months since last birth (SD)[a]	31·7 (23·9)	40·3 (31·2)	26·0 (22·3)	30·3 (25·6)
Ever used the pill, %	60·6	68·7	69·7	68·0
Ever used IUD, %	30·0	46·4	26·0	32·3
Ever used the injection, %	35·0	29·4	26·8	28·7
Ever used all three methods, %	2·7	7·6	2·4	3·9
Current pill user, %	55·2	59·1	65·3	62·1
Current IUD user, %	16·8	24·5	13·9	17·3
Current injection user, %	28·0	16·3	20·7	20·5
Percent of total	15·0	27·9	57·1	100·0

SD, standard deviation; [a]nulliparous women excluded.

Women who worked in collectivized settings had a lower mean number of children than non-working respondents (2·0 versus 2·8), despite being more than a year older on average. On the other hand, individualized workers had the highest number of children (3·1), even though their average age was similar to that of collectivized workers. But are the educational and age differences a sufficient explanation for the differences in the number of children? As in the previous section, an OLS regression model is used to test the net effect of type of occupation on number of children. The model regresses the number of children on type of employment controlling for education, age, origin, area of residence and marital status. As can be seen in the first column of Table 4, the results are very similar to those obtained in the analysis of the Married Women Survey. Here again, only the collectivized type of occupation showed a statistically significant negative effect on the number of children relative to not working.

Collectivized workers generally started using modern family planning at a much lower parity than either individualized workers or non-working women (Table 3). These differences are tested with OLS regression while controlling for the same set of

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Table 4. Multivariate analyses of number of children, number of children at first contraception, months since last birth and injection use, Clinic Survey, Maputo, 1993

	Number of children (OLS regression)		Number of children at first contraception (OLS regression)		Months since last birth (OLS regression)		Current use of injection[a] (logistic regression)	
	β	SE	β	SE	β	SE	β	SE
Work environment								
Not working (ref.)								
Individualized	−0·073	0·069	−0·067	0·085	2·623	1·455	0·415*	0·201
Collectivized	−0·415**	0·066	−0·495**	0·081	5·209**	1·476	0·155	0·213
Age	0·204**	0·004	0·178**	0·005	2·52**	0·133	0·120**	0·018
Number of children	—		—		−2·881**	0·480	0·560**	0·063
Education	−0·185**	0·012	−0·270**	0·014	−0·068	0·263	−0·064	0·036
Place of birth								
Rural area or town (ref.)								
City	−0·016	0·050	−0·031	0·061	0·547	1·067	−0·174	0·148
Area of residence								
A central *bairro* (ref.)								
A peripheral *bairro*	−0·184	0·141	−0·371*	0·173	3·296	3·273	—	

Marital history							
Never married							
Ever married	—		0·111	0·080	—	—	
Marital status							
Has no husband/partner (ref.)							
Has husband/partner	0·373**	0·059	—		−8·453**	1·327	−0·067	0·207
Clinic of interview							
Maxaquene (ref.)							
Chamanculo	—		—		—		0·422	0·227
José Macamo	—		—		—		−0·837**	0·241
Premeiro de Maio	—		—		—		−0·057	0·244
Bagamoyo	—		—		—		−0·145	0·223
Constant	−1·927		−0·866		−25·125		—	
R^2	0·70		0·60		0·27		—	
−2 Log likelihood	—		—		—		1245	
Number of observations	1978		1965		1824		1832	

(ref.), reference category; [a]nulliparous women excluded; *$p<0·05$; **$p<0·01$; —, not used or not applicable.

variables as in the previous model, with the exception of co-residence with a marital partner, which is replaced with having ever been in a marital union (Table 4, second column). Again, collectivized workers are significantly distinct from non-workers, but individualized workers are not.

To test whether the type of work environment is associated with a longer birth interval the three groups of family planing users are compared with respect to time elapsed since the last birth. Indeed, among non-nulliparous respondents ($n = 1824$), collectivized workers had the largest average waiting period after the last birth (40·3 months), followed by individualized workers (31·7) and non-workers (26·0). However, in a multivariate OLS regression test where the number of months since the last birth was used as the response variable (Table 4, third column), only the collectivized environment demonstrated a statistically significant positive effect.

Collectivized workers had by far the highest share of those who had ever tried the IUD, arguably the most sophisticated of the three main contraceptive methods: 46·4% compared with 30·0% among individualized workers and 26·0% among non-workers (Table 3). The percentage of collectivized workers who had ever taken contraceptive pills was also noticeably higher than that of individualized workers but somewhat lower than that of non-working women (68·7% versus 60·6 and 69·7%, respectively). On the other hand, collectivized workers were less likely than individualized workers to use injectable contraceptives (29·4 versus 35·0%). In all, however, collectivized workers were more likely to experiment with different methods than women in the other two groups. Thus 7·6% of collectivized workers had tried all three main methods (the pill, the IUD and injection of Depo-Provera), compared with 2·4% of non-workers and 2·7% of individualized workers.

Oral contraception is by far the most popular current method of contraception, used by over half of the respondents in each occupational category. Its popularity may have been inflated by the official policy of discouraging the use of Depo-Provera among younger, lower-parity women. In contrast, and despite the Ministry of Health's vigorous promotion of the IUD, a minority of respondents in all three groups were using an *aparelho* (literally, device). Notably, the proportion of IUD users was again highest among collectivized workers.

The occupational groups are further tested for differences in their preference for a particular non-terminal contraceptive method: the pill, the IUD or Depo-Provera (other family planning methods are very seldom offered). It seems particularly interesting to find out whether the choice of the injection versus the pill or the IUD is correlated with work environment because the use of injectables can be seen as the least 'sophisticated' contraceptive option, both culturally and practically.

When modelling the likelihood of the use of Depo-Provera, nulliparous women are excluded from the analysis because such women are routinely denied Depo-Provera by family planning clinics out of fear of permanently impairing fertility. In this model, the individualized environment has a significant positive effect on the probability of using Depo-Provera relative to not working, but the collectivized environment does not (Table 4, fourth column). Although this fact does not directly attest to any advantage of the collectivized environment in providing access to culturally more complex contraceptive methods, it does indicate that the individualized working environment may reduce or discourage such access.

Focusing on the workplace

Table 5 presents a summary sociodemographic profile of the occupational groups in the Workplace Survey. These statistics allow an examination of the differences between the individualized and collectivized categories, as well as the differences within each of them. Both groups of collectivized workers – factory workers and ministry employees – were considerably older on average than individualized workers – cement and reed city market vendors. Considering the age differences, vendors' excess in the number of living children is potentially much larger. Low fertility of ministry employees is particularly notable and seems related to a combination of a high educational level, a low marriage/partnership rate and a relatively high contraceptive prevalence. Although factory workers had by far the largest share of contraceptive ever-users, the proportional differences between them and ministry employees in the rate of current use were much more modest, especially considering the fertility differences between them. The two groups of market vendors had rather similar rates of ever use and current use of contraceptives, both considerably below those of collectivized workers.

Collectivized workers had a higher share of those who knew at least one other current user of modern contraception. Notably, ministry employees, somewhat less experienced in family planning than factory workers, were nevertheless much more likely to know a user. Even though the interviewed women were not asked to name another user or users, it is likely that women in both categories understated what they really knew from rumours or accidental observations. In any case, however, the salient differences between the two environment categories remained.

Multivariate tests are again employed to ascertain the net effect of the type of workplace environment on fertility and contraception. Although the relatively small sample size does not allow an analysis of all the nuances in these associations, the results of these tests nonetheless offer a useful illustration of the difference between the individualized and collectivized categories of workers. These results are displayed in Table 6.

The association between workplace environment and number of children is tested using OLS regression. After controlling for age, education, place of birth (city of not), area of residence, marital status (had a permanent partner or not) and contraceptive experience (had ever used contraception), the collectivized environment of the factory and the ministry showed a strong negative effect on the number of children compared with the individualized marketplace environment (Table 6, first column).

For the tests of contraceptive use at any moment in life and of current contraceptive use, logistic regression is employed in a model that controls for age, number of children, education, place of birth, marital status and area of residence. Again, working in a collectivized milieu significantly increased the likelihood of both having ever used and currently using a western family planning method (Table 6, third and fourth columns).

Finally, a logistic regression model with the same control variables as the two models just discussed is applied to examine the relationship between the type of workplace environment and knowing other family planning users. Unlike the previous tests, however, this test did not detect any significant net impact of the work

Table 5. Selected sociodemographic characteristics by work environment, Workplace Survey, Maputo, 1993

Characteristic	Collectivized environment			Individualized environment			Total
	Factory ($n=80$)	Ministry ($n=26$)	Both ($n=106$)	Cement-city market ($n=74$)	Reed-city market ($n=35$)	Both ($n=109$)	($N=215$)
Mean age (SD)	34·6	32·6	34·1	29·8	28·6	29·4	31·7 (7·3)
Mean number of children (SD)	3·2	2·2	3·0	3·5	2·6	3·2	3·1 (2·1)
Mean level of education (SD)	4·8	7·8	5·5	3·6	3·8	3·7	4·6 (2·4)
Has a husband/permanent partner, %	78·8	61·5	74·5	87·8	77·1	84·4	82·3
Born in a city, %	65·0	50·0	61·3	48·6	59·5	56·0	58·6
Lives in a peripheral *bairro*, %	58·7	23·1	50·0	100·0	17·1	73·4	61·9
Ever used western contraception, %	68·8	50·0	64·2	33·8	37·1	34·9	49·3
Currently using western contraception, %[a]	50·0	45·8	49·0	18·8	17·1	18·3	33·3
Knows at least one user of family planning, %	45·0	76·9	52·8	28·4	34·3	30·3	41·4

SD, standard deviation; [a]non-pregnant women only ($n=204$).

Table 6. Multivariate analyses of number of children, contraceptive use and knowledge of other family planning users, Workplace Survey, Maputo, 1993

	Number of children (OLS regression)		Ever used contraception (OLS regression)		Currently uses contraception[a] (logistic regression)		Knows a fam. plan. user (logistic regression)	
Variable	β	SE	β	SE	β	SE	β	SE
Occupation								
Market vendor (ref.)								
Ministry or factory worker	−1·169**	0·267	1·820**	0·435	2·487**	0·519	−0·343	0·408
Age	0·187**	0·017	−0·081*	0·035	−0·086*	0·040	−0·005	0·034
Number of living children	—		0·601**	0·123	0·688**	0·145	0·103	0·109
Education	−0·093	0·054	0·048	0·084	0·047	0·100	0·244**	0·088
Place of birth								
Rural area or town (ref.)								
City	0·206	0·218	0·588	0·331	0·847*	0·382	0·811*	0·328
Area of residence								
A central *bairro* (ref.)								
A peripheral *bairro*	0·262	0·220	−0·018	0·342	0·391	0·387	−0·259	0·327
Marital status								
Has no husband/partner (ref.)								
Has husband/partner	0·286	0·274	−0·586	0·421	−0·170	0·459	–0·265	0·406
Experience with western contraception								
Never used (ref.)								
Used at least once	1·171**	0·217	—		—		0·731*	0·338
Constant	−4·125		—		—		—	
R^2	0·53		—		—		—	
–2 Log likelihood	—		242		197		252	
Number of observations	215		215		204		215	

(ref.) reference category; [a]pregnant women excluded: *$p<0·05$; **$p<0·01$; —, not used or not applicable.

environment (Table 6, fourth column). Despite the reservations expressed above about the reliability of the known-user variable, this result suggests that the effect of the workplace environment cannot necessarily be construed in terms of direct and intentional transmission of contraceptive information and experience. Fertility regulation is a very delicate matter for most women, and explicit discussion and exchange of their family planning experiences with people other than closest confidantes remain rare. However, as the observations of the three workplaces have suggested, the collectivized environment offers women a greater opportunity for interaction unrelated to work and indirect mutual influence on reproductive behaviour and tastes through both verbal dialogue and non-verbal communication on broad issues pertaining to family life, socializing and general sociocultural characteristics and preferences.

Still, even in the collectivized environment, women's interaction unrelated to work is very limited in time and nature. It usually takes place during lunch and other breaks, when most workers usually remain on the work premises, or immediately before and after work. The informal networks that women establish in the collectivized environment also tend to be exclusive. The circle of interaction is typically restricted to a small number of other women with whom the woman feels most comfortable to exchange opinions and experiences.

Not all collectivized environments are equally propitious for informal interactions. The unstructured interviews and field observations showed that ministry employees had more pauses from work during the workday and interacted more frequently on matters unrelated to work with other colleagues than did factory workers, whose working routine was more rigid, intense and continuous, and allowed for less spatial mobility on the factory floor.

The office environment, like that of the ministry, has another substantial advantage. It is more socially heterogeneous as it includes women of different educational backgrounds, occupations and statuses. Of course, direct interaction across status boundaries is rare, but indirect interaction, through overlapping circles of informal social networks, is common, and facilitates the spread and legitimation of innovative reproductive tastes and practices.

What about the market vendors? On the face of it, the spatially restricted and crowded marketplace seems as favourable to intensive interaction as any collectivized environment. However, closer inspection shows that the physical proximity of market vendors to one another does not translate into a type of interaction that can facilitate the circulation of reproductive information. Vendors' interaction, although quite intensive during and outside the time they spend at the market, is almost always business-related: co-ordinating prices, negotiating with suppliers, lending measuring and weighing equipment, or joining in some rotating credit associations. However, the competitive nature of their business tends to prevent any interaction beyond the minimal co-ordination and negotiation required for their individual survival. Their interaction with customers is even more narrowly focused and episodic. In addition, their work process does not provide for any formal interruption of predictable duration, such as the lunch break that typically occurs in collectivized environments. Thus, not surprisingly, market vendors interviewed for this study typically did not report having many conversations on non-business subjects with fellow vendors.

Obviously, the opportunities for such conversations are even more reduced in the case of the more spatially isolated – but almost as common – women's occupations, such as street selling and peddling.

Verbal exchanges are of major importance but are not the only form of women's interaction. As the interviews indicated, what women see (or do not see) may be equally important. For example, the pill is generally a more noticeable contraceptive than the injection. The pill needs to be taken every day, whereas the injection is applied only once every 3 months. A woman can take a pill in any circumstances, but she must go to a family planning clinic for an injection. A pill user may often carry the pill package with her (especially if she is afraid that her husband, opposed to family planning, will destroy it in her absence), and other women, including her co-workers, may notice the package. As generally less-educated marketplace sellers tend to use injections rather than the pill, their chances of inadvertently or purposely exposing their contraceptive practice are lower than those of collectivized workers, especially those at the ministry, among whom the opposite tendency prevails.

Conclusion and discussion

This study presents and tests a new conceptualization of the relationship between work outside the home and fertility. The analysis generally confirms the assumption about the differences between more individualized and more collectivized environments with regard to fertility and contraception. The collectivized environment is associated with lower fertility and higher contraceptive use than either the individualized work environment or not working outside the home.

In fact, a work environment where women remain socially isolated – such as the seemingly collectivized but essentially individualized marketplace setting – may even slow down the diffusion and internalization of innovations. Women who are continuously immersed in such an environment for a large part of the day simply do not have much time left to spend in other, more interaction-conducive settings. The results for contraceptive experience in the Married Women Survey illustrate this point. As this study suggests, the collectivized and individualized work environments may also differ in the type of contraceptives they promote: as the analyses of the Clinic and Workplace Studies indicate, individualized workers are more likely to use Depo-Provera, whereas collectivized workers tend to prefer the pill.

It should be emphasized, however, that survey data are generally not well suited to investigating directly the process of interaction and exchange of innovative knowledge and practices. More research – relying primarily on qualitative methods – is needed to examine what type of information is transmitted and through what channels. However, the results of this study do imply that the spread of new reproductive tastes and practices should be seen as part of the broader process of the diffusion of innovative information. In fact, the general life outlooks and styles that a particular work environment helps to cultivate may have greater influence on changes in reproductive behaviour than knowledge of specific fertility-related facts or acquaintance with a specific family planning user acquired in that environment. Thus indirect benefits of the interaction stimulated by the work milieu may be more important for reproductive change than direct ones.

Of course, women are exposed to multiple sources and channels of information directly or indirectly related to reproduction, and the work environment is only one such source. Further research on the impact of the work milieu on childbearing and contraception needs to explore the relative role of this impact. This importance of women's work environment relative to other factors that promote reproductive innovations may change with broader socioeconomic and cultural transformation of society. In today's Maputo, as in most sub-Saharan cities, women's economic activities outside the home are still often perceived as marginal to the household economic survival, and therefore women's employment and career opportunities remain uncertain and are easily forsaken. As socioeconomic changes spurred by the structural adjustment reforms exacerbate material hardships, weaken the traditional extended family support systems, and undermine the position of men as primary income providers, women's participation in the paid labour force will become increasingly central to the household well-being. Under these conditions, the financial cost of the workforce opportunities that women forgo because of childbearing may increase in importance.

Finally, this study offers a valuable lesson for family planning efforts in Maputo and similar settings. It has been previously demonstrated that dissemination of family planning information and distribution of contraceptives solely through formal channels cannot guarantee massive and successful adoption of family planning practices. Rather, informal peer networks of 'women like us' play a crucial role in the spread and legitimation of reproductive and contraceptive innovations (Bongaarts & Watkins, 1996; Rutenberg & Watkins, 1997). However, these networks differ in density and effectiveness in different social environments. The findings of this study suggest that women in individualized occupations – where most economically active urban women tend to concentrate – are greatly disadvantaged (at least compared with women who work in more collectivized milieus) with respect to the peer network-based process of internalizing and legitimizing the family planning message. As Mozambique further advances towards a free-market economy and the shift from supply-side to demand-side subsidies in the family planning system becomes imminent, this system must prioritize individualized workers among other disadvantaged categories of women in the allocation of its limited resources.

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