

FAMILY SIZE AND SEX PREFERENCES AND EVENTUAL FERTILITY IN BOTSWANA

EUGENE K. CAMPBELL* AND PUNI G. CAMPBELL†

**Department of Demography, University of Botswana, and* †*Ministry of Finance and Development Planning, Gaborone, Botswana*

Summary. Botswana is one of the sub-Saharan countries where actual fertility has declined. This study examines the fertility preferences of both men and women and shows that fertility intentions have a significant influence on future fertility behaviour. Fertility preferences are relatively low and there is no significant difference between those of men and women. Men's preference for sons influences desired family size and eventual fertility. For women as well as men, child survival is an important factor. Women's income is also influential.

Introduction

Studies on family size and sex preferences have relevance for fertility behaviour in a society. The indications are that there is consistency between fertility intentions and its eventual implementation (Westoff, Mishler & Kelly, 1957; Westoff, Potter & Sagi, 1963; Coombs & Freedman, 1979; Hermalin *et al.*, 1979; Nair & Chow, 1980; Tan & Tey, 1994) in developed countries and parts of south-east Asia. However, in developing countries there are serious doubts about the reliability of stated family size preferences in accurately predicting future fertility behaviour (WFS, 1981; Grebenik, 1989; Vlassoff, 1990). While Westoff previously believed in the predictive power of stated fertility intentions, his views now seem to be consistent with those who feel otherwise (Westoff, 1991). The transition from high to low fertility in sub-Saharan Africa is still being debated but the indications are that it is more a reality than a myth.

In Africa, traditional values associated with large families (and sons, where men are concerned) have contributed largely to failure in successful implementation of fertility intentions. Since the 1980s, however, the fertility preferences of men and women throughout sub-Saharan Africa have declined considerably. Factors responsible for this change include urbanisation, the enhancement of education, women's socioeconomic status and parental aspirations for their children. While contraceptive availability is among the factors responsible for fertility change, Pritchett (1994) makes the case for a relationship between fertility desires and fertility reduction. Perhaps the most powerful deterrent to preferences for large families, especially in West Africa, is the rapid economic decline since the late 1970s. There have been changes in fertility behaviour to smaller family sizes in Botswana, as well as in Zimbabwe and Tanzania

(Rutenberg & Diamond, 1993; Thomas & Muvandi, 1994a; Mturi & Hinde, 1994), and in Kenya (Dow *et al.*, 1994).

Botswana's total fertility rate dropped from 7.1 in 1981, through 6.5 in 1984 to 5.0 in 1988. Thomas & Muvandi (1994a, b) argue that Botswana's fertility decline is partly explained by differences in the samples of the Botswana Family Health Surveys I and II, 1984 and 1988; but Blanc & Rutstein (1994) do not agree.

The impact of changing attitudes towards marriage on fertility decline in Africa has also been acknowledged (Chojnacka, 1995). In addition, sex preference plays a part in some sub-Saharan Africa countries and there is a range from no significant preference in Sierra Leone through moderate preferences in Kenya to strong preferences among men in Sierra Leone (Cleland, Verrall & Vaessen, 1983; Campbell, 1991). There is convincing evidence that the desire for sons tends to delay effective implementation of fertility control in Asia, but the same has not been established throughout sub-Saharan Africa.

It is interesting that it took so long for demographers to accept that a fertility transition had occurred in Africa. With less criticism of fertility preferences in the 1980s, the current achieved fertility would have been anticipated then. Indeed there is controversy surrounding the ability of people's fertility intentions to predict their eventual fertility behaviour. A primary contributor is the debate over the attitude and behaviour relationship. The case against such a relationship was strongly put by Bain (1928) when he dismissed attitudinal responses as absolutely useless to scientists. But throughout the debate on this issue, there has been considerable support for the thesis that stated intentions are eventually manifest in people's behaviour (Schuman & Johnson, 1976; Sjoberg, 1982; Snyder, 1984). Sex preferences among offspring, especially in Asia where son preference is strong, also explain why fertility intentions may be inconsistent with fertility behaviour (Arnold, 1985; Vlassoff, 1990).

It is unrealistic to expect a perfect relationship between fertility intention and fertility behaviour; but it is unclear whether changes in fertility preference generate changes in fertility behaviour. The popular view is that eventually populations are capable of achieving their desired family sizes (Becker, 1991; Pritchett, 1994; Bankole, 1995). Given the socioeconomic and political transitions that several African countries are experiencing, it may be assumed that deviations from initial desired fertility are due to rationalisation effects, and therefore not coincidental.

In a study of men in a highly urbanised part of Sierra Leone rapid reduction in real income was thought to be a primary factor in future fertility decline (Campbell, 1993, 1994). This view is supported by Dow *et al.*'s (1994) explanation for Kenya's fertility decline. The position in Botswana is somewhat similar. Economic growth in the country was accompanied by inflation and, in the city, shortage of affordable housing. Between 1989 and 1995 real income increased initially and subsequently declined with economic recession. This, plus staff retrenchment in the private sector, has contributed to restrictive implementation of intergenerational wealth flows. Moreover, increased demand for consumable goods aided the process of rational decisions on choices within the limits of expendable income. The overall effect is a rise in the costs of marriage and reproduction in comparison with the 1980s. Migration also plays a part; since the 1970s, women have been dominant in rural urban migration, the primary destinations being the capital city—Gaborone—and diamond mining towns—Jwaneng and Orapa

(Gwebu, 1987; Campbell, 1995). Meanwhile considerable decline in the mean age of migrants to African cities have occurred (Oucho & Gould, 1993). Apart from the effect of labour migration of men to South African mines, it seems that much of Botswana's fertility change since the 1980s is due to modernising effects of residency in urban centres (Brown, 1983; Brockerhoff, 1995). Indeed, even when Botswana's fertility was high, the total fertility rate being 6.5 (Manyeneng *et al.*, 1985), fertility intentions were already setting the pace for rapid fertility decline.

The evidence on Botswana's fertility decline has so far been derived from the fertility experiences of women alone. However, men's fertility attitudes may differ from women's and this may have significant implications for changes in achieved fertility. This paper investigates (a) whether fertility attitudes in Botswana will eventually be manifest in the country's future fertility level, (b) how male intervention affects the change in fertility preferences, and (c) the effect of sex preferences and education on the direction of fertility change in Botswana.

Method

The data are primarily from a survey of men and women conducted between June and August 1992 in the east of Botswana (where over 80% of the population lives). The samples were taken from five localities: Gaborone (the capital city), Ramotswa in the South-east District, Kanye and Digawana in Ngwaketse District, and Serowe in the Central District. Digawana is the only truly rural locality and Gaborone the only town. The others are urban centres with some rural semblance. The five localities were chosen because they are typical of the eastern part of the country.

The sample size was determined from an assumed proportion (p) of contraceptive use among men and women in the study area, based on the 1988 figure of 30% for all women in Botswana using effective contraceptives (Lesetedi *et al.*, 1989).

Only citizens of Botswana were included and women had to be over 15 and men over 20 years of age. In Gaborone, the 78 enumeration areas (EA) in the 1991 census were renumbered continuously in a more or less serpentine manner. A sample of 10% of the EAs was selected with a random start. In each of the eight sample EAs in Gaborone, two eligible persons (one female and one male) were enumerated in 78 (i.e. 1250/16) sample households. The households, and thus the sample men and women, were selected systematically. With an average household size of 3.5 persons in Gaborone, it was estimated that the total number of households in Extension 2 (for example) was 453. Thus, one in six households was selected from a list of the census household numbers. The sample selection in other sample EAs was based on the same principle, with the sampling fraction determined by the population size of the EA. Considering the living arrangements of unmarried persons in Gaborone, households with no eligible woman or man were noted and selection of additional samples made using a new random start. Where more than one household existed in a plot of land, the additional man or woman required was selected from the next household (if the required sex was available). The selection procedure was similar in the other localities, except in Digawana where the census of eligible persons was taken because of the relatively small population.

A structured questionnaire was administered through the canvasser method. The

Table 1. Number and percentage of men and women by number of children desired

No. of children desired	Men		Women	
	<i>N</i>	%	<i>N</i>	%
0	10	1.0	12	1.0
1	66	6.3	255	21.5
2	242	23.1	227	19.1
3	192	18.3	172	14.5
4	277	26.5	128	10.8
5	74	7.1	117	9.9
6	98	9.4	92	7.8
7	14	1.3	75	6.3
8	18	1.7	59	5.0
9+	56	5.3	49	4.1
Total	1047	100.0	1186	100.0

Non-numerical cases excluded.

total enumerated population was 2501, of which 1390 were women and 1111 men. All variables were normalised using a logarithmic transformation. Stepwise multiple regression was used to select only those variables which contributed significantly to the variance. This method is useful when problems associated with multicollinearity exist (Draper & Smith, 1981; Neter, Wesserman & Kutner, 1985).

Findings

Correlation analysis showed that, in both sexes, there was a strong association between family size and number of surviving offspring (for males, $r=0.088$, $p<0.01$; for females, $r=0.185$, $p<0.001$).

Very few people in Botswana did not want to have a child (Table 1). This is consistent with findings in other African countries and is explained mainly by socioeconomic and cultural factor.

The modal desired family size is four children for men and one child for women. Though the situation for women seems strange in the African context, their fertility preferences actually lie between one and three children. Meanwhile a substantial number of men and women still maintain preferences for large families (more than five children).

The mean desired family size of women was 3.1 children in 1992, reflecting a decline of one child since 1988 when it was 4.7. Table 2 shows that though women desired on average more children than men, the difference is not significant ($p>0.05$). The preferred completed family size is the sum of the actual family size and additional children wanted. As with desired family size the difference between men and women's preferred completed family size (Table 2) is not significant. Women seem to have more surviving offspring than men but the difference is not significant.

Table 2. Mean desired family size, actual family size and expected completed family size, by sex (geometric means)

Sex	Family size								
	Desired			Actual			Preferred completed		
	Mean	SD	<i>N</i>	Mean	SD	<i>N</i>	Mean	SD	<i>N</i>
Men	3.11	2.63	1047	2.52	3.13	813	3.88	3.23	1110
Women	3.14	2.73	1302	2.69	2.92	1186	3.53	2.43	1386
Total	3.13	2.69	2349	2.62	3.01	1999	3.67	2.77	2496
<i>F</i>		0.05			1.70			1.80	
<i>p</i>		0.83			0.19			0.18	

Differences in *N* due to exclusion of non-numerical and non-response cases. SD=Standard deviation.

Though previous studies indicated higher family size preferences for men than women, the Botswana case is not now exceptional. The economic cost of rearing children is as high for women in Botswana as it is for men. Women in this society actually bear most of the social and psychological costs of child-rearing due to the increasing incidence of extramarital motherhood (Schapera & Comaroff, 1991; Dow & Kidd, 1994).

Table 3 may suggest that men's responses about their fertility behaviour are understated especially for men aged 35–49 years. This is likely if a significantly higher proportion of married women than men were included in the sample, but this is not the case. Indeed, a large proportion of the men and women (60.1%) had never been married. Given that there are significant differences among some of the age/sex fertility levels in Table 3, why is the overall actual difference not significant? A logical explanation is that variations in responses of men are higher than those of women; and the standard deviations corresponding to actual family size support this view.

Correlates of desired family size

The relationship between desired family size and selected factors is examined by analysis of variance. Table 4 indicates that, in Botswana, women are influenced much more than men by social and economic interventions. An exception is the character of birthplace. Birthplace was measured as the duration of residence in region of birth and it is preferable to current residence because of the length of time spent in the region of birth: an average of 28.7 years for those born in rural areas and 36.1 years for those born in urban centres. Thus the sample population's exposure to the sociocultural milieu of their birthplace was sufficient for them to cultivate fertility attitudes which are normative in these regions. For both sexes, being born in an urban centre yields fertility intentions significantly lower than when the birthplace is rural. For men and women, $F = 35.788$ and 12.159 , respectively, both significant at $p < 0.001$.

Table 3. Mean number of children ever born and children surviving, by age and sex of respondent*

Age (years)	Children ever born		Children surviving		SD	
	Men	Women	Men	Women	Men	Women
15-19		1.875		1.386		1.27
20-24	1.274	1.337	1.073	1.220	3.07	2.29
25-29	1.633	1.939	1.316	1.778	3.70	2.08
30-34	2.245	3.080	2.007	2.511	2.88	3.55
35-39	3.085	4.155	2.881	3.912	1.83	1.69
40-44	3.819	5.021	3.553	4.543	1.89	1.68
45-49	4.824	5.499	3.825	4.208	3.40	3.26
50+	5.765	6.222	4.316	4.451	2.71	2.88
Total	3.035	3.210	2.519	2.686	3.13	2.92
<i>N</i>	1106	1384	1106	1384		

*Geometric means.

Table 4. Mean desired family size (DFS) by selected socioeconomic indices and sex*

Socioeconomic factor	Men			Women		
	DFS	<i>N</i>	<i>p</i>	DFS	<i>N</i>	<i>p</i>
Age (years)			NS			0.05
15-19	—	—		2.775	127	
20-29	2.876	451		3.089	476	
30-39	3.509	297		3.427	330	
40-49	3.461	131		2.848	177	
50+	2.977	232		3.284	275	
Birthplace			0.001			0.001
Rural	3.443	836		3.315	1048	
Urban	2.298	272		2.635	333	
Education			NS			0.001
None	3.335	346		3.374	331	
Primary	3.301	410		3.416	591	
Jr Secondary	2.783	149		3.035	273	
Sr Secondary	2.825	98		2.820	93	
Post Secondary	2.619	108		1.927	99	
Marital status			NS			0.001
Never married	3.021	679		2.988	811	
Married	3.411	336		3.693	431	
Separated/divorced	3.050	20		2.330	32	
Widowed	2.475	64		2.608	108	

Table 4. (continued)

Socioeconomic factor	Men			Women		
	DFS	<i>N</i>	<i>p</i>	DFS	<i>N</i>	<i>p</i>
Income (Pula)			NS			0-001
None	3-877	616		3-359	961	
200-399	3-237	120		3-541	114	
400-649	3-540	93		2-632	78	
750-1499	3-177	134		2-627	122	
1500+	2-736	146		2-183	109	
Occupation			0-05			0-01
Not employed	3-102	616		3-361	961	
Prof./technical	2-865	109		2-519	129	
Admin-/managerial	2-446	37		2-234	30	
Clerical	2-414	48		2-337	77	
Sales	3-754	89		2-888	58	
Services	3-627	170		3-210	112	
Farm/cattle/hunt	3-438	5		4-805	6	
Transport/commun.	2-295	30		3-097	12	
Other	2-737	7		4-243	2	
Value of children			NS			0-001
Very important	3-063	789		3-150	907	
Important	3-253	307		3-264	447	
Not important	3-003	12		1-524	26	
Value of own children			0-05			0-01
Very useful	2-974	727		3-113	818	
Useful	3-387	360		3-279	536	
Not useful	3-179	20		1-620	25	
Expect financial support from children			NS			0-05
None	2-927	181		2-611	169	
Some	3-138	626		3-196	824	
Much	3-055	253		3-310	331	

*Geometric means.

For females educational level, marital status and income also have significant influences on desired family size ($p < 0.001$) when the effects of other factors are excluded. But notwithstanding the differences in men's fertility intentions, they are not significantly influenced by education, income and marital status.

The desired family size of women is significantly influenced by the value they place on children but this is hardly the case with men. There is no indication that women in Botswana value children more than men do but Table 4 suggests that women are more likely than men to experience changes in their desired family size with changes in benefits derived from their children.

Table 5. Summary statistics from multiple regression, with response variable being desired family size

Predictor	B	SE B	<i>p</i>	R ²	Adjusted R ²
Men					
Proportion of sons desired	-0.340	0.065	0.000	0.130	0.100
Preferred completed family size	0.254	0.054	0.000	0.152	0.145
Proportion of daughters desired	-0.170	0.049	0.001	0.190	0.180
Proportion of children surviving	-0.150	0.058	0.010	0.211	0.199
Women					
Preferred completed family size	0.299	0.032	0.000	0.124	0.121
Proportion of children surviving	-0.255	0.019	0.000	0.249	0.245
Number of children ever born	-0.176	0.134	0.000	0.290	0.245
No. of children men should have	0.177	0.039	0.000	0.329	0.321
Age of respondent	0.214	0.076	0.006	0.342	0.333
Proportion of daughters desired	-0.154	0.074	0.037	0.351	0.339

Multiple regression analysis

Multiple regression analysis is used to identify variables with a significant influence on the desired and preferred completed family sizes. Initially the variables included as predictors of desired family size were the respondent's age, father's education, mother's education, occupation, monthly income, proportion of sons desired, proportion of daughters desired, number of children ever born, proportion of children surviving, preferred completed family size, duration of stay in birthplace, spouse's age, spouse's occupation, number of children a man should have and number of children a woman should have. In addition an interaction term was generated from education and income because respondent's education had no significant effect on the desired family size, thus recognising education as a proxy for income. The respondent's parent's education is included because, in transitional societies, this factor tends to have a greater influence on respondents' attitudinal changes than the education of the respondent (Campbell, 1993).

Table 5 shows that four of the sixteen initial predictors had significant effects on the formation of men's fertility intentions. Together they explain 21.1% (R²) of the variance in the desired family size. For women seven significant predictors accounted for 35.1% of the variance in their desired family size. Among the determinants of the number of children desired by men and women is a preference for sex of offspring. For men, the preference for sons explains 10.3% of the variance in the response variable. The negative regression coefficient (-0.340) is consistent with conditions under declining fertility preferences. It indicates an increase in men's desire for sons in the decade preceding 1992, when their fertility preferences declined.

The negative regression coefficient (-0.170) reflects a strengthening also of men's preference for daughters due to the decline in their fertility intentions. Daughter preference explains 3.8% of the variance in desired family size ($p < 0.001$). Botswana's remarkable decline in infant and child mortality since 1971 (Botswana, 1991) must have

contributed significantly to the decline in men's fertility preference ($b = -0.150$, $p < 0.01$).

An indication of actual fertility decline in Botswana is the contribution of the preferred completed family size to variations in men and women's desired fertility, accounting for 4.9% and 12.4% of the variance respectively; in both cases the significance level is above 0.001. The reduction in women's desired family size appears to have responded to improvement in child survival much more than is the case with men. This may be due to women's biological restrictions on fertility relative to men. Sex preference among offspring also contributes significantly to variations in women's desired family size. The negative regression coefficient (-0.154) indicates that the preference for daughters is premised on the declining fertility attitude.

Future fertility prospects

In predicting future fertility behaviour of a population, preferred completed family size was used. It is assumed that after experiencing the costs of caring for the first child, parents re-assess their fertility goals. In effect, the analysis excludes those who never had a child.

Two regression models were generated in order to obtain a better understanding of the determinants of future fertility behaviour in Botswana. For Model 1, the initial variables included are as in the analysis of desired family size, only this time preferred completed family size is the response while desired family size is one of the predictors. For Model 2, the effect of sex preference on desired family size is considered with the following variables added: number of sons desired if completed family is three children, number of daughters desired if completed family is three children, number of sons desired if completed family is five children, number of daughters desired if completed family is five children, proportion of sons ever born, and proportion of daughters ever born.

Model 1 in Table 6 reveals that, for men, five predictors explain 71.7% of the variance in the preferred completed family size. For women, the corresponding contribution of four predictors is 78.5%. For both sexes, desired family size constitutes a significant determinant of eventual fertility. This is consistent with the arguments in favour of fertility intentions being a predictor of eventual completed fertility. Given the expected relationship between preferred and actual family sizes, the observation that the proportion of surviving children contributes significantly to variations in the response variable is plausible ($R^2 = 30.4\%$ for men and 29.1% for women).

Among men there is significant preference for sons in their completed family size. But the positive regression coefficient (0.100) is relevant to policy formulation. There were more sons than daughters among surviving offspring in small to medium size families (results not shown). This implies that strong son preference among men who desire large families may tend to delay the rate of fertility decline. It is symbolic that income, as a determinant of preferred completed family size, is significant among women. Since income serves as a proxy for education (Ben-Porath, 1973), it is assumed that education of women in Botswana influences their fertility achievement.

The importance of son preference to men is also seen in Model 2 (Table 6). Generally, Models 1 and 2 are similar. An exception is the observation that educational attainment of respondents' fathers contributes significantly to variations in men's

Table 6. Summary statistics from multiple regression, with response variable being preferred completed family size

Predictor	B	SE B	<i>p</i>	R ²	Adjusted R ²
Model 1					
Men					
Proportion of children surviving	0.925	0.041	0.000	0.304	0.301
No. of children ever born	0.846	0.048	0.000	0.697	0.695
Desired family size	0.125	0.043	0.004	0.706	0.703
Respondent's occupation	0.021	0.009	0.022	0.712	0.708
Proportion of sons desired	0.100	0.050	0.047	0.717	0.711
Women					
Proportion of children surviving	0.832	0.027	0.000	0.291	0.289
No. of children ever born	0.704	0.032	0.000	0.714	0.713
Desired family size	0.684	0.069	0.000	0.781	0.779
Monthly income	-0.009	0.003	0.013	0.785	0.782
Model 2					
Men					
Proportion of sons desired	0.905	0.181	0.000	0.275	0.266
Respondent's father's education	-0.037	0.018	0.041	0.349	0.331
Proportion of children surviving	0.991	0.308	0.002	0.387	0.362
No. of children ever born	0.491	0.158	0.003	0.445	0.415
Desired family size	-0.163	0.080	0.045	0.476	0.439
Women					
No. of children ever born	0.532	0.096	0.000	0.198	0.190
Proportion of children surviving	0.522	0.129	0.000	0.325	0.312
Desired family size	0.471	0.126	0.000	0.415	0.396
Monthly income	-0.017	0.008	0.035	0.441	0.418

preferred completed family size. The effect of parental educational level is noteworthy. Several studies on developing societies have failed to show statistically the link between respondents' education and their sociodemographic status. This may partly be explained by the fact that most of the persons studied were of the first generation educated at post-secondary level. The expected effects of formal education are therefore not easily manifest. But the inclusion of the respondent's parent's education introduces depth in the study because of the multi-generational effect. Interactions between parent and child contribute substantially towards intellectual development of the child. A child whose parents are highly educated would be intellectually advantaged compared to one with uneducated parents. Thus the formation of decisions based on fertility attitudes will be more revolutionary among children of educated parents.

Determinants of sex preference

Given the existence of strong son preferences in Botswana, it is expedient to investigate its determinants for men as well as women. The inclusion of women is based on their relationship with men. Fertility used to occur within marriage and the birth

Table 7. Summary statistics from multiple regression, with response variables being proportion of sons desired and number of sons desired if completed family size is three children

Response variable and predictor	B	SE B	<i>p</i>	R ²	Adjusted R ²
Proportion of sons desired					
Men					
Desired family size	-0.274	0.052	0.000	0.103	0.100
Proportion of daughters ever born	-0.028	0.014	0.044	0.118	0.111
Women					
Proportion of daughters desired	-0.039	0.128	0.000	0.160	0.158
No. of sons preferred if completed family is three children					
Men					
No. of daughters desired	-0.136	0.023	0.000	0.114	0.110
Interaction education × income	-0.002	0.001	0.004	0.142	0.135
Women					
Proportion of sons desired	0.446	0.044	0.000	0.171	0.169
No. of daughters desired	-0.207	0.031	0.000	0.271	0.266
Preferred completed family size	-0.283	0.103	0.006	0.341	0.335
Proportion of daughters preferred	-0.244	0.083	0.004	0.356	0.349
Age of spouse	-0.275	0.133	0.040	0.364	0.355

of a son helped to stabilise the union. It is likely therefore that women have cultivated an underlying preference for sons, even though it is not apparent.

The measurement variables used as the son preference responses are: (1) proportion of sons desired and (2) number of sons preferred if a person's completed family size was three children. Table 7 shows that the desired family size of men does have a strong negative relationship with their preferences for sons. This strengthens the observation that preference for sons among men in Botswana has increased significantly with the reduction in their fertility intentions and is a natural condition where son preference exists in a society that is experiencing rapid transition from high to low fertility. The proportion of daughters also has a significant effect on the variance in men's preference for sons ($R^2 = 1.5\%$). The corresponding negative regression coefficient (-0.028) indicates an enhancement of men's desire for sons after fathering one or two daughters but no son. For the response variable number of sons preferred in a completed family size of three, interaction of education and income influences men's son preference significantly ($p < 0.01$). Following Becker's (1991) theory on fertility change, it is likely that, given the negative sign of the regression coefficient, improvement to men's education (and thus income) will assist the fertility reduction process. But at the same time, it raises the desire for at least one son among the offspring.

The underlying son preference among Botswana women is manifest in Table 7. The regression coefficient (-1.039) reflects strong underlying preferences for sons where the desire for daughters is quite low. In completed family size of three children the underlying preference for sons among women is once more apparent. This is

particularly demonstrated by the positive sign in the first predictor as well as the negative signs in the other four predictors. With respect to the spouse's age being a significant factor in women's preference for sons, the explanation could partly be found in the perceived difficulties women reportedly experience in retaining a male partner. Women's frequent complaint about the scarcity of eligible men in Botswana is partly due to the low sex ratio of the adult population. Thus the negative sign of the regression coefficient is suggestive of a woman's wish to retain a youthful husband (or partner). This wish might be realised if she could bear him a son. In effect, women's preference for sons is associated with the sex preference of men in general.

Discussion and conclusion

This study provides results on fertility preferences which support existing evidence of a fertility decline in Botswana. Women's desired family size fell from an average of 5.9 in 1984, to 4.7 in 1988 and to 3.1 in 1992. The observation that women's fertility intentions are similar to those of their male counterparts is consistent with the findings of Lesetedi *et al.* (1989) in Botswana and Bankole (1995) in Nigeria. There are indications that the fertility intentions of men and women in Botswana will be manifest in their eventual fertility behaviour. Though the preferred completed family size for both sexes suggests that the future achieved fertility will be four children (not three), an additional child over the desired family size is unlikely. The peak desired family size is two to three children for men and one to two children for women. Given that the peak desired family size for most sub-Saharan countries is about four children, Botswana's current fertility attitude is moving further away from the African model.

Since high fertility in several developing countries was associated with strong son preferences, the marked fall in Botswana's fertility between 1971 and 1988 may be due to moderation of the son preference. In the event that this has occurred, education could be an influential factor. Table 7 reveals a significant contribution of the education/income interaction term to preferences for sons. The negative sign of the regression coefficient indicates that a significant fall in completed fertility would require substantial moderation of the preferences for sons; which has come about through increasing the educational status of the population beyond the primary school level. The government of Botswana has made vigorous progress towards educational enhancement. Between 1979 and 1984, enrolment into Forms 1 and 4 in secondary schools increased by 98.5% and 68.1%, respectively. This pattern continued up to and beyond 1989 (Botswana, 1985, 1991).

Women's preferences for sons relative to daughters have changed a great deal due to the empowerment of women in the modern economic sector and the use of effective contraceptive practices, resulting in a significant decline in fertility (Letamo, 1996). Increasing numbers of women are gaining secondary and post-secondary education (Botswana, 1991) and considerably more female rural-urban migration has occurred than for men since the 1970s (Gwebu, 1987; Campbell, 1995). In view of the modernising effects of urban residency (Brown, 1983; Brockerhoff, 1995) and female employment it is unlikely that men in contemporary Botswana will be able to fulfil their own preferences for sons.

The reduction in infant mortality and later age at marriage are also contributory factors in the decline in fertility.

In conclusion, it is expected that fertility decline in Botswana will persist until the

average family size is about three children. Though son preference will continue to exist among men, it is not likely to stop the process of fertility decline.

References

- ADEGBOYEGA, O. (1992) *The Structure and Dynamics of Family Formation in Africa*, pp. 46–60. UAPS, Dakar.
- ARNOLD, F. (1985) Measuring the effect of sex preference on fertility: the case of Korea. *Demography*, **22**, 280–288.
- BAIN, R. (1928) An attitude on attitude research. *Am. J. Sociol.* **33**, 940–957.
- BANKOLE, A. (1995) Desired fertility and fertility behaviour among the Yoruba of Nigeria: a study of couple preferences and subsequent fertility. *Popul. Stud.* **49**, 317–328.
- BECKER, G. S. (1991) *A Treatise on the Family*. Harvard University Press, Cambridge, Massachusetts.
- BEN-PORATH, Y. (1973) Economic analysis of fertility in Israel: point and counterpoint. *J. polit. Econ.* **18** (Suppl. 2), S202–233.
- BLAKE, J. (1981) Family size and quality of children. *Demography*, **18**, 421–442.
- BLANC, A. K. & RUTSTEIN, S. O. (1994) The demographic transition of southern Africa: yet another look at the evidence from Botswana and Zimbabwe. *Demography*, **31**, 209–215.
- BOTSWANA (1985) *National Development Plan 1985–91*. Government Printer, Gaborone.
- BOTSWANA (1991) *National Development Plan 7, 1991–1997*, Vols 1 and 2. Government Printer, Gaborone.
- BROCKERHOFF, M. (1995) Fertility and family planning in African cities: the impact of female migration. *J. biosoc. Sci.* **27**, 347–358.
- BROWN, B. (1983) The impact of male labour migration on women in Botswana. *Afr. Affairs*, 367–388.
- CALDWELL, J. C. (1982) *Theory of Fertility Decline*. Academic Press, London.
- CAMPBELL, E. K. (1991) Sex preferences for offspring among men in the western area of Sierra Leone. *J. biosoc. Sci.* **23**, 337–342.
- CAMPBELL, E. K. (1993) Family size preferences of men in the western area of Sierra Leone: methods and determinants. *Genus*, **49**, 181–199.
- CAMPBELL, E. K. (1994) Fertility, family size preferences and future fertility prospects of men in the western area of Sierra Leone. *J. biosoc. Sci.* **26**, 273–277.
- CAMPBELL, E. K. (1995) Population distribution and urbanization. In: *1991 Population and Housing Dissemination Seminar*, pp. 63–79. Central Statistics Office, Gaborone.
- CHOJNACKA, H. (1995) The role of nuptiality in the demographic transition. The case of Africa: a conceptual essay. *Genus*, **51**, 117–150.
- CLELAND, J., VERRALL, J. & VAESSEN, M. (1983) *Preferences for the Sex of Children and their Influence on Reproductive Behaviour*. WFS Comparative Studies No. 27. ISI, Voorburg.
- COOMBS, L. C. & FREEDMAN, R. (1979) Some roots of preference roles, activities and familial values. *Demography*, **16**, 359–375.
- DOW, T. E., ARCHER, L., KHASIANI, S. & KEKOVOLE, J. (1994) Wealth flow and fertility decline in rural Kenya, 1981–92. *Popul. Dev. Rev.* **20**, 343–364.
- DOW, U. & KIDD, P. (1994) *Women, Marriage and Inheritance (Women and Law in Southern Africa)*. Printing and Publishing Company Botswana, Gaborone.
- DRAPER, N. R. & SMITH, H. (1981) *Applied Research Analysis*. Wiley, New York.
- GREBENIK, E. (1989) Demography, democracy and demonology. *Popul. Dev. Rev.* **15**, 1–22.
- GWEBU, T. D. (1987) Internal migration and regional development in Botswana. In: *Internal Migration and Regional Development in Africa*, pp. 169–204. RIPS Monograph Series No. 2. Regional Institute for Population Studies, Accra.

- HERMALIN, A. I., FREEDMAN, R., SUN, T. H. & CHANG, M. C. (1979) Do intentions predict fertility? The experience in Taiwan, 1967–74. *Stud. Fam. Plann.* **10**, 75–95.
- LESETEDEI, L. T., MOMPATI, G. D., LESETEDEI, G., KHULUMANI, P. & RUTENBERG, N. (1989) *Botswana Family Health Survey II, 1988*. Institute for Resource Development/Macro Systems, Maryland.
- LETAMO, G. (1996) Contributions of the proximate determinants of fertility change in Botswana. *J. biosoc. Sci.* **28**, 325–338.
- MANYENENG, W. G., KHULUMANI, P., LARSON, M. K. & WAY, A. A. (1985) *Botswana Family Health Survey, 1984*. Westinghouse Public Applied Systems, Maryland.
- MTURI, A. J. & HINDE, P. R. A. (1994) Fertility decline in Tanzania. *J. biosoc. Sci.* **26**, 529–538.
- NAIR, N. K. & CHOW, L. P. (1980) Fertility intentions and behaviour: some findings from Taiwan. *Stud. Fam. Plann.* **11**, 255–263.
- NETER, J., WESSERMAN, W. & KUTNER, M. N. (1985) *Applied Linear Statistical Models*. Irwin, Illinois.
- OUCO, J. O. & GOULD, W. T. S. (1993) Internal migration, urbanization and population distribution. In: *Demographic Change in Sub-Saharan Africa*, pp. 256–296. National Academy Press, Washington, DC.
- PRITCHETT, L. H. (1994) Desired fertility and the impact of population policies. *Popul. Dev. Rev.* **20**, 1–55.
- RUTENBERG, N. & DIAMOND, I. (1993) Fertility in Botswana: recent decline and future prospects. *Demography*, **30**, 143–159.
- SCHAPERA, I. S. & COMAROFF, J. L. (1991) *The Tswana*. Kegan Paul, London.
- SCHUMAN, N. & JOHNSON, M. P. (1976) Attitudes and behaviour. *Ann. Rev. Sociol.* **2**, 161–207.
- SJOBERG, L. (1982) Attitude-behaviour correlation. Social desirability and perceived diagnostic value. *Br. J. social Psychol.* **21**, 283–292.
- SNYDER, M. (1984) When beliefs create reality. *Adv. exp. social Psychol.* **18**, 247–305.
- TAN, P. C. & TEY, N. P. (1994) Do fertility intentions predict subsequent behaviour? Evidence from Peninsular Malaysia. *Stud. Fam. Plann.* **25**, 222–231.
- THOMAS, D. & MUVANDI, I. (1994a) The demographic transition in southern Africa: another look at the evidence from Botswana and Zimbabwe. *Demography*, **31**, 185–207.
- THOMAS, D. & MUVANDI, I. (1994b) The demographic transition in southern Africa: reviewing the evidence from Botswana and Zimbabwe. *Demography*, **31**, 217–227.
- VLASSOFF, C. (1990) Fertility intentions and subsequent behaviour: a longitudinal study in rural India. *Stud. Fam. Plann.* **21**, 216–225.
- WESTOFF, C. F. (1991) *Reproductive Preferences: A Comparative View*. DHS Comparative Studies No. 3. Macro Systems, Maryland.
- WESTOFF, C. F., MISHLER, E. G. & KELLY, E. L. (1957) Preferences in size of family and eventual fertility twenty years after. *Am. J. Sociol.* **62**, 491–497.
- WESTOFF, C. F., POTTER, R. G. & SAGI, P. C. (1963) *The Third Child: A Study in the Prediction of Fertility*. Princeton University Press, Princeton, New Jersey.
- WFS (1981) *World Fertility Survey Conference, 1980*, Vol. 2. ISI, Voorburg.