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REPRODUCTIVE PREFERENCES AND CONTRACEPTIVE USE: A COMPARISON OF MONOGAMOUS AND POLYGAMOUS COUPLES IN NORTHERN MALAWI

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Summary. There is now widespread agreement on the importance of men's role in reproductive decision-making. Several studies have argued that fertility preferences and their translation into behaviour differ between polygamous and monogamous unions. Studies investigating the dominance of men's preferences over women's preferences, in cases of couple disagreement, found mixed evidence of the effect of polygamy. However, an often cited limitation of these studies has been the inability to link husband's intention with each of his wives in a polygamous union. By adding fertility-intention questions to an on-going Demographic Surveillance Site in Karonga District in northern Malawi the fertility preferences and contraceptive use of husbands and wives were investigated. An analysis of the relationship between the level of agreement and disagreement between husbands' and wives' fertility preferences was then performed to gain insight into the reproductive decision-making process of polygamous couples.

Introduction

The focus of this paper lies at the intersection of three strands of investigation, each of which has generated a substantial literature. The first strand concerns the relationship between preferences for future childbearing and reproductive behaviour and the closely related topic of unmet need for contraception. At the individual level, it has been shown that preferences change over time and are only moderately predictive of behaviour (Bankole & Westoff, 1998). At the aggregate level, the predictive power of preferences is greater; reduction of unmet need has been the main driver of fertility declines in developing countries over recent decades (Feyisitan & Casterline, 2000).

The second strand comprises the relative influence of husbands and wives on reproductive decisions and behaviour. The collection, largely through the Demographic and Health Surveys, of matched couple data has encouraged a range of analyses (Ezeh,

1993; Bankole, 1995; Speizer, 1995; Dadoo, 1998; Bankole & Singh, 1998). While the policy debate on this subject often implies that men's wishes dominate, a major review reached a more nuanced conclusion, complicated by the fact that spousal reports of contraceptive use are often inconsistent, stemming in part from clandestine use by wives (Becker, 1996; Biddlecom & Fapohunda, 1998; Blanc, 2001). Perception of the partners' wishes are likely to be as important as partners' actual preferences and some studies suggest that, in the absence of discussion, perceived disagreement about future childbearing may be greater than actual disagreement (Wolff *et al.*, 2000).

The third strand relates to possible differences in gender-power and decision-making between polygamous and monogamous unions. The topic is of considerable importance in sub-Saharan Africa because polygamy remains common: 30–50% of married women in West Africa, 20–30% in East Africa but less than 20% in southern Africa have one or more co-wives. Again, a body of literature has accumulated but evidence is inconclusive, partly because it has to be assumed implausibly that a husband's preference applies equally to all co-wives (Mott & Mott, 1985; Anderton & Emigh, 1989; Garenne & van de Walle, 1989; Dadoo, 1998; Bankole & Singh 1998; Agadjanian & Ezeh, 2000). Further complications arise from the fact that polygamy is a fluid state and that a distinction may be needed between first and subsequent wives (Ezeh, 1997; Timæus & Reynar, 1998; DeRose, 2007). Women willing to form polygamous marriages usually differ from other women in having less education, a greater probability of previous marriages and a wider spousal age gap (Pison, 1986). They may also differ in ways that cannot be easily measured in surveys.

This study seeks to advance knowledge at the intersection of these three strands. Its signal contribution lies in the availability of wife-specific fertility preferences obtained from polygamous men. To the authors' knowledge, no published studies have used such information.

Conceptual framework and research questions

Figure 1 provides a graphical illustration of the framework used in this exploratory analysis. A range of socioeconomic and demographic factors, including marriage type, influence the desire to have another child. Depending in part on spousal communication, partners will agree or disagree. Agreement may be perceived or actual and agreement, or otherwise, will influence the translation of desires into contraceptive use.

Drawing on this framework, the study aims to provide an insight into the reproductive decision-making process of polygamous couples compared with monogamous couples. Specifically, answers were sought to the following five questions. (1) Do men's and women's fertility preferences differ between those in polygamous and monogamous unions? (2) Is the level of disagreement between husband and wife higher in a polygamous relationship than in a monogamous one and is correct spousal perception of partner's preference lower in polygamous union than in a monogamous union? (3) Is use of contraception lower in a polygamous than in monogamous unions and, if so, can this be attributed to greater spousal disagreement about future reproduction among the polygamous? (4) Is consistency in reporting of contraception use lower in polygamous couples and are polygamous wives more prone to clandestine use? (5) Does the wife's or the husband's preference exert a more important influence on subsequent contraceptive

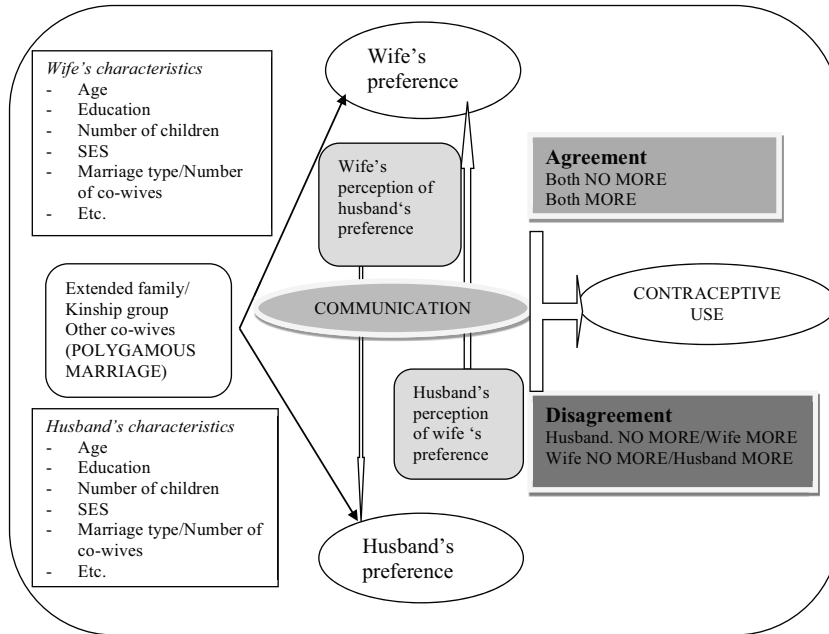


Fig. 1. Conceptual framework.

decisions or is it their joint preference that matters, and are these relationships similar in monogamous and polygamous couples?

Context

According to the latest Malawi Demographic Health Survey (MDHS) conducted in 2010 the total fertility rate is 5.70 births per woman (National Statistical Office [Malawi] & Macro, 2010). High fertility is accompanied by moderate use of contraception and high level of unmet need. In the 2004 MDHS only 28% of women reported using a modern method of contraception but this rose sharply to 42% in 2010. Despite this rise, one birth in every four was reported to be unwanted in 2010. Between 2000 and 2010 the reported ideal family size decreased from 5 to 4 children per woman, and at the time of the 2010 survey 37% of women said that they wanted no more children. Marriage is almost universal and women tend to marry relatively early and have a high incidence of divorce.

In this analysis, data from a Demographic Surveillance Site (DSS) in the south of Karonga District, northern Malawi, were used. The DSS population numbered 33,113 individuals on 1st January 2007, in an area of 135 km². The main economic activities around the DSS area, as in the rest of Karonga District, are farming, fishing and small business enterprises. Compared with other regions of Malawi, the northern region is the most rural but records the highest education and literacy indicators (Zulu, 1996). Christianity is the main religion, with only around 1% Muslim. The population is rural, mainly Tumbuka speaking, but the presence of other groups is not uncommon.

Farming is the main source of income for 43% of households, with 62% of households growing cassava and/or maize as their two main crops. Only 2% of households do not grow any crops. Seventeen per cent of households receive their main source of income from salaried employment or receive an income from letting of a property, 11% from trading, 9% from gathering of natural products, 7% from fishing, 5% from selling snacks or their own manufactured goods and 8% from providing a service or external support. Sixteen per cent of households have access to piped water, either to their house or to a communal tap, while 60% obtain their drinking water from a bore hole, and 24% from Lake Malawi, a river or a well. Only 3% of households are connected to electricity (authors blinded for review, forthcoming).

The average household size is around five members per household and the total fertility rate was around of 5.7 children per woman in 2005–2007. Analyses show different levels of fertility by women's education, household socioeconomic status and distance to road (authors blinded for review, forthcoming). The median age at first marriage is 18; the onset of childbearing is relatively early and universal with 90% of all 20- to 24-year-old women and 95% of currently married women having had at least one child (authors blinded for review, forthcoming). According to a recent assessment, HIV/AIDS remains the major cause of death among 15- to 59-year-olds (around two-thirds of deaths pre-ART) (Floyd *et al.*, 2010); HIV prevalence in adults was estimated at 2% in the late 1980s and 13% in the late 1990s. It has been fairly stable since 2000 and is now thought to be of the order of 10% among adults (Crampin, 2003).

According to ethnographical studies in northern Malawi (Petzer, 1987), the community is patrilineal and residence after marriage is usually patrilocal. This study notes that the young generation of newly married couples is increasingly likely to live with neither the husband's nor wife's relatives. Polygamy is a rooted social institution in this part of Malawi; it is widespread with 15% of men and 27% of women in a polygamous relationship (Marston *et al.*, 2009). The majority of polygamous couples live either in the same house or in the same compound (95%), compared with 99% of monogamous couples.

As pointed out by Ezeh (1997), polygamy is a fluid state; a woman might at some point in her lifetime experience a spell of polygamy due to her husband marrying another wife, and the proportion of women polygamously married increases with age. While most young women start married life monogamously, around 40% might expect to have at least one co-wife by their mid-thirties, if they follow the experience of preceding cohorts of women (Hemmings, 2007).

An ethnographic study in the area found that polygamy is not universally accepted, especially amongst the members of the Catholic Church (Hemmings, 2007). Some women expressed fear of gaining a co-wife, including jealousy, witchcraft and increase risk of sexually transmitted infections. Other women saw the benefit of sharing household duties, including farming and child care. Furthermore polygamy allowed women to remain at their husband's household with their children once the marriage was over, without having to divorce, and with some economic support from their husband (Hemmings, 2007). Interestingly, this study found that polygamy was often a response to disagreement in fertility aspirations between husband and wife, with the wife preferring a break from childbearing and the husband expressing an impatient desire for more children, leading him to search for an additional wife (Hemmings, 2007).

Data and Methods

This study uses data collected between October 2008 and September 2009 from a module on fertility intentions linked to an ongoing DSS. The DSS baseline census was conducted in 2002–2004 following which the population has been under continuous surveillance. Using the DSS, a population-based adult HIV and behaviour survey was started in the DSS area in September 2007 as part of a work programme focusing on HIV and infectious disease control in a rural African population (see Jahn *et al.* (2007) for details on the data collection procedures).

A set of questions to measure retrospective and prospective fertility intentions of couples was designed and piloted in 2008, using the local language. The data collection began on October 28th 2008. The design of the study permits the linking of couples' intentions and assessing the extent of agreement between couples in monogamous and polygamous relationships.

Women were asked questions on their current fertility (including total number of children ever born and surviving), their marital status (including how they got married; for example church/traditional wedding, inherited, eloped). Similarly, men were asked questions on total number of children and number of children with each of their current wives if in a polygamous relationship. A set of questions was also introduced to ascertain ever and current use of contraception. A section on prospective fertility intentions was introduced in order to assess whether or not the husband and wife separately wish to have another child and the preferred timing of the next birth. These questions were followed by questions on what each partner thinks is the desire of their spouse. A similar set of questions were introduced in the men's questionnaire, including separate preference questions for each wife.

This paper analyses the baseline round of data collection. The data were collected approximately one month after the re-census of that area, which included collection of socioeconomic data and identification of spouses. Individuals were not necessarily seen in person for the re-census and spouse identification.

This study was linked to an on-going data collection on sexual behaviour and HIV testing. In order to reduce refusal on the fertility-intention questions, respondents were allowed to answer these questions even if they refused to participate in HIV testing and the sexual behaviour component. The sample frame contained 4654 matched married couples of whom 2748 couples jointly agreed to take part in the fertility-intentions study. One-hundred and twelve couples were dropped because of mismatching information on the partner's identity, marital status or the name of the wife or husband, leaving 2636 matched couples for the analysis. The characteristics of the selected sample and the overall couples in the DSS were checked. The two samples do not differ much in terms of population characteristics, but polygamous couples, particularly HIV-positive couples, were more likely to refuse to take part in the survey. Adjustment for HIV status in the analysis should control for the potential selection effect due to the survey procedure.

The couples' intentions were analysed by bivariate analysis, and kappa statistics were used to assess the level of agreement in the couple's response. The kappa statistic is used to give a quantitative measure of the magnitude of agreement between two respondents or two observations. The calculation is done by comparing how much agreement is observed and how much agreement would be expected by chance alone

(‘expected agreement’). The observed agreement is the sum of the percentage of similar responses divided by the total. The kappa is the measure of this difference, standardized to be between -1 and 1 ; it usually ranges from 0 to 1 , where 1 is perfect agreement and 0 is the agreement you would expect by chance. A review by Becker (1996) found between 75 and 80% concordance in the couple’s desire for more children in couple studies in Africa.

In order to assess to what extent intentions are translated into behaviour, a logistic regression model was fitted with the outcome being ‘use of any modern method of contraception’. Explanatory variables included husband’s and wife’s preference to have another child, and their joint preference. Studies of the effect of partners’ intentions on current use of contraception highlight the importance of analysing both partner-specific intention and the joint intention of the couple. This specification allows the analysis of the role, and relative influence, of each partner’s intention in decision-making (Dodoo & Tempenis, 2002). This analysis was repeated for each marriage type, and whether it is the perception of spouse’s intention or the actual stated preference of the spouse that matters more in predicting use of contraception was assessed.

Results

A total of 2636 couples were successfully matched; 78% were married in a monogamous union and 22% in a polygamous union (17.6% with one co-wife and 4.7% with two or more co-wives with only 21 marriages with three co-wives). The analysis was restricted to 2243 couples where the wife was 15–49 years old and currently not pregnant.

Women married in a monogamous union are on average 3 years younger than those married in a polygamous union, while monogamous husbands are on average 4 years younger (see Table 1). Thirty-two per cent of wives in polygamous union had at least one previous union compared with only 16% of those in a monogamous union. This pattern confirms that polygamy is associated with high divorce and re-marriage rates (Pison, 1986).

Considering that spouses in polygamous unions tend to be older, Table 1 shows the level of fertility and child loss of the two marriage types after adjustment for the age difference. A significantly higher percentage of wives who were married in a polygamous than a monogamous union had previously experienced the death of a child (36% and 27% respectively). More than half of the men currently in a polygamous marriage had a previous experience of child death.

The average open birth interval is around 5 months shorter in a current polygamous union than in a monogamous union, and women married in a polygamous marriage had on average 3.5 children compared with 3.3 of their monogamous peers (see Table 1). Thus there is no suggestion in this study that polygamously married women are less fecund than the monogamous. Husbands in a currently polygamous marriage had on average 7.4 children in total (considering all children from current wives and past relationships) compared with 4.0 for men in a monogamous marriage. The average number of children of polygamous husbands with their current wives is 6.1, whereas the average number of children with the current wife of a monogamous husband is 3.1.

Table 1. Descriptive statistics of husbands and wives by type of marriage, Karonga, northern Malawi, 2008–9

	Monogamous marriage	Polygamous marriage	Both marriage types
Age			
Mean age of wife***	28.8	32.0	29.5
Mean age of husband***	35.2	39.4	36.1
Mean age difference b/w husband and wife***	6.4	7.3	6.6
Marriage characteristics			
Average marital duration (years)***	9.9	12.0	10.4
Age at current marriage (wife)***	19.8	21.1	20.0
Age at marriage (husband)***	26.3	28.5	26.7
Number of previous unions (wife)***			
One	16.7	32.5	20.1
Two or more	2.3	5.4	2.7
Number of previous unions (husband)^a***			
One	26.0	25.4	25.9
Two	10.2	11.9	10.6
Three or more	2.7	5.0	3.2
Previous fertility			
Mean number of months since last child (wife)	36.2	31.5	35.2
Mean number of living children (wife)***	3.3	3.5	3.4
Mean number of living children (total husband)***	4.0	7.4	4.7
Mean number of living children with current wife/wives (husband)***	3.1	6.1	3.7
<i>N</i>	1766	477	2243

^aThe number of previous unions for husband refers to all dead, divorced or separated wives.
 χ^2 test: *** $p < 0.001$.

Both men and women in polygamous marriages have on average a lower level of education than their monogamous counterparts; 20% of wives in polygamous marriages obtained less than 6 years of primary education compared with 15% of wives in monogamous marriages (see Table 2). Only 13% obtained a secondary level of education compared with 22% of the monogamously married women. Similarly, only 28% of polygamous husbands obtained secondary education compared with 44% of the monogamous.

As polygamous women tend to be older and have a higher parity than their monogamous counterparts the fertility preference by marriage type was analysed with and without adjusting for women's age and number of living children. Table 3 shows the predicted value of the percentage of women and men wanting no more children and their joint preferences. The responses of couples who wanted more children or were

Table 2. Age-adjusted educational characteristics by type of marriage, Karonga, northern Malawi, 2008–9

Education	Monogamous marriage	Polygamous marriage	Both marriage types
Wife's education***			
None/primary ≤5 years	14.5	20.0	15.7
Primary 6–8 years	64.4	66.6	64.8
Secondary	21.1	13.1	19.4
Husband's education***			
None/primary	9.4	10.9	9.7
Primary 6–8 years	46.6	61.3	49.7
Secondary	43.9	27.7	40.5
<i>N</i>	1766	477	2243

The table shows the predicted percentages for each category adjusting for wife's age. Predicted values were obtained by fitting a multinomial logistic regression for the wife's and husband's education adjusting for wife's age.

χ^2 test: *** $p < 0.001$.

undecided were combined together to simplify the reporting of the results. Before adjusting for age and number of living children, almost half of the polygamous women do not want any more children compared with 40% of monogamous women, but this difference disappears after adjustment. Husbands show a similar pattern of preference, with more than 50% of polygamous men wanting no more children compared with 37% of monogamous husbands; after adjustment polygamous husbands still show a higher propensity to stop childbearing than the monogamous group. As previously discussed, some studies (Timæus & Reynar, 1998; DeRose, 2007) found that wife rank matters in fertility attitudes. This hypothesis was tested, but it was found that the fertility preferences of first order and higher order wives were not significantly different.

A higher percentage (37%) of couples in polygamous union jointly express a desire for stopping than couples in a monogamous union (27%), but this difference disappears after adjustment for women's age and number of living children. However, even after adjustment, more couples in a monogamous than a polygamous union jointly want another child.

The kappa statistic was used to assess the level of agreement in couple response. The kappa of 0.50 for monogamous couples shows a moderate level of agreement. The level of agreement is much lower in polygamous couples, with a kappa of 0.38. The chance of agreement is highest when only two categories are allowed; in this case 'undecided' and 'want more' responses were merged together.

Partners' own fertility preferences are also likely to be influenced by their perceptions of the spouses' preferences. Some authors have hypothesized that an asymmetrical influence on each other's fertility intentions may exist due to 'under-appreciated mechanisms of dominance' (DeRose & Ezech, 2005). This situation is especially relevant in the absence of spousal communication; Table 4 shows the distribution of the perceived and actual disagreement between the partners about the desire to stop

Table 3. Adjusted and unadjusted fertility preference by type of marriage, Karonga, northern Malawi, 2008–9

	Monogamous marriage		Polygamous marriage		Both marriage types	
	Unadjusted	Adjusted ^a	Unadjusted	Adjusted ^a	Unadjusted	Adjusted ^a
Wife's preference***						
Wants no more	39.9	40.7	53.9	39.1	42.2	40.4
Undecided/wants more	53.6	58.1	47.2	59.8	56.2	58.5
Missing	1.5	1.0	1.9	1.1	1.5	1.0
Husband's preference***						
Wants no more	37.5	37.6	53.5	45.0	40.9	39.2
Undecided/wants more	60.2	60.2	42.9	51.4	56.6	58.2
Missing	2.3	2.3	3.6	3.3	2.5	2.5
Joint preference***						
Both want no more	26.8	23.4	36.9	24.4	29.0	23.7
Husband wants no more, wife wants more/undecided	10.0	13.5	15.1	20.1	11.1	14.8
Wife wants no more, husband wants more/undecided	11.8	16.0	9.0	14.2	8.0	15.7
Both want more/undecided	47.8	43.3	30.8	36.0	44.2	41.6
Don't know partner's wishes/missing	3.6	4.0	5.2	4.9	3.9	4.3
Agreement test						
Want no more/more or undecided						
Kappa/agreement	0.49/76.2		0.38/69.4		0.48/74.7	
Expected agreement	52.5		50.0		51.4	
<i>N</i>	1766		477		2243	

^aAdjusted for age and parity.

The undecided category includes cases where one or both partners are undecided. Predicted percentages are shown for each category adjusting for wife's age and number of living children.

χ^2 test: *** $p < 0.001$.

childbearing. The top left-hand cell of Table 4 shows that 29.9% of women desire to stop and think that their husband also wants to stop childbearing. The second and third rows in the left-hand column of Table 4 ($9.5 + 10.0 = 19.5\%$) show the percentage of responses in which wives think that their desires do not match with the husband. Hence, around 20% of women believe that their preference is not the same as their husband, the 'perceived disagreement'. The second column shows the husband's response and his perception of his wife's preference. The third column shows the actual personally reported joint preference of the couple, which provides a different measure of agreement from that based on perceptions of what the partner wants. In both marriage types, wives tend to have a higher perception of disagreement than their husbands (20% versus 15% in monogamous couples and 24% versus 9% in polygamous couples). Polygamous couples believe themselves to be in greater agreement with their

Table 4. Wives' and husbands' perceptions of partners' desire to stop childbearing by type of marriage, Karonga, northern Malawi, 2008–9

	Monogamous marriage			Polygamous marriage		
	Perceived desire		Actual desire	Perceived desire		Actual desire
	She says	He says		She says	He says	
Current desire						
Both want no more	29.9	32.2	26.8	35.2	48	36.9
Woman wants no more, partner wants more/undecided	9.5	5.1	11.8	15.3	4.2	11.9
Husband wants no more, partner wants more/undecided	10.0	9.9	10.8	8.1	5.0	15.1
Both want more/undecided	48.4	50.2	47.8	40.7	37.7	30.8
Don't know partner's wishes/missing	2.2	2.5	3.6	2.7	5	5.2
Total	100	100	100	100	100	100
Disagreement	19.5	15.0	21.7	23.5	9.2	27.0
Excluding 'don't know' responses	19.9	15.4	22.5	24.1	9.7	28.0
Want no more/kappa statistics	79.8/0.58	84.4/0.67	76.2/0.49	76.1/0.52	88.7/0.77	69.4/0.38

Table 5. Current use of modern method of contraception (as reported by wife) by joint preference for an additional child in monogamous and polygamous marriage, Karonga, northern Malawi, 2008–9

	% use of modern methods (all)		
	Monogamous marriage***	Polygamous marriage***	Both marriage types***
Both want no more	50.6	39.2	47.5
Husband wants no more, wife wants more/undecided	40.9	29.2	37.5
Wife wants no more, husband wants more/undecided	41.3	28.1	38.5
Both want more	44.7	36.7	43.5
Don't know partner's wishes/missing	23.8	28.0	25.0
Total	44.7	35.0	42.7

χ^2 test: *** $p < 0.001$.

partner's fertility preference than they actually are: the kappa statistic of the actual joint response falls to 0.38 (from 0.52 for what she perceives he wants, and 0.77 what he perceives she wants).

Although polygamous couples were more likely to express desires to stop childbearing than those in a monogamous union, current contraceptive use reported by wives or husbands was lower in the former group (35% versus 44% for wives and 38% versus 47% for husbands). In both types of marriage, agreement by spouses to have no more children raised use by 10% points (see Table 5). To check whether lower use among the polygamous reflected lower sexual activity the analysis was repeated for couples reporting coitus in the past three months, but the contraceptive use difference by marriage type remained unchanged.

Bivariate analysis

The bivariate analysis shows that contraceptive use is surprisingly high for couples who want more children. This could be partly due to the confounding effect of education and will be explored further in the multivariate analysis. Most analyses rely on the wife's report of use of contraception as it is assumed that she has more accurate knowledge of the actual use than the husband; however, husbands' reports of contraceptive use are also of interest, particularly when condoms are a common method. Table 6 shows the concordance in reported use of contraception between husband and wife. In monogamous couples, 70.9% of wives use contraception and the husband also reports use, whereas 28% of wives report contraception and he reports non-use. In polygamous couples the discrepancy is much higher; in 41% of cases where the wife reports use her husband reports no use. The kappa statistic for monogamous couples is around 0.42, which is considered a moderate/fair agreement, whereas for polygamous couples it is much lower at 0.31.

The greater disagreement in reported contraceptive use among polygamous unions might reflect a higher level of clandestine use in the former group. If this supposition is correct, greater use of injectables among polygamous is expected because this method

Table 6. Agreement on current use of contraception between husband and wife by marriage type, Karonga, northern Malawi, 2008–9

	Monogamous marriage***		Polygamous marriage***	
	Wife reports use	Wife reports no use	Wife reports use	Wife reports no use
Husband reports use	70.9	28.8	59.3	27.1
Husband reports no use	29.1	71.2	40.7	72.9
Total	100	100	100	100
Agreement	71%		68.1%	
Kappa	0.42		0.31	

χ^2 test: *** $p < 0.001$.

is the easiest to conceal from the husband. The data indeed show that a higher proportion of polygamous than monogamous couples use injectables (40% versus 30%) and a lower proportion use condoms (20% versus 37%). If clandestine use is common, it should be most apparent in couples where the wife wants to stop childbearing but the husband wants to have more children. In polygamous unions with this profile of joint preference, there is indeed a big gap between the wife's and husband's reporting of contraceptive use: 27% for wives and 10% for husbands, a gap of 17%. For monogamous couples the corresponding gap is only 4%. This contrast strongly suggests that clandestine use by polygamous wives is more common than by monogamous wives.

Multivariate analysis

Can the difference in contraceptive use be explained by marriage type? The difference in contraceptive use for monogamous and polygamous couples cannot be explained by preferences or demographic and educational factors. Model 1 in Table 7 shows that after controlling for couple's fertility intentions, spouse's age, marital duration, couple's HIV status and education status, polygamous couples have a lower use of contraception.

Men's dominance? The relative influence of wives' or husbands' reproductive desires on contraceptive use (as reported by the wife) and the difference in use between the two marriage types, are assessed by logistic regression in Model 1 of Table 7. Interestingly, the results show no evidence of a 'male dominant power' in reproductive decision. After adjustment for demographic and socioeconomic characteristics, it does not matter whether it is the husband or the wife who wants no more children; they are 40% less likely to use contraception than when both prefer to stop. When both want to have more children, use is significantly lower than when both want no more but nevertheless higher than when the couple's wishes are discordant. The spacing motive for contraceptive use is clearly important; 75% of women who want more wish to wait at least one year before the next pregnancy. Model 1 also shows that a significant difference of about 30% in the probability of using a modern contraceptive method between polygamous and monogamous couples persists even after adjustment for joint preferences and other factors. The results in Table A1 also show that wife's age, husband's age, wife's number

Table 7. Adjusted odds ratio for the probability of using a modern method of contraception for all marriage types, Karonga, northern Malawi, 2008–9

	Joint Model 1		Monogamous Model 2		Polygamous Model 3	
	OR	β	OR	β	OR	β
Joint fertility preference						
Both want no more (Ref.)	1		1		1	
Husband wants no more, wife wants more/undecided	0.57**	(0.10)	0.61**	(0.14)	0.45**	(0.15)
Wife wants no more, husband wants more/undecided	0.63***	(0.11)	0.68**	(0.13)	0.42**	(0.18)
Both want more/undecided	0.70*	(0.11)	0.77	(0.13)	0.50**	(0.20)
Don't know partner's wishes/missing	0.43***	(0.12)	0.38***	(0.12)	0.69	(0.36)
Marriage type						
Monogamous (Ref.)	1					
Polygamous	0.71**	(0.10)				
Spouse's age						
Wife's age	0.95***	(0.01)	0.96**	(0.01)	0.94**	(0.03)
Husband's age	0.98***	(0.01)	0.977**	(0.01)	0.96*	(0.02)

OR: odds ratio.

The model controls for marital duration, fertility, infant mortality, wife's HIV status, husband's HIV status, wife's education and husband's education.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

of living children and wife's previous experience of child death are significant predictors of use of contraception. Wives with upper secondary level of education have 1.7 higher odds of using contraception than wives with only primary or no education. Also, wife's characteristics are much more important in predicting contraceptive use than husband's characteristics; once wife's characteristics are controlled for, husband's characteristics are no longer important (results not shown).

In order to assess the magnitude of relative power of husbands or wives in the two marriage types, the model was re-estimated separately for monogamous and polygamous couples (Models 2 and 3 in Table 7). After controlling for socioeconomic and demographic characteristics, couple disagreement on whether to have another child depresses contraceptive use more for polygamous couples than for monogamous ones (50% or more less likely versus 30–40% less likely compared with use where the joint preference is to have no more).

In terms of socio-demographic characteristics, it was found that the effect of the wife's number of living children was significant only in monogamous marriages, whereas, for polygamous marriages, the number of living children of the husband was more impor-

tant (though only significant at the 10% level). Wife's education is more important than husband's education in both marriage types (Table A1).

Actual agreement or disagreement or perceived disagreement? In the previous section it was found that monogamous and polygamous couples have similar fertility preferences after adjustment for age and number of living children, with a tendency for polygamous husbands to want no more children. On the other hand, despite similar fertility preferences, polygamous couples tend to have a lower use of contraception than monogamous couples. The kappa statistics suggest that this gap could be partly explained by the fact that perceived agreement is a stronger predictor of use than actual agreement (i.e. the joint preference). This question is equally relevant for both marriage types. Model 1 in Table 7 shows that probability of use drops by 30% when there is actual disagreement. By how much does it drop when the disagreement is perceived? In order to assess whether perceived agreement is a better predictor of contraceptive use than actual agreement, first it was assessed whether it was the wife's or the husband's perception that was a better predictor of use. It is found that wife's perception of husband's intentions were more important than husband's perception of wife's intention. However, the perception of the spouse's intention model did not provide a better fit than the model that used the actual stated preference (see Table A1).

This hypothesis was further tested by replicating the analysis with only those couples who agree or perceived they agree and see whether the difference in use of contraception between marriage types disappears. The difference in contraceptive use between monogamous and polygamous couples reduces slightly when actual agreement is considered, but is still significant when perceived agreement, both from the wife's and husband's point of view, is considered (Tables A1 and A3).

Conclusion

The analysis of matched couple data is complex and particularly so when data are available on respondents' own wishes and on perceptions of partners' wishes. Before discussing the results it may be helpful to summarize answers to the five research questions posed in the Introduction.

- (1) Husbands' fertility preferences do not differ substantially from those of wives in either monogamous or polygamous marriages. After adjustment for age and living children, fertility preferences are similar in both marriage types.
- (2) Polygamous couples disagree more often about future childbearing than monogamous couples, but this difference disappears when perceived agreement is considered.
- (3) Husbands and wives report similar overall levels of contraceptive use, but use is much lower in polygamous than monogamous marriages. However, this difference cannot be explained by preferences, or by demographic and educational factors.
- (4) Husbands and wives are much more likely to disagree in the reporting of current contraceptive use in polygamous than in monogamous marriages and one reason may be greater resort to use that is concealed from husbands by polygamous wives.

- (5) In both marriage types, contraceptive use is highest when both partners state a desire to stop childbearing. When the desire for more children differs between spouses, the probability of use drops significantly and rather more so in polygamous marriages. In cases of spousal disagreement about the desirability of future childbearing, the influence of the husband's wishes on contraceptive use is of the same magnitude as that of wives, in both types of marriage. Perceived differences in couple's intention are not a better predictor of contraceptive use than actual preferences.

As previously discussed, the analysis focuses on the effect of marriage type at the individual level. It was not possible to deduce anything about the possible contextual effect of the marriage system. In this particular setting, the institution of polygamy is not universally accepted (Hemmings, 2007). On the contrary, it is contested and, while it is true that some currently monogamous women will become polygamous, the majority will not. In such a setting, investigation of differences in reproductive attitudes and behaviour between those in polygamous and monogamous unions is both valid and important.

Regarding one of the central questions of this paper, it is found that once women's age and number of living children are controlled for there is no difference in fertility preferences between the two marriage types, but polygamous couples, everything else being equal, have a lower use of contraception. This contraceptive-use gap is not explained by the higher level of disagreement in polygamous couples, or by a difference in the influence of perception of disagreement. Wolff *et al.* (2000), in their Ugandan study, found that disagreement might be more perceived than real and might result in an overestimation of partner's desire for additional children. What is found here in the polygamous couples' responses is that the husband and wife perceive themselves to be in more agreement than they actually are, and the same applies to a lesser extent to monogamous couples too. In addition, it is found that wives in polygamous union opt for a more covert method in order to fulfil their reproductive intention. Hence, reinforcing the main findings, if polygamous women did not clandestinely use contraception, the contraceptive-use gap could be even bigger. However, despite higher clandestine contraceptive use among polygamous than monogamous wives, no evidence is found to support the common belief that the former group are particularly disadvantaged in terms of gender-related imbalance in reproductive power.

This study confirms the findings from other studies that show a couple's decision-making process is different in monogamous and in polygamous couples (Mott & Mott, 1985; Anderton & Emigh, 1989; Garenne & van der Walle, 1989; Dodoo 1998; Agadjanian & Ezeh, 2000). Specifically, it is found that the translation of preferences into behaviour is less strong in polygamous couples, leading to a lower use of contraception. Despite similar stated preferences the strength of the desire to stop childbearing may be greater in the monogamous group than the polygamous group.

What these findings also suggest is that the perception of costs of children is different in the two marriage types. This could be due to the different child care and work responsibilities in the polygamous marriage system, which are shared amongst co-wives, and this sharing reduces perception of the cost of children, which in turn contributes to higher fertility amongst the polygamous group (Bledsoe & Pison, 1994; Radcliffe *et al.*, 2000). However, quantitative data such as those collected as part of this study can only

provide fertility intentions, and are not appropriate to understand sociological processes and underlying behavioural differences between the two marriage types. Anthropological studies are better placed to unravel the intensity and meaning of fertility intentions in monogamous and polygamous couples.

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Appendix 1

Table A1. Effect of wife's, husband's and joint preference on contraceptive use, by marriage type, Karonga, northern Malawi, 2008–9

	Wife only Model 1		Husband only Model 2		Joint Model 3		Monogamous Model 4		Polygamous Model 5	
	OR	β	OR	β	OR	β	OR	β	OR	β
Wife's fertility preference										
No more (Ref.)	1									
Yes/undecided	0.77**	(0.09)								
Missing	0.30**	(0.15)								
Husband's fertility preference										
No more (Ref.)										
Yes/undecided			0.82*	(0.08)						
Missing			0.60*	(0.18)						
Joint fertility preference										
Both no more (Ref.)					1		1		1	
Husband no more, wife more/undecided					0.57**	(0.10)	0.61**	(0.14)	0.45**	(0.15)
Wife no more, husband more/undecided					0.63***	(0.11)	0.68**	(0.13)	0.42**	(0.18)
Both want more/undecided					0.70*	(0.11)	0.77	(0.13)	0.50**	(0.20)
Don't know partner's wishes/missing					0.43***	(0.12)	0.38***	(0.12)	0.69	(0.36)
Marriage type										
Monogamous (Ref.)	1		1		1					
Polygamous	0.70***	(0.08)	0.60***	(0.08)	0.71**	(0.10)				
Spouse's age										
Wife's age	0.94***	(0.01)			0.95***	(0.01)	0.96**	(0.01)	0.94**	(0.03)
Husband's age			0.96***	(0.01)	0.98***	(0.01)	0.977**	(0.01)	0.96*	(0.02)
Marital duration										
	1.01	(0.01)	1.01	(0.01)	1.01	(0.01)	1.01	(0.013)	1.01	(0.02)
Fertility										
Wife's number of living children	1.2***	(0.04)			1.21***	(0.05)	1.25***	(0.061)	1.09	(0.09)
Husband's number of living children			1.06***	(0.02)	1.01	(0.03)	1.00	(0.03)	1.07*	(0.04)

Table A1. Continued

	Wife only Model 1		Husband only Model 2		Joint Model 3		Monogamous Model 4		Polygamous Model 5	
	OR	β	OR	β	OR	β	OR	β	OR	β
Infant mortality										
Wife's experience of child death	1.05	(0.11)			1.16	(0.14)	1.10	(0.16)	1.31	(0.31)
Husband's experience of child death			0.91	(0.09)	0.91	(0.10)	0.89	(0.12)	0.868	(0.20)
Wife's HIV status										
Negative (Ref.)	1				1		1		1	
Positive	1.11	(0.21)			1.01	(0.23)	0.97	(0.247)	1.7	(0.91)
Don't know	1.35*	(0.23)			1.32	(0.24)	1.31	(0.262)	1.2	(0.64)
Husband's HIV status										
Negative (Ref.)			1		1		1		1	
Positive			1.08	(0.18)	1.19	(0.24)	1.53*	(0.35)	0.37*	(0.19)
Don't know			1.12	(0.14)	1.04	(0.14)	1.11	(0.17)	0.75	(0.26)
Wife's education										
Primary/none (Ref.)	1				1		1		1	
Secondary	1.26*	(0.15)			1.16	(0.15)	1.20	(0.18)	1.15	(0.30)
Upper secondary	1.96***	(0.30)			1.69***	(0.28)	1.69***	(0.32)	2.21**	(0.86)
Husband's education										
Primary/none (Ref.)			1		1		1		1	
Secondary			1.10	(0.16)	1.04	(0.16)	1.08	(0.19)	0.88	(0.30)
Upper secondary			1.43	(0.22)	1.24	(0.20)	1.28	(0.23)	0.95	(0.37)
Constant	1.99**	(0.58)	1.99**	(0.54)	2.61***	(0.92)	1.91***	(0.79)	8.417***	(6.94)
N	2243		2243		2243		1766		477	
χ^2	94.08***		61.42***		120.91***		86.309***		42.39***	
Bic	3060.1		3092.7		3110.4		2499.6		704.8	

OR: Odds ratio.

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table A2. Effect of wife's, husband's and joint preference on contraceptive use for couples who agree, for those where she thinks they agree, or for those where he thinks they agree, Karonga, northern Malawi, 2008–9

	Model with only those who agree (both no more/both more)		Model with only those who SHE THINKS THEY agree (both no more/both more)		Model with only those who HE THINKS THEY agree (both no more/both more)	
	OR	β	OR	β	OR	β
Marriage type						
Monogamous (Ref.)	1		1		1	
Polygamous	0.755*	(0.126)	0.676***	(0.102)	0.633***	(0.100)
Spouse's age						
Wife's age	0.959**	(0.016)	0.958***	(0.014)	0.955***	(0.015)
Husband's age	0.980*	(0.012)	0.974**	(0.011)	0.977**	(0.011)
Marital duration	1.018	(0.013)	1.022*	(0.012)	1.025**	(0.013)
Fertility						
Wife's number of living children	1.220***	(0.059)	1.239***	(0.052)	1.210***	(0.056)
Husband's number of living children	1.019	(0.031)	1.019	(0.029)	1.029	(0.030)
Infant mortality						
Wife's experience of child death	1.142	(0.169)	1.181	(0.159)	1.185	(0.165)
Husband's experience of child death	0.939	(0.129)	0.960	(0.122)	0.856	(0.112)
Wife's HIV status						
Negative (Ref.)	1		1		1	
Positive	1.219	(0.329)	1.223	(0.292)	0.978	(0.263)
Don't know	1.530*	(0.341)	1.561**	(0.319)	1.415*	(0.296)
Husband's HIV status						
Negative (Ref.)	1		1		1	
Positive	1.113	(0.279)	1.176	(0.260)	1.175	(0.280)
Don't know	0.990	(0.169)	1.116	(0.172)	1.011	(0.164)
Wife's education						
Primary/none (Ref.)	1		1		1	
Secondary	1.079	(0.168)	1.125	(0.161)	1.057	(0.155)
Upper secondary	1.496**	(0.299)	1.675***	(0.313)	1.428*	(0.274)
Husband's education						
Primary/none (Ref.)	1		1		1	
Secondary	0.986	(0.182)	1.185	(0.204)	1.075	(0.189)
Upper secondary	1.264	(0.244)	1.429**	(0.257)	1.245	(0.231)
Constant	1.886*	(0.650)	1.605	(0.518)	2.148**	(0.712)
N	1567		1829		1696	
χ^2	54.599***		92.210***		71.354***	
Bic	2231.828		2530.716		2386.212	

OR: Odds ratio.

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table A3. Odds ratio for use of modern method of contraception by joint preference of husband and wife, by perceived preference by wife and perceived preference by husband in different marital unions, Karonga DSS, 2008–9

	Joint preference: actual response		Joint preference: as perceived by wife		Joint preference: as perceived by husband	
	Monogamous Model 6	Polygamous Model 9	Monogamous Model 10	Polygamous Model 11	Monogamous Model 12	Polygamous Model 13
Joint fertility preference (Ref.: both no more)						
Wife no more, husband more/don't know	0.687** (0.124)	0.422** (0.153)	0.599*** (0.114)	0.865 (0.273)	1.013 (0.193)	0.792 (0.375)
Husband no more, wife more/don't know	0.614** (0.121)	0.450** (0.151)	0.625** (0.123)	0.614 (0.251)	0.729 (0.177)	1.021 (0.515)
Wife undecided/husband undecided, both more	0.797 (0.130)	0.574* (0.181)	0.741** (0.112)	0.618* (0.180)	0.771* (0.107)	0.732 (0.192)
Wife wants more/husband undecided–Husband wants more/wife undecided	0.586 (0.197)	0.191*** (0.120)	0.557 (0.241)	0.437 (0.313)	0.964 (0.405)	0.251* (0.210)
Don't know partner's wishes/missing	0.379*** (0.123)	0.691 (0.360)	0.284*** (0.125)	0.454 (0.383)	0.432** (0.154)	1.109 (0.530)
Spouse's age						
Wife's age	0.961** (0.016)	0.936** (0.027)	0.961** (0.015)	0.940** (0.026)	0.963** (0.015)	0.940** (0.027)
Husband's age	0.976** (0.011)	0.966* (0.019)	0.975** (0.011)	0.966* (0.018)	0.977** (0.011)	0.966* (0.019)
Marriage type (Ref.: monogamous)						
Marital duration	1.014 (0.013)	1.010 (0.021)	1.015 (0.013)	1.014 (0.021)	1.014 (0.013)	1.011 (0.021)
Fertility						
Wife's number of living children	1.246*** (0.061)	1.072 (0.088)	1.237*** (0.060)	1.073 (0.089)	1.238*** (0.059)	1.097 (0.086)
Husband's number of living children	1.004 (0.035)	1.073* (0.045)	1.004 (0.035)	1.072* (0.044)	1.001 (0.035)	1.072* (0.044)
Wife's experience of child death	1.097 (0.159)	1.306 (0.311)	1.087 (0.158)	1.237 (0.293)	1.092 (0.158)	1.278 (0.303)
Husband's experience of child death	0.897 (0.123)	0.866 (0.199)	0.902 (0.123)	0.871 (0.200)	0.899 (0.123)	0.859 (0.197)

Table A3. *Continued*

Wife HIV positive (Ref.: negative)	0.971 (0.247)	1.724 (0.920)	0.971 (0.248)	1.643 (0.872)	0.968 (0.245)	1.879 (0.987)
Don't know	1.307 (0.261)	1.207 (0.643)	1.267 (0.253)	1.174 (0.622)	1.315 (0.262)	1.151 (0.612)
Husband HIV positive (Ref.: negative)	1.529* (0.354)	0.366* (0.189)	1.451 (0.334)	0.434 (0.223)	1.493* (0.342)	0.390* (0.201)
Don't know	1.115 (0.173)	0.747 (0.268)	1.137 (0.176)	0.753 (0.267)	1.084 (0.168)	0.762 (0.272)
Wife's education (Ref.: primary/none)						
Secondary	1.203 (0.184)	1.160 (0.301)	1.196 (0.183)	1.062 (0.276)	1.220 (0.186)	1.117 (0.285)
Upper secondary	1.690*** (0.323)	2.221** (0.863)	1.663*** (0.318)	1.983* (0.765)	1.682*** (0.321)	2.099* (0.801)
Husband's education (Ref. = primary/none)						
Secondary	1.078 (0.188)	0.887 (0.303)	1.099 (0.192)	0.902 (0.307)	1.094 (0.191)	0.912 (0.309)
Upper secondary	1.279 (0.233)	0.962 (0.371)	1.297 (0.236)	1.048 (0.397)	1.300 (0.236)	0.997 (0.383)
Constant	2.023* (0.807)	9.692*** (7.978)	2.210** (0.865)	6.857** (5.436)	1.792 (0.668)	5.423** (4.179)
<i>N</i>	1766	477	1766	477	1766	477
χ^2	85.371***	41.118***	86.924***	32.095**	79.438***	32.108**
Bic	2500.625	706.126	2499.072	715.149	2506.558	715.135

OR: odds ratio.

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.