The Polygyny-Fertility Hypothesis: New Evidences from Nigeria

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Abstract
Contraceptive use and an ideal number of children are among the factors that significantly influence the fertility of a country. Sub-Saharan Africa in general and Nigeria in particular are noted for polygynous marriages. The relationship between polygyny and fertility is well documented in literature. However, the influence of polygyny on fertility in Nigeria is yet to receive adequate academic attention. This paper sets out to re-examine the polygyny-fertility hypothesis. Data were sourced from the 2013 Nigeria Demographic and Health Survey, which was a nationally representative survey of women of reproductive age (15-49). The survey interviewed women on fertility, family planning, marriage history, and maternal and child health. The 26,403 married women that provided responses on questions concerning marital unions and fertility behavior constitute the sample for the study. The findings show that although marriage type has no significant effect on the fertility of married women, rank among wives in polygynous unions significantly influence fertility with the first wife being more prolific than subsequent wives. Population policies aimed at reducing high fertility should factor in the role of polygyny and competition among wives for higher number of children.

Keywords: Polygyny, fertility, contraceptive use, reproductive health, cultural factor

Introduction

According to the polygyny-fertility hypothesis, fertility is lower among married women in polygynous unions than among monogamously married women. For more than 60 years, demographers, anthropologists and sociologists have attempted to re-examine this widely held hypothesis (Lorimer, 1954, Bean & Mineau, 1986; Sichona, 1993; Tertilt, 2005; Whitehouse, 2018). The results of their academic inquiry have instigated a number of arguments and critiques in population research. While Lorimer (1954) for instance, reported lower fertility among polygynously married women, Bean and Mineau (1986) found a lower average level of fertility in polygynous unions. Others, such as Sichona (1993) found polygynously married women to be as fertile as those in monogamous marriage, while Tertilt (2005) and Whitehouse (2018) found polygyny to increase fertility by adopting a transformed notion in modernized settings. The implication is that the

evidence that polygyny reduces fertility remains inconclusive. Thus, in this paper, we present new evidence from Nigeria, the country with the largest population in Africa (United Nation, 2013), where polygyny is widely practiced (Okafor, 2013). More importantly, scholars have paid little attention to a re-examination of the hypothesis in the Nigerian context.

The polygyny-fertility hypothesis is contentious probably because, on the one hand, different scholars may have adopted different control variables and/or dissimilar measures of fertility in their studies, while on the other, different intervening variables may have played roles in their findings. Juayire (2014) opined that the variation in fertility among polygynous married women and those in monogamous marriage could be explained by intervening variables: frequency of intercourse, age differences between spouses, sub-fecundity or sterility, use of contraceptives, abstinence, and marital instability. Others include the desire for more children and the socio-cultural and economic determinants of fertility (Michael and Scent, 2017).

The relationship between polygyny and fertility could become apparent when considerable attention is given to methodological, socio-economic and demographic issues. The understanding of polygyny-monogamous fertility dichotomy requires a keen consideration to locale and the number of unions a married woman must have entered in her lifetime. This is because the number of times a woman re-marries may have a substantial effect on the number of children she may have during her reproductive age. Demographically, the period a woman is out of marital union is often accompanied with either no pregnancy or fewer pregnancies compared to when she is in a marriage (Isiugo-Abanihe, 1998).

The polygyny-fertility hypothesis remains complex in Nigeria and may remain this way except the positions of women in marital unions are understood in relation to societal transition. This is in light of the fact that societal shift is often associated with a change in women's socio-economic and demographic status (Adegoke, 2013). Consequently, the factors that prompted women to marry a married man in the past such as the desire for more children may likely be different from the factors that trigger such behaviour in today's society. Blanc and Gage (2000) asserted that the dynamics of polygyny cannot be fully understood without paying considerable attention to women's position and why they are involved in polygyny unions. Ferraro (1991) for example reported that men benefit differently from polygyny and that women are less likely than men to opt for it. Ferraro's point sounds clear and simple, but the reasons why women enter into polygynous union remains unattended to, and the effects on their reproductive behaviour are uncertain. Hence, the understanding that a monogamous married wife is a potential polygynous spouse in as much as she remains in the union.

The effects of the involvement of women in polygyny vary. Women may benefit or suffer in polygynous marriage depending on the availability of resources and how these resources are shared among the co-wives (Gibson and Mace, 2006). In a situation where there is an even distribution of resources,

equal benefits may occur. However, it should be noted that it is difficult for a man to equally share resources, sex and affection among his wives. Bove and Valeggia (2008) argued that equal love and affection is difficult in polygynous marriages as a man may love one wife more than others. Lardoux and Van De Walle (2003) found that the youngest and the most beautiful wives usually receive more attention than the older ones. The implication is that, the more the affection, the more likely the frequency of coitus, and the more likely her chances of becoming pregnant and bearing children. This also should not be unquestionably accepted without scientific interrogation because the period which the first wife may have spent in the marriage before the arrival of subsequent wives or an additional wife could have exposed her (the first wife) to high fertility, especially if she is fecund and had engaged in frequent sexual activities without contraceptive use. Indeed, Gibson and Mace (2006) found senior wives to be more fertile than their junior counterparts.

From the foregoing, there is a difficult association between polygyny and fertility. The link remains inarguably complex. As a result, this study re-assesses the polygyny-fertility hypothesis among married women in Nigeria by employing relevant statistics on considerable variables in order to clarify issues of contention.

Theoretical Framework

This study is situated within Weber's Social Action and Coleman's Rational Choice Theories. The theories explain the interaction between polygyny and fertility in a social context. Weber perceives social action as behaviour and reaction of individuals that take into consideration the behavioural stimulus and response of others. The theory proposes that individuals act on the basis of meanings arrived at through interaction. That is, actions are triggered by motives during interaction rather than by reflex or cultural norms. Although, the Nigeria society may permit polygyny, to a large extent the individual's choice or preference for a type of marriage is also important. Hence, the motive to marry many wives or have high fertility could be appreciated via understanding individuals' actions, accounting for environment, social, *value* and *means-ends rationality* (Ritzer, 2008). The Rational Choice Theory also indicates the primacy of micro levels of analysis which emphasizes that individuals act intentionally to achieve expected goals by maximizing benefits and minimizing costs within the calculus of preference and value (Ritzer, 2008). This theory holds that the decision to remain in polygynous union or bear children in/outside marriage is within the calculus of preference and value after the underscore of costs and benefits analysis with or without an adequate understanding of the implication of choice.

Data and Methods

The data for this study were gotten from the 2013 Nigeria Demographic and Health Survey (NDHS), a nationally representative sample survey of women aged 15-49. The survey was carried out by the National Population

Commission (NPC), Nigeria. ICF International provided technical and financial assistance for the survey through the USAID-funded MEASURE DHS program (NPC and ICF International, 2014). The survey collected data on individual marital status, fertility, contraception, health and other family histo-

Table 1: Definition of variables used in analysis

Independent Variables	***Coding***
Residence	Urban =1, Rural =2.
Age	15-19 =1, 20-29 =2, 30-39 =3, 40-49 =4.
Ethnicity	Hausa =1, Yoruba=2, Igbo=3, Other =4
Education	None = 0, Primary =1, Secondary+ =2
Husband's education	None=0, Primary=1, Secondary+ =2
Type of marriage	Monogamous = 0, Polygyny = 2
Work status	Not working = 0, Working = 1
Religion	Catholic =1, Other Christian =2, Islam =3, Other =4
Age at first birth	≤19 years =1, 20-29 years =2, 30 years and more =3
No. of living children	None = 0, 1-2 =1, 3-4=2, 5+ =3
No. of times married	Once = 1, More than one = 2
Ideal no. of children	≤ 4 =1, 5 = 2, 6 or more =3
Wanted last child	Wanted then =1, Wanted later =2, Wanted no more =3
Desire for more children	Wanted no more = 0, Otherwise =1
Husband's desire for children	Both want same =1, Husband wants more =2, Husband wants fewer =3, Don't know = 4
Number of wives	One wife =1, Two wives =2, Three wives or more =3
Rank among wives	Rank 1 =1, Rank 2 =2, Rank 3 or more =3
Contraceptive method used (current used by method)	No method = 0, Traditional = 1, Modern = 2 **Note:** *Modern contraceptive includes*: female sterilisation, male sterilisation, the intrauterine device (IUD), the pill, injectables, implants, the diaphragm, male condoms, female condoms, the lactational amenorrhoea method (LAM), foam/jelly, and emergency contraception.
	Traditional contraceptive includes: withdrawal methods and rhythm (periodic abstinence).
Dependent Variable:	None = 0, 1 or more =1
Total number of children ever born	

ries. About 68% (26,403) of the sample population were married as at the time of the survey, 65.9% (17,411) were in monogamous unions while 34.1% (8,992) were in polygynous marriages. The currently married sample constitutes the data analysed in this paper. Data were analysed at the univariate, bivariate and multivariate levels. See Table 1 for the definition of key variables as used in the multivariate regression analysis.

Results

Table 2 shows the socio-demographic characteristics of currently married women. The sample includes women in monogamous and polygynous unions. Those in polygynous marriage were sub-grouped into two: 'two wives' and 'three wives or more'. More than half of our samples (65.9%) were in monogamous unions. While 26.2 percent were in two wives unions, 7.8 percent were in three or more wives unions. The disparity in monogamous and polygynous unions reflects a gradual decline of polygyny in Nigeria which may be due to the influence of modernity and westernization. More women in monogamous unions reside in urban areas (76.4%) than in rural areas (60.5%). The number of wives in polygynous unions decreases in urban areas. For instance, while 17.0 percent of two wives reside in urban areas, 31.1 percent of two wives reside in the rural areas.

Women in monogamous unions decrease as age increases. Those in the polygynous unions, in both two wives and three wives or more, increase as age advances. Among women within the monogamous unions, the number of married women decreases from 73.6% for women aged 15-19 to 58.5% for women aged 40-49. Those in 'two wives' and in 'three wives or more' increased from 22.6% and 3.9% for women aged 15-19 to 29.3% and 12.2% for women aged 40-49 respectively. The age distribution indicates that some women who are in the polygynous unions may have either been in monogamous unions before their husbands married a second wife or may have experienced marital separation/divorce or spousal death. One of both reasons prompted them to re-marry a married man. It may also indicate that some women who were at least second wives in their first marriages were more likely to be those with advanced ages.

The Igbo ethnic group has the highest number of monogamous married women (89.0%) while Hausas have the least (53.1%). In the 'two wives' and 'three wives or more' categories, the Hausas have the highest percent of polygynous marriages (37.4% and 9.4% respectively). This could be attributed to the influence of religion (Islam) and culture. Islam permits marriage to more than one wife and is widely practiced among the Hausas. The Igbo are mostly adherents of Christianity which strongly advocates monogamy. Monogamous marriages are directly proportional to the increase in the education of women. About 54 percent of women in monogamous unions with no education increases to 84 percent for those with secondary education or more. A similar result is found among the polygynous categories. There are more uneducated women in polygynous unions than in monogamous ones. This shows that education influences polygynous marriages.

Members of the Catholic Church (84.2%) and Other Christians (81.0%) practice monogamous marriages than Muslims (55.3%) and those affiliated with Other religions (56.2%). Adherents of Islam practice polygyny the most. This as earlier explained is based on the fact that Islam permits polygyny. There is an insignificant difference between the working and 'not working' women within the monogamous union category. However, while 65.7 percent

of working women are in a monogamous union, 25.8 percent are in 'two wives' union and 8.4 percent in 'three or more wives' union. This shows that working women are more likely to be in monogamous unions than their 'not working' counterparts.

While 74.8 percent (being the highest) of women in monogamous unions have their first births at age 30 or more, 30.6 percent (being the highest) in 'two wives union' and 8.8 percent (being the highest) in 'three wives union' have theirs at age 19 or below. Early birth occurrences among polygynous unions may be due to competition among the newly married wives to impress their husbands with early child births. This can be explained by the fact that in Nigeria, a woman is believed to be a 'complete' wife with rights to her husband's properties if only when she has children, particularly male children for him. Husband's education is also directly proportional monogamous unions. The number of women with no 'living' children (72.6%) and 1-2 living children (72.9) is higher in monogamous unions. More so, while one time of marriage is highest in monogamous unions (69.6%); it is lowest in 'three or more wives' union (6.4%).

Table 2: Percentage distribution of married women by selected socio-demographic characteristics and types of union

Characteristics	Women in monogamous unions (1 wife)	Women in polygynous unions		Total no. of women (100%)
		2 wives	3 wives or more	
All women	65.9 (17411)*	26.2 (6924)*	7.8 (2068)*	26,403
Residence				
Urban	76.4 (6947)	17.0 (1545)	6.7 (605)	9097
Rural	60.5 (10464)	31.1 (5379)	8.5 (1463)	17306
Current age				
15-19	73.6 (1450)	22.6 (445)	3.9 (76)	1971
20-29	71.4 (6757)	23.5 (2222)	5.1 (478)	9457
30-39	63.5 (5595)	27.9 (2454)	8.6 (762)	8811
40-49	58.5 (3609)	29.3 (1803)	12.2 (752)	6164
Ethnicity				
Hausa	53.1 (4310)	37.4 (3037)	9.4 (764)	8111
Yoruba	73.4 (2495)	19.7 (670)	6.9 (234)	3399
Igbo	89.0 (2476)	7.2 (199)	3.8 (106)	2781
Other	67.1 (8130)	24.9 (3018)	8.0 (964)	12112
Education				
None	53.2 (6627)	37.0 (4619)	9.8 (1221)	12467
Primary	67.1 (3597)	24.4 (1305)	8.5 (457)	5359
Secondary+	83.8 (7187)	11.7 (1000)	4.5 (390)	8577
Religion				
Catholic	84.2 (1818)	11.3 (243)	4.6 (99)	2160
Other Christian	81.0 (6856)	13.6 (1148)	5.4 (455)	8459
Islam	55.3 (8505)	35.2 (5407)	9.5 (1459)	15371
Other	56.2 (232)	30.5 (126)	13.3 (55)	413
Work status				
Not working	66.6 (5161)	27.1 (2103)	6.3 (488)	7752
Working	65.7 (12186)	25.8 (4794)	8.4 (1567)	18547
Age at First Birth				
≤19	60.6 (8719)	30.6 (4401)	8.8 (1271)	14391
20-39	71.6 (6559)	21.5 (1967)	6.9 (636)	9162
40+	74.8 (2133)	19.5 (556)	5.6 (161)	2850
Husband's				

education				
None	53.4 (5410)	37.1 (3754)	9.5 (965)	10129
Primary	64.7 (3233)	26.3 (1312)	9.0 (450)	4995
Secondary+	77.7 (8768)	16.5 (1858)	5.8 (653)	11279
No. of living children				
None	72.6 (1792)	21.7 (535)	5.8 (143)	2470
1-2	72.9 (5809)	21.7 (1725)	5.4 (433)	7967
3-4	65.1 (5117)	26.8 (2106)	8.1 (640)	7863
5+	57.9 (4693)	31.6 (2558)	10.5 (852)	8103
No. of times married				
Once	69.6 (16123)	23.9 (5543)	6.4 (1487)	23153
More than once	39.6 (1168)	43.1 (1271)	17.3 (511)	2951

*No. of women in parentheses

Table 3 shows the results of the bivariate analysis of currently married women's characteristics by marriage types and number of children ever born. The results indicate that place of residence, number of times married, education of women, education of husbands, the ideal number of children, wanted last child, desire for more children, and use of contraceptives significantly varied by monogamous and polygynous marriage types and number of children ever born. In both monogamous and polygynous unions, 5 or more children ever born are higher among rural dwellers (37.9%) than among urban dwellers (29.4%). A total number of children ever born increases as women's age advances. While 5 or more children ever born is highest among women aged 40-49, none children ever born is highest among women aged 15-19 in both monogamous and polygynous unions. While ≤4 children ever born are higher among women with once times of marriage (66.8% and 49.5% for monogamous and polygynous unions respectively), 5 or more children ever born is higher among those with more than once marital union (52.8% and 57.0% for monogamous and polygynous unions respectively).

In both unions, while 1-4 children ever born are highest among women with at least secondary education, 5 or more children ever born are highest among women with no formal education (43.2% and 55.6% for women with no formal education in monogamous and polygynous unions respectively). This means that education lowers the fertility of women. For women with 1-2 ever born children in both monogamous and polygynous unions, 4 or less is their ideal number of children (44.8% and 34.6% for each union respectively). Women with six or more ideal number of children are highest among those with 5 or more children ever born in both monogamous and polygynous unions (45.5% and 57.5% respectively). This means that women's ideal number of births influences their fertility levels.

Women who wanted no more children are highest among those with 5 or more children ever born in both monogamous and polygynous unions (82.0% and 91.4% respectively). While women who wanted their last child at the time of birth is highest among those with 1-2 children ever born in a monogamous union (37.9%), those who wanted theirs at the period of birth is highest among women with 5 or more children in a polygynous union (51.3%). Similarly,

women who desire for no more children is highest among those with 5 or more children ever born in both unions (69.2% and 79.5% respectively). In sum, no method of contraceptive use is highest among women with 5 or more children ever born in monogamous and polygynous unions (33.8% and 51.2% respectively) while the modern method of contraceptive use is highest among those with 5 or more children in both unions (38.4% and 60.1% respectively). These results indicate that women in monogamous union use more modern contraceptives methods than those in polygynous marriages.

Table 3: Percentage distribution of married women by number of children ever born, by types of union and selected characteristics

Characteristics	Monogamous union N=17,411					Polygynous union N=8,992				
	Total no. of children ever born					Total no. of children ever born				
	None	1-2	3-4	5+	χ^2	None	1-2	3-4	5+	χ^2
Residence										
Urban	8.2	32.6	29.9	29.4	177.270***	3.5	18.8	26.3	51.3	42.618***
Rural	9.8	28.1	24.3	37.9		7.2	18.2	22.9	51.8	
Age										
15-19	47.0	51.3	1.7	†	8721.394***	49.3	48.2	2.5	†	4656.973***
20-29	9.4	48.9	31.6	10.1		6.6	36.2	39.1	18.1	
30-39	3.4	16.2	31.8	48.5		2.5	9.1	22.2	66.2	
40-49	2.2	6.8	18.8	72.2		2.0	5.0	13.5	79.4	
No. of times married										
Once	9.5	30.7	26.7	33.2	208.554***	6.7	18.9	23.9	50.5	29.848***
More than once	4.7	18.1	24.4	52.8		4.7	15.7	22.7	57.0	
Education										
No education	10.5	24.6	22.2	42.7	1119.469***	7.0	17.0	21.6	54.5	182.605
Primary	5.7	21.4	27.1	45.8		4.5	16.7	24.9	53.9	
Secondary +	9.6	38.9	30.2	21.2		5.7	26.3	31.1	37.0	
Husband's education										
No education	11.1	24.5	21.2	43.2	837.159***	6.7	17.0	20.7	55.6	101.864***
Primary	5.7	21.7	27.6	45.1		6.2	17.3	25.5	51.0	
Secondary +	9.2	36.2	29.4	25.2		5.5	21.7	28.0	44.8	
Ideal no. of children										
≤ 4	11.1	44.8	31.4	12.7	1664.124***	8.4	34.6	31.2	25.7	526.668***
5	8.3	33.5	30.4	27.7		7.2	26.3	32.0	34.5	
6 +	8.5	22.5	23.5	45.5		5.9	15.0	21.6	57.5	
Wanted last child										
Wanted then	†	37.9	29.7	32.5	338.703***	†	21.6	27.1	51.3	74.884***
Wanted later	†	38.5	32.0	29.5		†	18.0	28.7	53.3	
Wanted no more	†	2.7	15.3	82.0		†	2.6	6.0	91.4	
Desire for more children										
Wants no more	†	3.6	27.2	69.2	2988.575***	0.2	3.0	17.3	79.5	738.269***
Other	11.5	36.6	26.3	25.6		7.7	21.9	25.2	45.2	
Contraceptive method use										
No method	11.0	30.9	24.3	33.8	511.691***	6.8	18.8	23.2	51.2	83.546***
Traditional	0.6	24.2	38.8	36.4		†	17.5	32.3	50.3	
Modern	0.4	25.3	35.9	38.4		0.2	11.2	28.5	60.1	

Chi-square values are significant at $p<0.05$*, $p<0.01$** and $p<0.001$***; † No. in a cell <1

Multivariate Analysis

The results of logistic regression for all married, monogamous and polygynous unions (represented with Model (I), (II) and (III) respectively) are shown in Table 4. This was adopted to determine the net effect of each explanatory factor on the likelihood of a number of children ever born by married women in each union, controlling the influence of other factors. The results show that with the control of other variables, in all married, monogamous and polygynous unions, age exerts significant influence on number of children ever born. That is, the older the married women, the more likely their number of children ever born (Model I through III). For example, while women aged 40 or more in Model I and II are 33 times more likely to have large number of children ever born than those of age 19 or below, women of 40 years or more in polygynous unions are 25 times more likely to have large number of children ever born than their age 19 or below years' counterparts.

Education of women shows significant negative effect on number of children ever born (Model I and II). The higher the education of women, the less likely they are to have a large number of children ever born as shown in all marriage types (Model 1 through III). Women with secondary education or more have less number of children than those with no education. As a matter of fact, they are 0.6 times less likely to have large number of children ever born than their no education counterparts (Model I and II). Husbands' education also shows similar effects on number of children ever born. The more the education of husbands, the less likely they are to have a large number of children ever born. While husbands with primary education in polygynous unions are 0.7 times less likely to have large number of children ever born than husbands with no education, their counterparts in monogamous unions are 1.4 times more likely to have large number of children ever born than husbands with no education. The effect of work status on number of children ever born is statistically significant after accounting for the influence of other variables (Model I through III). Working married women are about two times more likely to have large number of children ever born than their 'not working' counterparts (Model I through III). Although working women were expected to have a significantly lesser number of children than their 'not working' counterparts, the results suggest otherwise.

The type of marriage women are in does not significantly influence the number of children ever born. The effect of an ideal number of children on the number of children ever born is statistically significant and does not change significantly across the three categories of unions after controlling the influence of other factors. Women with an ideal number of five children are about two times more likely to have large number of children ever born than those with an ideal number of four or less (Model I through III). A similar result is also found in women with an ideal number of 6 or more children (Model II and III). The results show that an ideal number of children of women significantly influences their number of children ever born. The larger the

women's ideal number of children, the larger their number of children ever born.

When the effects of other variables are controlled, contraceptive method used exerts a significant negative effect on number of children ever born. Women with no contraceptive methods are 4 percent less likely to have more number of children ever born than those with modern contraceptive use (Model I and II). Generally, we should have expected the opposite, but the results indicate that the average Nigerian married women does not use contraceptive at the onset of their marriages to control fertility. They adopt it afterwards when they have gotten their desired number of children. The effect of number of times married is in the expected direction but is insignificant. Place of residence is found to exert a significant effect on number of children ever born by women in all married unions. Women in rural areas are more likely to have higher number of children ever born than their counterparts in urban settings (Model I through III). This result is instructive as one should expect women in the urban area to have significantly less number of children ever born than those in the rural area. With a further disintegration of data, Model III shows a significant effect which indicates that women in the rural area are 0.7 times more likely to have high number of children ever born than urban married women.

The inclusion of husband's desire for children and ethnicity in Model II further enhance the explanatory power of the independent variables. Husbands' desire for children is statistically significant. Women who do not know whether their husbands desire for more children or not are 0.8 and 0.7 times (in monogamous and polygynous unions respectively) less likely to have high number of children ever born than those who together with their husbands both want children (Model II and III). Effect of ethnicity on number of children ever born is statistically significant. Yoruba are 2 times in monogamous unions and 3 times in polygynous unions more likely to have high number of children ever born than their Hausa counterparts (Model II and III). The Igbo ethnic group shows a significant negative effect on high number of children ever born. Igbo are 0.8 times less likely to have high number of children ever born than Hausa married women.

Table 4: Odds ratio for married women logistic regression models showing number of children ever born by all women, types of union and selected characteristics

Characteristics	Model		
	(I) All married unions	(II) Monogamous union	(III) Polygynous union
	Odds ratio	Odds ratio	Odds ratio
Current Age			
≤19(ref)	1.00	1.00	1.00
20-29	10.284***	9.884***	10.889***
30-39	25.233***	24.097***	21.964***
40+	33.088***	33.607***	24.772***
Education			
None(ref)	1.00	1.00	1.00
Primary	1.175	1.080	1.275
Secondary+	0.612***	0.604***	0.735
Husband's education			
None(ref)	1.00	1.00	1.00
Primary	1.105	1.400**	0.728*
Secondary+	0.923	1.006	0.360
Work status			
Not working(ref)	1.00	1.00	1.00
Working	1.536***	1.422***	1.716***
Types of marriage			
Monogamous(ref)	1.00		
Polygynous	1.100		
Ideal no. of children			
≤ 4	1.00	1.00	1.00
5	1.593***	1.736***	1.547*
6+		1.991***	2.080***
Contraceptive method use			
No method	0.044***	0.042***	0.000
Traditional	0.823	0.801	1.083
Modern(ref)	1.00	1.00	1.00
No. of times married			
Once(ref)	1.00	1.00	1.00
More than once	0.993	1.119	1.098
Residence			
Urban(ref)	1.00	1.00	1.00
Rural	1.126*	1.262	0.740*
Husband's desire for children			
Both want same(ref)		1.00	1.00
Husband wants more		1.150	0.828
Husband wants fewer		1.058	0.855
Don't know		0.849*	0.676*
Ethnicity			
Hausa(ref)		1.00	1.00
Yoruba		1.523**	2.825**
Igbo		0.766*	1.299
Other		1.042	1.054
Number of wives			
1(ref)			1.00
2+			1.014
Rank among wives			

1st(ref)			1.00
2nd			0.433***
3rd+			0.297***
Model chi-square	3551.267***	2568.719***	1083.520***
Nagelkerke R Square	0.295	0.304	0.315
-2 Log Likelihood	11174.199	7945.798	2968.989

Significant at p<0.05*, p<0.01**, p<0.001***, ref - reference category

Number of wives and rank among wives were further included in Model III to additionally improve the explanatory power of the independent variables. The analysis reveals no significant difference between numbers of wives in polygynous unions with respect to number of children ever born. Rank among wives shows a significant negative effect on number of children ever born after controlling for other factors (Model III). The number of children ever born decreases as wives ranking increases. While 2nd rank wives are 0.4 times less likely to have more number of children ever born than 1st rank wives, 3rd or more ranks wives are 0.3 times less likely to have more number of children ever born than 1st rank wives.

Discussion

The study found that the relationship between polygyny and fertility is a complex one. It establishes that the determinants of polygyny-fertility are predominantly within the social context, shaped by actors' interactions and calculus of rationality. While the logistic regression shows no significant support of the traditional polygyny-fertility hypothesis that polygynously married women are less fertile than monogamously married women, the results further reveal that women in polygynous unions who do not rank first have lower fertility than women in monogamous unions. This indicates that the traditional polygyny-fertility hypothesis should be reviewed or recast because adequate conclusions may not be arrived at after comparing both groups (monogamously married women and polygynyly married women) without including rank among wives in the discourse.

In all marital unions, the study found that age of women is the most significant factor determining fertility. Older married women are found to have a larger number of children ever born than younger married women. This finding corroborates Nwokocha's (2012) position that marriage and pregnancy at early ages imply high fertility. Education of women shows a significant negative effect on number of children ever born. The study found that women with more education have lower fertility than women with less education in all marital unions. Specifically, the study found that married women with secondary education or more have lesser number of children ever born than those with primary or no education. This supports the assertion of Michael and Odeyemi (2017) that education of women is key to reducing fertility in Nigeria.

Husband's education is found to have significant effect on fertility as with their wives. Particularly, husbands with primary education in polygynous unions are found to be less likely to have large number of children ever born than husbands with no education. This suggests that husbands play a pivotal role in their wives fertility. This finding corroborates the observation by Isiugo-Abanihe (2003) that husbands are key decision makers on reproductive health issues. The study also found that work status has a significant effect on the fertility of married women. It reveals that working married women are about two times more likely to have higher fertility than their non-working counterparts. This finding is unexpected. Ordinarily, we should have expected working women to have a significantly lesser number of children ever born than their non-working counterparts but the result suggest otherwise. However, for clarity on this very finding, a proper investigation on the occupation of working women will explain this result better. The women's occupation will explain the nature of their work.

The study found that an ideal number of children for married women have a significant effect on fertility across all marital unions. It shows that the higher the women's ideal numbers of children, the higher their fertility. The study reveals another important issue. It found that contraceptive method used has significant negative effects on the fertility of married women. It shows that married women with no contraceptive method are less likely to have higher fertility than those with modern contraceptive methods. Generally, the opposite was expected. However, to explain this, the results indicate that average Nigerian married women do not use contraceptive from the onset of their marriage to control fertility. They adopt it afterward when they have gotten their desired number of children (Michael and Scent, 2017).

The study also found that the number of times of marriage has no significant effect the on the fertility of married women. This finding is inconsistent with the observation of Ahmed (1985) that women who are married more than once have lower fertility than those who are married once. The place of residence is found to have a significant effect on the fertility of married women in both monogamous and polygynous unions. Women in rural areas are found to have higher fertility than their urban counterparts. This very finding occurs as expected. The husbands' desire for children is found to be statistically significant. The study particularly reveals that women who do not know that their husband desire for more children in both monogamous and polygynous unions are less likely to have higher fertility than those who are aware. This suggests that women tend to play along with their husband's desire on issues that concern fertility or number of children in as much as they are fecund. This slightly supports the study of Blanc and Gage (2000) that the main reason men marry more wives is to have children. However, since fertility is significantly lower among those women who are not aware that their husbands desire more children, it indicates that some men become polygynists mainly to satisfy their sexual urge and not mainly to have many children.

The study found that ethnicity has a significant effect on fertility. For instance, the study found that Yoruba married women have higher fertility than their Hausa counterparts. This finding is unexpected. The Hausas are expected to have higher fertility than the Yoruba considering the high nature of early/child marriage among the Hausas (Allen and Adekola, 2017) and a total fertility rate (TFR) of 4.6 among the South West Nigeria (a region mainly inhabited by the Yoruba), which is relatively lower than the TFR of northern regions of Nigeria (NPC and ICF International, 2014). Notwithstanding, this result can be explained. Children are highly valued among the Yoruba especially within marital unions. For the fact that the study is conducted among married women, we may deduce this evidence from the data. To further buttress this finding, we should also note that the Yoruba are known for spending a great part of their earnings on the naming ceremony of their children (Odesanya, Sunday and Akinjogbin, 2017). The wealth of men in this ethnic group is displayed during naming ceremonies. The Yoruba culture encourages married women to bear children as soon as possible after marriages have been contracted and consummated (preferably within the very first year of marriage). The importance of children among the Yoruba is found in their names: Taiwo and Kehinde (names used to call all twins, regardless of gender) and Iya ibeji (meaning mother of twins – name used to address nearly all pregnant women in Yoruba culture) (Okafor, 2013). For the fact that births within this ethnic group are highly celebrated notwithstanding the number of children ever born by a woman and her fertility potential, this finding is supportive of high fertility among women of polygynous unions in Yoruba ethnic group.

The study also found that Igbo married women have lower fertility than their Hausa counterparts. This is expected because the Igbo marry late compared to other ethnic groups in Nigeria. As a matter of fact, the Igbo men are known for achieving financial stability before marriage. The study further found that there is no significant difference between the number of wives in polygynous union with respect to the number of children ever born. Rank among wives in the study shows a significant negative effect on fertility. The study reveals that the fertility of women decreases as the ranking of wives increase when the influences of other factors were further controlled. It shows 2nd rank wives to have lower fertility than 1st rank wives, and 3rd or more ranks wives to have lower fertility than 1st rank wives. This supports the assertion of Bean and Mineau (1986) that the fertility of the first wife in a polygynous union is usually high.

Conclusion

As shown in our findings, it is difficult to disagree with the traditional polygyny-fertility hypothesis which postulates that women in polygynous unions have lower fertility than those in monogamous unions. We suggest that differences in previous findings could have arisen from datasets, methodological differences, period and/or locale of study. We further argue

that there is no significant difference between the fertility of women with respect to number of unions entered or number of times married. The reason has been that a monogamous wife is a potential polygynous wife and vice versa. A woman may leave a particular union to remarry and her fertility history remains intact. We assert that there is a significant difference between the fertility of married polygynous women with respect to marital ranking among wives. The later wives are more likely to have lower fertility than earlier wives or first wives. This study's findings reflect the polygyny fertility context of Nigeria and may further mirror the situation of other countries in sub-Saharan Africa.

Acknowledgement
We are grateful to the Demographic and Health Survey Program for making available the 2013 Nigeria Demographic and Health Survey dataset and for granting us the permission to use it for this study.

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