

Polygyny and fertility: Continuity or change in sub-Saharan Africa

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Introduction

Over the past half century, many developing countries, particularly in Asia and Latin America, have experienced substantial declines in fertility. Sub-Saharan African countries, in contrast, continue to have some of the highest rates of fertility in the world (Bongaarts and Casterline 2013). Yet, many African countries have begun their fertility transition, albeit much later and at a slower pace compared to other parts of the world (Bongaarts 2017; Bongaarts et al. 2013). At the same time, Sub-Saharan Africa has been undergoing major transformations to the institution of marriage, including increases in age at first marriage (Bongaarts et al. 2017; Mensch 2005), individual spousal selection (Loforte 2000; Meekers 1995; Smith 2001), and informalization of marriage (Anderson 2007; Bishai and Grossbard 2010; Chae et al. 2020). Polygyny, a widespread traditional practice that predates the spread of Christianity and Islam and is practiced across ethnic and religious lines (Goldman and Pebley 1989; Lesthaeghe, Kaufmann, and Meekers 1989), also appears to be declining across the subcontinent (Chae and Agadjanian 2019; Fenske 2015).

Scholars have long observed a strong connection between polygyny and fertility. In the African context, men often married more than one woman to ensure that enough progeny were produced to continue their lineage (Klomegah 1997; Muhsam 1956). Research on the link between polygyny and fertility has been conducted in multiple contexts and has typically revolved around the polygyny-fertility hypothesis, which holds that fertility is lower among women in polygynous unions than their counterparts in monogamous unions (Bean and Mineau 1986; Garenne and Van de Walle 1989; Muhsam 1956). Several reasons for this disparity are frequently cited, including reduced coital frequency and greater infertility, due to the older ages of polygynous husbands (Bean et al. 1986; Garenne et al. 1989; Muhsam 1956). Past research has also shown differences in fertility by wife's rank, although the results have not always been consistent, particularly relative to women in monogamous unions (Muhsam 1956).

Much of the previous research on polygyny and fertility in sub-Saharan Africa was conducted over two decades ago in a context of persistent high fertility. Moreover, mainly due to data limitations, most of this research was country-specific and often narrowly focused on particular ethnic groups or subregions. Therefore, in an era of dramatic societal shifts, when both polygyny and fertility are declining, it is unknown whether these earlier observed relationships are reflected at the country-level and across multiple contexts. Our study revisits the polygyny-fertility relationship in a cross-country analysis of 21 sub-Saharan countries undergoing varying levels of polygyny and fertility decline. We test whether the polygyny-fertility hypothesis still holds in the current context and examine whether and how the polygyny-fertility relationship has changed over time. Findings from this study can provide insight into the complex dynamics of marital and family life in a rapidly changing context of the sub-continent.

Data and Methods

We use data from the Demographic and Health Surveys (DHS) to revisit the relationship between polygyny and fertility in sub-Saharan Africa. The DHS are cross-sectional, nationally representative household-level surveys that are conducted approximately every five years in many developing countries across the world. The use of standard sampling procedures and instruments make the DHS data an extremely valuable resource for cross-country comparisons. Our study focuses on reproductive-age women in 21 countries that have collected at least two rounds of data spanning 10

years or more on key measures of interest, including polygyny status of marriage, wife's rank within polygynous unions, and spousal characteristics. These 21 countries, which make up 66% of the sub-continent's population, represent all regions of Sub-Saharan Africa (UNFPA 2020).

Dependent variables

Our study examines two different aspects of fertility: actual and ideal fertility. Actual fertility is measured by the total number of children ever born to a respondent, while ideal fertility is represented by the ideal number of children a woman would have liked to have in her whole life, regardless of her actual childbearing experience. While most women provided a numeric response to this question, a non-trivial proportion of women gave a non-numeric response, such as 'don't know' or 'it's up to God', though the prevalence of non-numeric responses has been declining (Frye and Bachan 2017). Women who gave a non-numeric response are excluded from analyses of ideal fertility.¹

Independent variables

Our analysis focuses on two key predictor variables related to polygyny. The first variable measures whether women are in a polygynous union. Our second measure of polygyny captures a woman's rank within her marriage – senior or junior. Women in polygynous unions were asked the following question: '*Are you the first, second, ... wife?*'. Women who reported being the first wife are coded as being the senior wife. Otherwise, they are coded as being the junior wife. Because the distinction between senior versus junior wife is the most consequential for their status and relatively few women in polygynous unions are third or higher-order wives, we limit wife's rank to these two categories.

Our analyses adjust for variables that could be associated with actual or ideal fertility. These variables include sociodemographic characteristics such as age, educational attainment, household wealth category, and urban residence. Depending on the availability of country-specific data, we also control for ethnicity, religion (Muslim, Christian, other), and region. Furthermore, we include marital and spousal characteristics, such as previous marriage (previously married vs. not), spousal age difference², and spousal education difference, in our models. In models of ideal fertility, we adjust for number of children ever born because it is known to influence women's answers to questions about how many children they would have liked to have (McCallister et al. 2012). Finally, we include a control for survey year.

Analytic strategy

We use ordinary least squares (OLS) regression to model number of children ever born and ideal number of children. We build separate models of data pooled across multiple survey waves. For each outcome, we fit two sets of models, the first with polygyny vs. monogamy status as the primary predictor variable, and the second where women in polygynous unions are disaggregated by wife's rank. Lastly, to test whether the polygyny-fertility relationship has changed over time, we include interaction terms between polygyny measures and survey year. All regression models include the

¹ Considerable variation existed in the percentage of women in the analytic sample who provided a non-numeric response, ranging from 0.14% in Benin 2011 to 26.27% in Burkina Faso 1993. On average, across all country-year combinations, 9.3% of women offered a non-numeric response. In the earliest and most recent survey rounds, these percentages were 11.3% and 7.0%, respectively.

² Not all surveys collected information on husband's age, particularly in the early to mid-1990s. Thus, this information is not available for the following survey-year combinations: Burkina Faso 1993, Cameroon 1991, Ghana 1993, Malawi 1992, Niger 1992, Rwanda 1992, Senegal 1992, Tanzania 1991 & 1996, and Uganda 1995.

control variables listed above. Because the DHS did not collect data on spousal age difference in earlier survey rounds, we exclude these rounds from the pooled regression analyses.³

Preliminary Results

In Fig. 1, we obtained inconsistent findings regarding the relationship between polygyny and actual fertility. Where the relationship is statistically significant, we found mostly a negative association: polygyny is associated with fewer children ever born. Only in Nigeria and Zimbabwe did we observe a significantly positive association. Next, we ran similar models while considering wife's rank in polygynous unions (Fig. 2). In most countries, senior wives in polygynous unions have significantly more children than monogamous women, while junior wives have significantly fewer. Senior wives also have significantly higher fertility than junior wives, net of other factors.

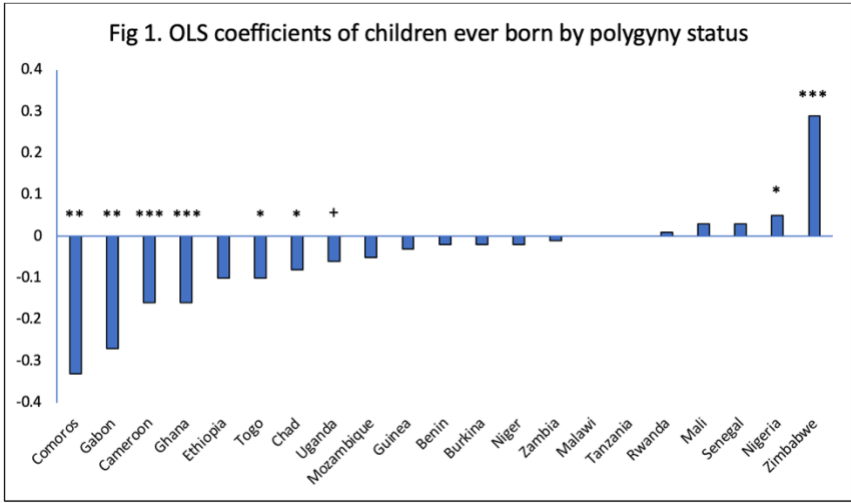
Similar to actual fertility, we observed inconsistent associations in the relationship between polygyny and ideal fertility (Fig. 3). In almost all countries where a significant relationship was found, women in polygynous unions reported a higher ideal number of children than monogamous women. When we considered wife's rank in models of ideal fertility, we generally found that senior wives in polygynous unions reported a higher ideal number of children than women in monogamous unions (Fig. 4). In contrast to actual fertility, where junior wives had significantly lower fertility than women in monogamous unions, we found relatively few significant net differences in ideal fertility between these two categories of women. In more than half the countries, senior wives reported higher ideal fertility than junior wives.

Finally, we included interaction terms between polygyny and survey year to examine whether the relationship between polygyny and fertility changed over time. In approximately half the countries in our sample, we observed little to no change in the relationship between polygyny and actual fertility over time (not shown). In countries where the interaction term was statistically significant, the direction of the relationship varied. In contrast to actual fertility, only a handful of countries experienced any change in the relationship between polygyny and ideal number of children (not shown). In most countries, this relationship did not vary over time.

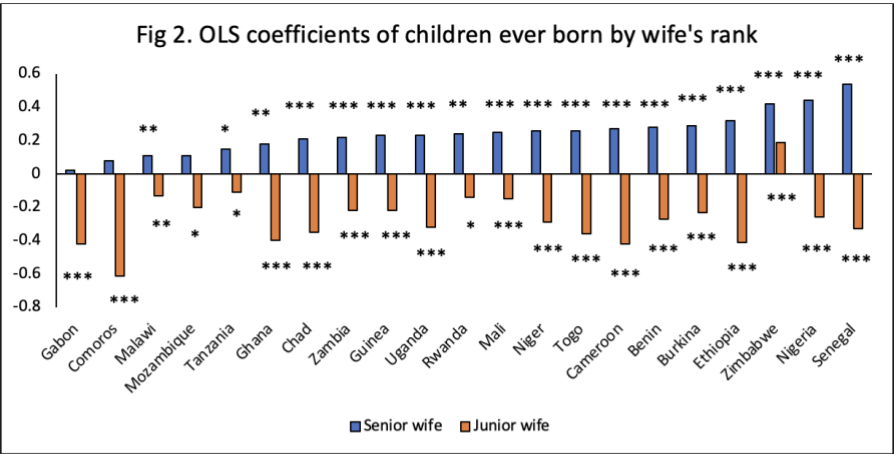
Discussion and Next Steps

Our current analyses provide new insight on the polygyny-fertility relationship in sub-Saharan Africa in a contemporary context of polygyny and fertility decline. Women in polygynous unions, regardless of wife's rank, have higher actual and ideal fertility compared to women in monogamous unions (not shown). After controlling for sociodemographic, marriage, and husband characteristics in regression models, we observed inconsistencies in these relationships. Where these relationships are statistically significant, women in polygynous unions generally had lower actual fertility, but higher ideal fertility. When disaggregated by wife's rank, we obtained a more consistent picture: Net of other factors, senior wives have higher fertility, both actual and ideal, than junior wives (and women in monogamous unions). Junior wives, in contrast, have lower actual fertility, but similar levels of ideal fertility, compared to women in monogamous unions. Over time, the polygyny-fertility relationship remained relatively constant, with little variation, for most countries in our analysis. Where change was observed, it was mainly in actual fertility with no consistent pattern across the sample. In the completed paper, we will further investigate these fertility differentials and explore potential mechanisms underlying these relationships. We will also consider whether other aspects of fertility, including desire to have another child and desired timing of next birth, vary by polygyny status and wife's rank. Finally, we will investigate potential causes of the cross-country variation observed and examine whether the polygyny-fertility relationship varies by pace of polygyny and fertility decline.

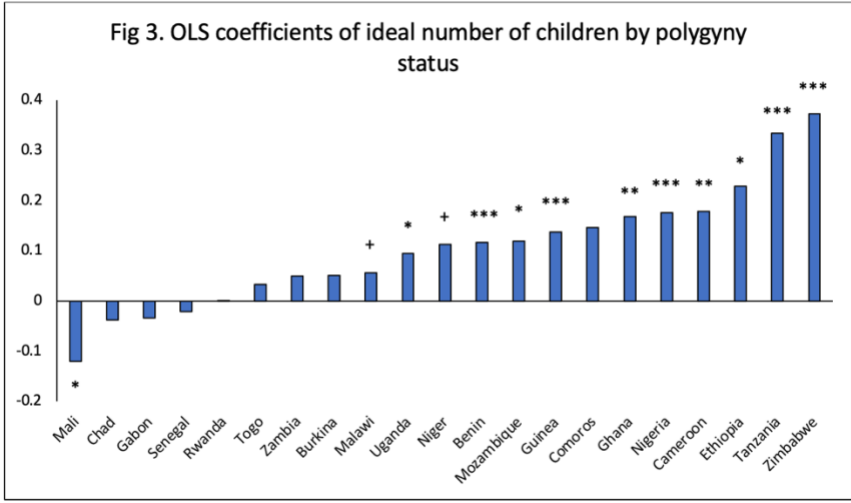
³ Data from these survey rounds, however, were included in descriptive statistics.



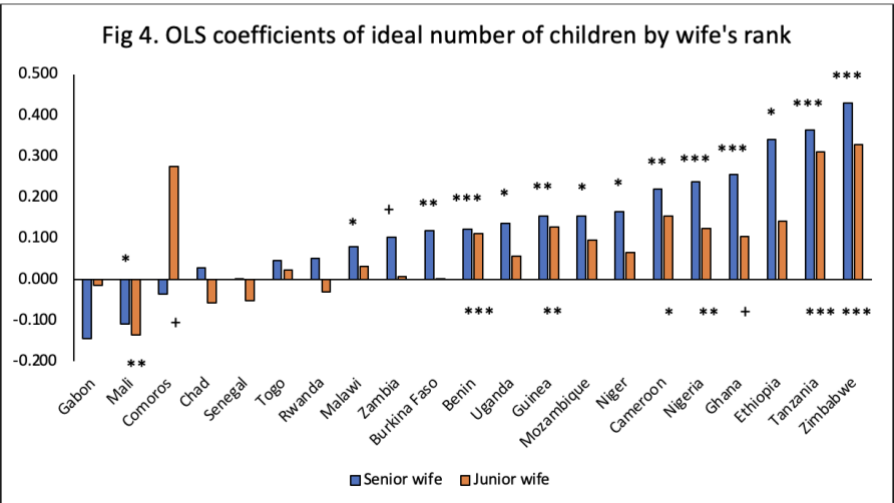
Note: Reference category = monogamous union. Significance levels: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001.



Note: Reference category = monogamous union. Significance levels for senior wives and junior wives are shown above and below the x-axis, respectively. In all countries, the coefficients of senior wife and junior wife are statistically different from each other. Significance levels: * p<0.05; ** p<0.01; *** p<0.001.



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Note: Reference category = monogamous union. Significance levels for senior wives and junior wives are shown above and below the x-axis, respectively. In all countries except Ethiopia, Gabon, Mozambique, Togo, Zambia, Comoros, Malawi, and Niger, the coefficients of senior wife and junior wife are statistically different from each other. Significance levels: + p<0.10; * p<0.05; ** p<0.01; *** p<0.001.

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