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# Why Would She? Polygyny and Women's Welfare in Ghana

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**Abstract:** Polygyny is still widely practiced in much of sub-Saharan Africa. There is a wide range of opinions among scholars concerning whether such relationships are beneficial to women. While some claim that women benefit from such marriages in terms of higher consumption or leisure time, others believe that women enter such relationships because they are oppressed. We use data on households from Ghana to examine whether women benefit from polygyny and if they are more or less 'oppressed' than monogamous women. We find little evidence to support the view that women experience economic benefits from these unions. Polygynous women in Ghana tend to be more accepting of domestic violence, experience more domestic violence, and have less decision-making power within the household than their monogamous counterparts. Thus there seems to be more evidence to support the view of polygyny as an oppressive institution rather than the outcome of a woman's rational choice.

**Research Note**


Polygyny is widely practiced in much of sub-Saharan Africa. There is a wide range of opinions among scholars concerning whether or not such relationships are beneficial to women. While some claim that women benefit from polygynous marriages in the form of higher consumption or leisure time, others believe that the women who enter such relationships do so because they are oppressed. This paper investigates the evidence in support of three hypotheses which try to explain why a woman might choose to enter into a polygynous marriage.

We use data from two different nationally representative surveys on households from Ghana to examine whether women benefit from polygynous marriages and whether they appear to be more or less 'oppressed' than women in monogamous marriages. First, we explored whether women who enter into polygynous marriages enjoy higher consumption than women in monogamous marriages. None of the regression models we used supported this hypothesis. Next, we checked to see whether co-wives in polygynous marriages enjoy more leisure time as a result of being able to share tasks in the household. We found no support for this hypothesis in the data. Finally, we investigated whether women in polygynous marriages are more oppressed than their monogamous counterparts by looking at both perceptions and experiences of domestic violence and power

over household decision-making.  We found that polygynous women are more likely than monogamous women to experience domestic violence as well as believe it is acceptable in some instances.  In addition, they are also more likely to come from households in which their mothers experienced domestic violence. Moreover, polygynous wives are less likely to have decision-making power regarding their own health and large household purchases. However, they do have some control over their own earnings.

We find that there is no empirical support for the view that women benefit from polygynous marriages either in terms of higher consumption or in saving labor time in Ghana. Thus overall, it seems that there is little reason to believe that polygyny is beneficial for women in Ghana.  This does not automatically mean, however, that eliminating polygyny will immediately benefit women. Polygyny is one institution among many and embedded in a social and cultural context of gender norms and behaviors many of which are detrimental to women's autonomy: large spousal age gaps, differences in access to education, differences in access to productive resources are all part of this context.  The direction of causality between polygyny and other facets of women's oppression is unlikely to be linear.  If our interpretation of the data is correct, then women who come from households where they are less

empowered are more likely to end up in polygynous marriages. Once in those marriages, they are more likely to experience domestic violence and have less decision-making power than their monogamous counterparts.  Thus the direction between 'oppression' and polygyny is not uni-directional and it would therefore be naïve to think that eliminating this institution would end women's oppression. Based on the evidence presented here, it does not seem likely that efforts to eliminate the practice will cause women harm.

**Why Would She? Polygyny and Women's Welfare in Ghana**

## I.        Introduction

Polygyny[1] is widely practiced in much of sub-Saharan Africa.  The conventional wisdom among social scientists after the colonial era was that polygyny would disappear as African societies modernized and changed their legal codes (Goode 1970; Ware 1979; Koktvedgaard Zeitzen 2008).  However, this did not occur.  In West Africa, in particular, the incidence of polygyny is still very high with 40-50% of married women in polygynous unions in several countries (DHS 2009).

The diversity of views among scholars on the practice of polygyny is remarkably wide. While some view polygyny as beneficial towards the men and women who enter into such relationships (Grossbard 1980; Becker 1991; Wright 1994), others view it as a sign of women's oppression and a cause of underdevelopment (Bergmann 1995; Meekers and Franklin 1995; Tertilt 2005). In this paper, we examine the evidence in support of three different hypotheses proposed in the economic and anthropological literatures for why a woman might enter into a polygynous union.

The answer to this question may have important policy implications since some scholars and activists have recommended banning the practice either to improve women's social position or to remove an obstacle toward development (Tertilt 2005; Gould et al. 2008).  The United Nation's Committee on the Elimination of Discrimination against Women (http://www.un.org/womenwatch/daw/cedaw/recommendations/recomm.htm) states that polygamy 'violates the constitutional rights of women' and breaches the Convention on the Elimination of all forms of Discrimination again Women.  The Committee lists polygamy as a

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[1] Polygamy is the general term used for a marriage in which either a man or a woman has more than one spouse. Polygyny is the specific form of polygamy in which a man has more than one wife.

'harmful traditional practice' along with female circumcision and marital rape (Article 12(1).18) and advocates its total prohibition (Article 16(2).39). If the evidence is found to support the view that polygyny is indeed beneficial towards women, such a policy could have negative unintended consequences on women's well-being.

There is a rich literature which examines polygyny from an evolutionary anthropological perspective (Strassman 1997; Ember et al., 2007 Gibson and Mace, 2007; Strassman 2011). This research explores why the practice evolved and persists in human societies and its implications for society and women and children in particular. In this paper, we take a microeconomic perspective by trying to understand the practice and its implications by investigating the motivation for individuals to enter into such a union.

Most of the microeconomics literature on polygyny examines the rationality of this choice from a man's perspective (Boserup 1970; Jacoby 1995; Kazianga and Klonner 2006; Gould et al. 2008). In this paper, we use data on households from Ghana to examine whether women benefit from polygynous marriages and whether they appear to be more or less 'oppressed' than women in monogamous marriages.

Ghana is a 'moderately' polygynous society by West African standards with about 20% of married women in polygynous marriages (Ghana Statistical Service, 2009). We use data from both the 2005/6 Ghanaian Living Standards Measurement Survey V (GLSS V) and from the 2008 Ghanaian Demographic Health Survey. While both datasets are from household surveys and have information on household characteristics, the GLSS has information on expenditures and time use, while the DHS has information on social attitudes and beliefs.

We find that there is no empirical support for the view that women benefit from polygynous marriages either in terms of higher consumption or in saving labor time in Ghana. We find that women in polygynous marriages tend to experience more domestic violence and

tend to be more accepting of domestic violence. They also have less control over decisions regarding their own health and large household purchases compared with women in monogamous marriages. Thus overall, it seems that there is little reason to believe that polygyny is beneficial for women in Ghana.

## II. Women's Welfare and Polygyny: Three Hypotheses

### A. Higher Consumption under Polygyny?

Boserup (1970) is the first modern economist to analyze the practice of polygyny. She attributes the widespread existence of polygyny in sub-Saharan Africa to the central role of female agricultural labor in the region. She argues that because women in most of sub-Saharan Africa are so important in agricultural production, "…a man with several wives commands more land, can produce more food for his household and can achieve a high status due to the wealth which he can command (Boserup 1970, p.37)." Becker (1974) in a sense reverses the direction of causality in Boserup's explanation for polygyny and attributes its occurrence in some societies to the existence of wealth inequality. He posits that inequality in wealth makes some men more productive than others resulting in a situation where a more productive man is able to generate more productivity from a second wife than another man might from one wife. Grossbard (1976) uses data from Nigeria to empirically test the Boserup/Becker hypothesis and finds that wealthier men indeed have more wives. Jacoby (1995) uses household survey data from Côte d'Ivoire to estimate 'the demand for wives' and explicitly deals with the endogeneity issue.[2] He finds that not only do wealthier men have more wives, but that conditional on wealth, men with more productive farms have more wives.

But what does all of this imply for women? Becker argues that polygyny is rational and efficient in the context of wealth inequality among men and that "...women tend to gain from

polygyny" (Becker 1991, 81).  The implication is that a woman might choose to be a second wife

of a wealthy man because she would be more productive in that relationship. Jacoby (1995)

similarly concludes from his empirical analysis that "...wives are attracted to husbands on whose

farms their labor is more productive" (Jacoby 1995, 965).  Grossbard (1978) argues that women

under polygyny benefit from the increased competition for their services which drives up bride

[2] Jacoby (1995) uses cluster-level crop shares as an instrument for wealth in a two-stage least square regression.

prices. Thus women do better in the 'marriage market' under polygyny since it increases men's competition for wives. A key implicit assumption made by those arguing that women gain from their increased productivity (or their higher bride prices) is that they capture at least part of the benefits through greater consumption. We, therefore, refer to this hypothesis as the 'consumption' hypothesis.

### B. Labor Sharing and Polygny

Another hypothesis put forth by some anthropologists is that in societies where there is a large labor burden for women, being part of a polygynous household enables them to share the burden of the work (Brown 1981; Urdang 1989). Steady (1987) argues that women in polygynous marriages benefit from sharing in childcare activities; in the context of sub-Saharan Africa where fertility rates are high, this can involve substantial amounts of time. In a study done among the Yoruba of Nigeria, Ware (1979) found that a majority of women surveyed said they would be pleased if their husbands took another wife "…to share the housework, husband care and child-minding…." (Ware 1979, 188). In a more recent survey examining changes in attitudes towards polygyny among the Yoruba, Aluko and Aransiola (2003) report that some monogamous women stated that an advantage of polygyny is that "…co-wives serve as helpers in the family, most especially in the household duties." (Aluko and Aransiola 2003, 182).

Lubkemann (2000) claims that in the Machaze region of Mozambique, although co-wives were seen as potential rivals, they were also seen to bring a benefit in helping to alleviate the heavy labor requirements associated with water scarcity. Anderson (2000) finds that women in her study in South Africa claim that help from a co-wife in household duties was a significant factor in their decision to enter into a polygynous marriage.

We refer to this second hypothesis as the 'labor-sharing' hypothesis. If the first hypothesis presumes that polygyny ultimately benefits women through an increase in their consumption, the second emphasizes that the benefit would occur through an increase in leisure time. Both of these hypotheses share the idea that polygyny is beneficial for women.

### C. Oppression of Women and Polygny

There is a third view, however, that sees polygyny as a manifestation of the oppression of women. Bergmann (1995) argues that in societies that allow polygyny, "....women tend to have abysmal status, no opportunities for development of talents, no freedom to choose mates, no ability to escape onerous marriages....In such societies women are virtual prisoners; men totally monopolize all the power, freedom, fun and games."(Bergmann 1995, 145) Meekers and Franklin (1995) find evidence that women in polygynous unions in Tanzania tend to have negative attitudes about their marriages. Using data from interviews of Kaguru women in Tanzania, they find that women in polygynous households have to compete for scarce resources, particularly for their children and live in conflict with their co-wives. Aluko and Aransiola (2003) in a survey among the Yoruba of Nigeria, find that about 81% of those surveyed (including men) found that polygyny offers no particular advantage to women. Jankowiak et al. (2005) in a cross-national study of polygynous societies find evidence of pervasive co-wife conflict and hostility and conclude that polygyny is a 'less satisfying' marital system for women than monogamy. If this is the case, then a natural question that arises is why women would agree to enter into such relationships. Implicit in the view of polygyny as oppressive towards women, is the idea that women may not actually choose to enter into polygynous unions of their own free will.

There is a strong correlation between high polygyny rates and the payment of bride prices (Tertilt 2005). Tertilt (2005) argues that men in polygynous cultures make the fertility and marriage arrangements for their daughters due to an asymmetry between the sexes. Thus fathers, in effect, 'sell' their daughters to receive high bride-prices according to this perspective. If this is the case, then it is no longer meaningful to ask why a woman might choose to enter into a polygynous union since it might not really be her choice. If this is the case, it is perfectly possible for women to end up in polygynous marriages that make them worse off as argued by the scholars cited above. We refer to this third hypothesis as the 'oppression' hypothesis.

### D. Method: Running a 'horse race'

The different hypotheses have different testable implications. If the 'consumption' hypothesis is correct, then we should observe 'similar' women who are in a polygynous union should have higher average consumption compared with those in monogamous unions. We use the GLSS V dataset to compare average expenditures per person for monogamous and polygynous households. It would be preferable to use information on individual expenditures, but these are not available. Average expenditures per person should, in any case, give a lower bound estimate of women's consumption if there is inequality in distribution in the household. We address potential selection complications using several different methods which are discussed in detail below in section IV.

If the 'labor-sharing' view is correct, then wives of polygynous men should exhibit less time spent on labor activities than wives in monogamous marriages (controlling for other differences). The GLSS V is one of the few living standards measurement surveys to have a time use module which contains detailed information on hours worked both inside and outside of the home. We exploit this feature of the data to compare hours worked among women in polygynous and monogamous unions and again address potential endogeneity concerns using

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several different methods.

And finally, if the view of polygyny as an oppressive institution for women is accurate, then we should observe that women in polygynous marriages are less empowered than those in monogamous marriages. We use data on domestic violence and household decision making power from the 2008 Demographic and Health Survey dataset for Ghana to test the 'oppression' hypothesis. We investigate whether women in polygynous marriages are more likely to experience domestic violence and whether they are more likely to find it acceptable than women in monogamous marriages. We also examine the relationship between the type of marriage and a woman's decision-making power in the household.

**III. Data and Descriptive Statistics**

We use data from two different household survey datasets in our analysis: the Ghanaian Living Standards Survey V (GLSSV) and the 2008 Ghana Demographic and Health Survey (DHS). The GLSS V is a nationally representative household survey conducted by the Ghana Statistical Service between 2005 and 2006 that contains detailed information on various topics including demographic characteristics, household income and expenditures, education, and employment and time use. We use data on 3935 married women who are either in monogamous or polygynous marriages and who were between 15 and 49 years old at the time of the survey.[3]. The Demographic Health Surveys are nationally representative household surveys developed by the United States Agency for International Development that collect data on health and fertility in many developing countries. As part of these surveys, female respondents are asked detailed questions relating to their pregnancies, health of their children, education, household characteristics, and beliefs and attitudes. In this study we use the 2008 DHS from Ghana which included information on 2,006 women from the age of 15 to 59. The 2008 Ghana DHS also included a domestic violence module administered to about half of the female respondents.

Table 1 presents descriptive statistics for the variables used in this study from the GLSS and DHS datasets. Both surveys have similar rates of polygyny among married women with 18% of married women in polygynous marriages in the GLSS sample and about 20% in the DHS dataset. While characteristics across the surveys are similar, there is a big difference in education with the percentage having primary and secondary education substantially higher in the DHS compared with the GLSS for both women and their husbands.

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[3] We restrict the sample for the GLSS dataset so that the ages of women match those in the DHS dataset.

(Table 1 HERE)


Before beginning our analysis, we first examine overall differences between wives in polygynous unions and monogamous women by running simple probit regressions using a dummy for polygynous marriage on various characteristics with standard errors clustered at the survey cluster level for each dataset.  Results are reported below in Table 2.  There are no statistically significant differences in age, age at marriage, or primary education between women in polygynous and  monogamous unions. Women who are have a secondary education (in the DHS sample) and whose husbands have a primary education (in both samples) are less likely to be in polygynous marriages.  While the GLSS dataset has information on expenditures, the DHS only ask households about asset ownership. The DHS then uses this information to create a wealth index using principal component analysis.  The index includes ownership of selected assets as well as the types of water access, sanitation facilities, electricity, presence of a domestic servant, and housing construction materials (Rutstein and Johnson 2004).

Women in polygynous  marriages are not more likely to enjoy higher expenditures or greater wealth compared to  monogamous women.  Women from matrilineal lineages are less likely to be in polygynous  marriages.. Women in urban areas are less likely to be in polygynous relationships in the GLSS sample, but the coefficient is not statistically significant in the DHS sample.  This may be driven by collinearity between the urban dummy and the wealth index (the correlation between the two is 0.70).  The baseline category for religion is 'no religion' in both samples; the DHS sample shows that Catholics and 'other Christians' have a lower probability of being in a polygynous marriage, while in the GLSS sample, the results show that Muslims and those who identify as having a 'traditional African' religion are more likely to be in

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polygynous marriages then those who identify as having 'no religion'.

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[4] In the GLSS sample, women with primary education are less likely to be in polygynous marriages, while in the DHS sample, it is secondary education that appears to make the difference.

(Table 2 HERE)

## IV. Empirical Analysis

### A. *Consumption Hypothesis*

In order to further examine further the implications of the 'consumption' hypothesis, we investigate whether average expenditures for women in polygynous households is higher than in monogamous households. Since it is quite possible that there may be unobserved characteristics of women that would affect both their selection into a particular type of marriage and the outcomes of interest, OLS coefficients may be biased. We address this concern by using three different methods: instrumental variable (IV) regression, a control function regression, and propensity score matching (PSM). We estimate the following basic model:

$$Y = \alpha + \beta Poly + \gamma X + \delta R + \varepsilon \qquad (1)$$

where $Y$ represents average expenditures per household, $Poly$ is a dummy indicating whether the woman is in a polygnous marriage, and $X$ is a vector including characteristics of the woman, her husband, and the household, and R is a vector of regional dummies.

As pointed out by Tertilt (2005), the incidence of polygyny in sub-Saharan Africa is highly correlated with the lineage system of an ethnic group with polygyny being most common

in patrilineal groups. We checked this relationship in our sample and found that while 27% of the married women who were from patrilineal groups were in polygnous marriages, less than 4% of the married women from matrilineal lineage groups were.

In matrilineal kinship systems, a family's lineage is traced through the mother's bloodline, whereas in patrilineal systems, it is traced through the father's bloodline. This difference is often associated with different inheritance patterns, differences in control of land and production, differences in family's location, and women's social status (Haviland 2011). In Ghana, the Akan is the major matrilineal ethnic group and comprise about 47% of the population. Although residence patterns can differ, the general rule is natalocal residence where husbands and wives remain in the residence of their births (Schwimmer 1995). Children usually remain in the mother's house. Property is inherited from a mother's brother to her son. Bride payments among the Akan were traditionally quite low making divorce much easier than in other groups because the wife's family could easily refund the payment (Goode 1963). Moreover, polices that improve the women's situation in cases of divorce will increase bargaining power in the household leading to higher empowerment (Duflo 2012).

Since the lineage type that a woman belongs to is clearly exogenous and is highly correlated with the incidence of polygyny, it is an excellent candidate for an instrument. There is some disagreement in the literature on how to best model an endogenous dummy regressor (Angrist 2001; Heckman, 1999: Nichols, 2007; Wooldridge, 2002). We, therefore, run a traditional two stage least square regression as well as an instrumental variable regression using a technique recommended by Wooldridge (2002) for the case of an endogenous dummy regressor.[5] In addition, we run a treatment effects regression using a control function approach (Heckman 1999).[6]

Even though our instrument is clearly exogenous, it is still possible that there could be unobserved characteristics of women in matrilineal societies that are associated with higher consumption; if this is the case, the exclusion restriction for an instrumental variable would be violated.  We, therefore, also use propensity score matching (PSM) to verify the robustness of the results.  We first estimate the propensity for a woman to enter into a polygynous relationship and then match 'similar' women in monogamous and polygamous marriages by their propensity scores.  Next, we estimate the average effect of being in a polygynous marriage on expenditures (this is known as the ATT for average treatment effect in the literature).

The main advantages of the PSM approach are that it does not assume a linear relationship between the variables of interest and that it does not require an exclusion restriction.

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[5] The method consists of running a probit regression with the endogenous dummy as the dependent variable on the instrumental variable and other independent variables and then using the predicted value from that regression as the instrument in the second stage.

[6] The treatment effects model estimates two regressions simultaneously using maximum likelihood; the first regression is a probit for selection into treatment and the second (in this case) is a linear model for expenditures.  It assumes that the error terms of both equations are jointly normally distributed.

It does, however, rely on the unverifiable assumption of conditional independence which means that the outcomes are independent of participation status (in this case being in a polygynous marriage) conditional on observed characteristics (Rosenbaum and Rubin 1983). The best way to ensure that this condition is not violated is by modeling the participation decision with a sufficiently rich set of appropriate variables (Heckman et al. 1998) which we attempt to do.

Results from the OLS regressions as well as the second stages of the 2SLS regressions and the ATT from the PSM regression are reported in Table 3. The OLS and 2SLS models are run with standard errors clustered at the survey cluster level. The PSM regression uses bootstrapped standard errors. Results for the first stages of the instrumental variable regressions are reported in the appendix Table A1 and for the PSM matching in appendix Table A2.

(insert Table 3 HERE )

The OLS results reported in Table 3 column I indicate that women in polygynous marriages have lower average expenditures than their monogamous counterparts. Thus the preliminary evidence does not support the 'consumption' hypothesis, but these results may be biased if there are omitted variables that are correlated with the selection into a polygynous marriage as well as with expenditures.

Column II shows the results from the second stage of a two stage least square regression using the lineage type of the woman's ethnic group as an instrument for polygyny (results from the first stage are reported in the appendix Table A1). They indicate that when controlling for endogeneity using an instrumental variable, women in polygynous marriages still have lower average expenditures than monogamous women, but the difference is no longer statistically

significant.  This model, however, does not explicitly address the binary nature of the dependent variable in the first stage.  Thus we also run an IV regression using the predicted value from a probit regression of a dummy for whether a woman is in a polygynous marriage on her lineage type as well as the other control variables as an instrument for polygyny in the second stage (results from the first stage are reported in column 2 of Table A1 in the appendix).[7]   The coefficient on polygynous wife is negative, statistically significant and about three times that of the OLS coefficient.  Column IV reports  results from a treatment effects regression.  The first stage of the model uses a probit to estimate  the effect of the lineage type (matrilineal or patrilineal) on the probability that a woman is in a  polygynous marriage; the inverse mills ratio from this regression is then used as an additional  regressor in the second stage regression (results from the first stage are reported in column 3 in  appendix Table A1).  The coefficient on polygynous wife is again negative and statistically  significant and much larger in magnitude than the OLS coefficient.

In all four models, both the woman's and her husband's secondary education are positive and statistically significant. This is likely picking up positive income returns to education which in turn result in  higher expenditures.  Since there is likely positive assortative matching based on education in  marriages (Breierova and Duflo 2004) these coefficients might be affected by multicollinearity.  Being in an urban area is associated positively and significantly with expenditures and women who are engaged in agriculture tend to significantly lower average expenditures in all of the models as well.

Column V reports the ATT (average treatment effect on the treated) from the PSM model where the 'treatment' is being in a polygynous marriage. We report results in which the first stage matching was done using the kernel method with common support and bootstrapped errors.

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[7] This is the procedure recommended by Wooldridge (2002)

In kernel matching, treated units are matched with a weighted average of all controls where the weights are inversely proportional to the distance between the propensity scores of the treated units and the controls (Becker and Ichino 2002). [8]  The first stage results for estimating the selection into polygynous marriage are reported in the appendix table A2.   Results from the PSM show a negative and statistically significant coefficient for the average treatment effect meaning that a woman in a polygynous marriage has lower average expenditures than 'similar' women in monogamous households.

Overall, the results from four of the five regression models show a negative impact of polygyny on average expenditures (three of which are statistically significant) although the estimates vary in magnitude.  The OLS results show the smallest impact and the PSM, the largest.  Thus there is no support in the data for the 'consumption' hypothesis.

### B. *Labor Sharing Hypothesis*

In order to determine whether being part of a polygynous household enables co-wives to share the burden of work, we estimate the effect of polygyny on the total annual hours worked. Since it is quite possible that there could be omitted variables that affect both the choice to enter into a polygynous relationship and the time that a woman spends working, we again use both the IV and PSM approaches to address this concern.[9]  Total hours worked include time spent on the primary and secondary occupation as well as household chores.  The basic model is the same as in equation (1) above, with *Y,* the dependent variable, now representing total hours worked.  We also add two other control variables here that seem likely to affect a woman's work time:   the

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[8] We also matched using nearest neighbor and radius matching and found qualitatively similar results.  These are available from the authors upon request.
[9] For example, perhaps a woman is known to be particularly hard-working and thus is considered an attractive marriage parter in her community.  If she prefers to be in a monogamous (polygynous) marriage, she may be more likely to end up in such a relationship.

number of members of household per wife and the number of children in the household per wife. Table 4 reports the results of the various regressions.

(insert Table 4 HERE)

While the results from the OLS regression do show a negative impact of being in a polygynous marriage on total hours worked, the coefficient is not statistically significant. In fact, none of the results from the two-stage regressions is statistically significant. Results from the PSM regression actually show a positive and statistically significant effect of being in a polygynous marriage on hours worked.[10] The difference in results across methods here suggests that caution is required in interpreting the results. It is possible that the conditional independence restriction for PSM is violated. The results together, however, suggest that additional wives in a household do not reduce hours worked for their co-wife.

The results from the OLS, instrumental variable models, and treatment effects model all indicate that additional children in the household significantly increase the hours worked by women. Women in urban areas work fewer hours in all four models.

C. *Polygyny as Oppression for Women*

We next investigate whether there are differences in attitudes and experiences between women in polygynous and monogamous marriages. If the 'oppression' hypothesis is correct and women marry already-married men because they have little choice, then it is likely that these women will exhibit other attitudes that are indicative of powerlessness and likely worse

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[10] Results from using radius matching were identical to the kernel results, but results using nearest neighbors were not statistically significant although also positive

outcomes.[11]     It is not a necessary condition that women who are less empowered would be more

likely to end up in polygynous marriages if they are more oppressive, but evidence that this is the case would be most consistent with the 'oppression' hypothesis. The DHS survey has a series of questions on attitudes toward domestic violence which we believe are reasonable indicators of empowerment.

In addition, we use information on experiences of domestic violence to examine whether women in polygynous marriages experience more domestic violence than their monogamous counterparts. Again this is not a direct test of the 'oppression' hypothesis, but if found to be the case, would substantiate that women in polygynous unions are worse off (at least with respect to one important welfare outcome) which would be most consistent with the oppression hypothesis. We also use data on household decision-making to investigate whether women in polygynous marriages exhibit more or less bargaining power and independence than their monogamous counterparts. Thus in this section, we investigate both characteristics (in the form of attitudes) and outcomes (in terms of experiences of domestic violence and of decision making) where the outcomes may in part reflect characteristics of the woman as well as be indicative of her welfare in the marriage. It is possible that some first wives in polygynous marriages did not know that they were going to end up in a polygynous marriage at the time of marriage and so it makes sense to look at 'junior' wives separately.[12]

Table 5 presents some descriptive statistics from the DHS dataset for the dependent

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[11] There is an extensive literature on household bargaining and many variants of household bargaining models. The basic structure of such models is that members of the households arrive at outcomes either through a process of cooperative or non-cooperative bargaining (McKelroy and Horney, 1981; Thomas, 1990; Lundberg and Pollak, 1996; Chen and Woolley, 2001; Doss, 2006; Rasul, 2008). Bargaining power within the household in these models is determined by each member's fall-back position. Thus if women who enter into polygynous marriages are doing so because they have little choice, their bargaining power will be weak leading to worse outcomes compared to less oppressed women.

[12] This logic also applies to the earlier regressions in the paper, but our identification strategy and sample size do not allow us to test on only 'junior' wives.

variables that are used in the regression (all of which are dummy variables).  They include

respondents' views on the acceptability of domestic violence in various situations; whether or

not a woman has experienced different types of abuse; and whether or not she is able to influence

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various household decisions.  Summary statistics for the control variables can be found in Table

1.

(insert Table 5 HERE)


There are several questions in the DHS survey that ask women about their attitudes

towards domestic violence.  In particular, women are asked if they think it is acceptable for a

husband to beat his wife if she burns the food, if she refuses to have sex, and if she goes out

without telling him.  We run a series of probit regressions with the dependent variable a dummy

for whether the woman thinks beating is acceptable under the conditions described and include

several other controls including: the woman's age, age squared, her age at marriage, whether she

lives in a rural area, whether she has a primary or secondary education, her religion, and the

region in which she lives.[13]  All standard errors are clustered at the survey cluster level.  Unlike the

regressions testing the other two hypotheses, here we do not attempt to control for selection since

the hypothesis we are examining is related to the characteristics of women who 'select' into this

kind of relationship.  Results are reported below in Table 6:

(insert Table 6 HERE)


The results indicate that women in polygynous marriages are 18% more likely to think it

is acceptable for husbands to beat their wives if they burn food. They are 15% more likely than

women in monogamous marriages to believe it is ok for a husband to beat his wife if she refuses

to have sex.  There is no statistically significant difference between women in polygynous and

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[13] Although regional dummies are included in the regressions, they are not reported in the tables.

monogamous marriages regarding their beliefs on the acceptability of a husband beating his wife if she goes out without telling him.

Primary education was not statistically significant in any of the regressions, but women with a secondary education were less likely to be accepting of domestic violence in two of the three regressions as were women in wealthier households. The age at marriage is also negative and significant in all three cases. Women who were older at marriage are less likely to believe domestic violence is acceptable.

The 2008 DHS in Ghana also had a domestic violence module which was given to about half of the women in the overall survey. These questions are designed to ask about women's actual experience of domestic violence. We examine whether women in polygynous marriages were more likely to have been slapped, kicked, threatened, or humiliated by their husbands. There is also information on whether the respondent's fathers ever beat her mother. This variable is of particular interest since unlike the other variables that are potentially endogenous, this variable pre-dates selection into the marriage. Again we run a series of probit regressions with the dependent variables dummies for these experiences and include the same controls listed above. Results from these regressions with clustered standard errors are reported below in Table 7.

(insert Table 7 HERE)

The results from the regressions indicate that women in polygynous marriages were more likely to have experienced all forms of domestic violence than women in monogamous marriages. In addition, they were more likely to come from households in which their fathers

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were abusive towards their mothers.  It might be possible to argue that women change their attitudes towards domestic violence after they are in violent marriages in order to avoid cognitive dissonance.  If this were the case, then the results of the regressions for the experiences of domestic violence (columns I-IV in Table 7) would merely show that polygynous marriages are more characterized by domestic violence and not that the women that selected into these marriages were necessarily less empowered.   The results in column V, however, showing that women in polygynous marriages are more likely to come from households where their fathers were violent towards their mothers, indicate that the greater acceptance of domestic violence likely pre-dates the woman's marriage.  It is also possible that women who had more violent, domineering fathers may have had less power to choose who they were going to marry which would also support the 'oppression' hypothesis.

Next we investigate who in the household has the ultimate say on decisions regarding: the woman's health, large household purchases, purchases for daily household needs, and how the money earned by the woman is spent.  We use probit regressions where the dependent variable is a dummy set to 1 if the woman herself has the final say on her health and on how her earnings are spent; in the case of spending on large purchases and on daily household needs, the dummy is set equal to 1 if the woman and her partner together have the final say on these decisions[14]We regress the decision-making dummies on the polygyny dummy as well as the other control variables used above. Results for these regressions with clustered standard errors are reported below in Table 8.

(Table 8 HERE)

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[14] It seems reasonable that an individual should have the final say on her/his own health and how his/her own earnings are spent, but that a couple would make decisions on household expenditures together.

Women in polygynous marriages are less likely to have decision-making power over their own health (column 1) and on large household purchases (column 2). There is no statistically significant difference in their say over daily purchases (column 3). Women in polygynous marriages actually have substantially more control over their earnings than women in monogamous marriages. This may be because it is more difficult for a man to monitor the activities and earnings of more than one wife. Thus at least in this respect, polygynous wives appear to have more independence than monogamous women.[15]


**V. Conclusion**

This paper investigates the evidence in support of three hypotheses which try to explain why a woman might choose to enter into a polygynous marriage. We have examined the empirical evidence using data from Ghana for three different explanations and have found the evidence to be most consistent with the 'oppression' hypothesis. First, we explored whether women who enter into polygynous marriages enjoy higher consumption than women in monogamous marriages. Neither the simple OLS model nor the various models we used to correct for selection effects supported this hypothesis. Next, we checked to see whether co-wives in polygynous marriages enjoy more leisure time as a result of being able to share tasks in the household. None of the models used supported this hypothesis. Finally, we show that there is some support for the oppression hypothesis using DHS data. Regression results indicate that polygynous women are more likely than monogamous women to experience domestic violence as well as believe it is deserved in some instances. They are also more likely to come from

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[15] There are fewer observations for the earnings variable than for the others so it is possible that the difference in result is driven by a difference in sample. We ran the other three regressions restricting the sample to those with earnings and still found that women in polygynous marriages had significantly less say on their health decisions and on big purchases, but more say on daily purchases. Results available from authors upon request.

households in which their mothers experienced domestic violence. Moreover, polygynous wives are less likely to have decision-making power regarding their own health and large household purchases. However, they do have some control over their own earnings.

In general, we find that there are very few advantages for women who enter a polygynous marriage. While some scholars have suggested that polygnous unions can yield economic and social benefits to the household, we find little empirical support that women benefit from such marriages in Ghana. This does not automatically mean, however, that eliminating polygyny will immediately benefit women. The practice of serial monogamy which exists in many societies where men divorce and 'discard' older wives in favor of younger ones can be even more harmful since it reduces a man's social and economic obligation to his former wife and her children.[16]

Polygyny is one institution among many and embedded in a social and cultural context of gender norms and behaviors many of which are detrimental to women's autonomy: large spousal age gaps, differences in access to education, differences in access to productive resources are all part of this context. The direction of causality between polygyny and other facets of women's oppression is unlikely to be linear. If our interpretation of the data is correct, then women who come from households where they are less empowered are more likely to end up in polygynous marriages. Once in those marriages, they are more likely to experience domestic violence and have less decision-making power than their monogamous counterparts. Thus the direction between 'oppression' and polygyny is not uni-directional and so it would be naïve to think that eliminating this institution would end women's oppression. Since women in Ghana do not appear to benefit from polygyny however, policies to eliminate it when combined with other measures to increase women's empowerment seem unlikely to cause them harm.

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[16] We thank an anonymous reviewer for this point.

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**Table 1: Descriptive Statistics for Variables from GLSS V and DHS datasets (means with std. deviations in parentheses)**

| | GLSS | DHS |
|---|---|---|
| Polygynous marriage | 0.18 | 0.20 |
| | (0.39) | (0.40) |
| Age | 33.64 | 33.16 |
| | (7.94) | (8.11) |
| Age at marriage | 19.97 | 19.06 |
| | (3.46) | (4.09) |
| Completed Primary education | 0.14 | 0.43 |
| | (0.35) | (0.50) |
| Completed Secondary education | 0.02 | 0.08 |
| | (0.14) | (0.27) |
| Husband completed primary education | 0.26 | 0.61 |
| | (0.44) | (0.49) |
| Husband completed secondary education | 0.11 | 0.20 |
| | (0.31) | (0.40) |
| Expenditures per person (in cedi/1000) | 4247 | |
| | (4798) | |
| Wealth Index | | 2.77 |
| | | (1.51) |
| Matrilineal | 0.34 | 0.39 |
| | (0.47) | (0.49) |
| Household (hh) size | 6.22 | 5.58 |
| | (3.37) | (2.73) |
| # of children in hh* | 2.49 | 1.2 |
| | (1.96) | (1.05) |
| Catholic | 0.13 | 0.15 |
| | (0.34) | (0.36) |
| Protestant | 0.12 | 0.11 |
| | (0.32) | (0.32) |
| Other Christian | 0.14 (0.35) | 0.39 |
| | | (0.49) |
| Traditional African | 0.12 | 0.09 |
| | (0.32) | (0.28) |
| Muslim | 0.23 | 0.20 |
| | (0.42) | (0.40) |
| Urban | 0.32 | 0.36 |
| | (0.47) | (0.479) |
| Coast | 0.220 | 0.171 |
| | (0.414) | (0.377) |
| Forest | 0.346 | 0.484 |
| | (0.476) | (0.500) |
| Savanna | 0.429 | 0.344 |
| | (0.495) | (0.475) |
| Acres in land | 10.77 | |
| | (71.76) | |
| Gini coefficient for land | 0.46 | |
| | (.28) | |

*This variable is defined differently in the two datasets; the GLSS considers all children under 12, while the DHS only considers children under 5.

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**Table 2: Probit Results for Characteristics of Polygynous wife (Dependent Variable, Polygynous wife=1)**

| | GLSS | DHS |
|---|---|---|
| Age | -0.15*** | -0.085** |
| | (-3.88) | (-2.25) |
| Age squared | 0.002*** | 0.002*** |
| | (3.11) | (2.65) |
| Age at marriage | 0.04*** | 0.009 |
| | (3.16) | (0.81) |
| Primary education (baseline: no education) | -0.17 | -0.012 |
| | (-0.73) | (-0.11) |
| Secondary education | -0.003 | -0.760*** |
| | (-0.01) | (-2.612) |
| Husband primary education (baseline: no education) | -0.56*** | -0.247** |
| | (-3.43) | (-2.40) |
| Husband secondary education | .50* | 0.002 |
| | (1.66) | (0.01) |
| Expenditures per person (in cedi/1000) | 0.0 | |
| | (1.05) | |
| Wealth Index | | -0.000 |
| | | (-0.21) |
| Matrilineal | -0.219* | -0.391*** |
| | (-1.68) | (-3.47) |
| Household (hh) size | 0.300*** | 0.212*** |
| | (13.60) | (10.30) |
| # of children in hh | 0.022 | -0.009 |
| | (0.71) | (-0.18) |
| Catholic | -0.322** | -0.447*** |
| | (-2.38) | (-3.32) |
| Protestant | -0.200 | -0.279* |
| | (-1.18) | (-1.76) |
| Evangelical | -0.227* | |
| | (-1.957) | |
| Other Christian | | -0.433*** |
| | | (-3.90) |
| Traditional African | 0.085 | -0.210 |
| | (0.68) | (-1.49) |
| Urban | -0.290** | -0.061 |
| | (-2.3) | (-0.45) |
| Coast | -0.468*** | -0.152 |
| | (-2.70) | (-0.96) |
| Forest | -0.510*** | -0.050 |
| | (-3.86) | (-0.44) |
| Constant | -1.859*** | -0.623 |
| | (-5.24) | (-0.99) |
| **Observations** | **5046** | **1924** |
| **Chi-squared** | **542.93** | **340.62** |

*Note:* Robust standard errors in parentheses. Standard errors corrected for clustering

*** p<0.01, ** p<0.05, * p<0.1

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**Table 3: Wealth Inequality and Polygyny** (Dependent Variable: Dummy for Polygynous Marriage=1)

| | Individual | Cluster |
|---|---|---|
| Acres of Land | 0.00149*** | |
| | (3.922) | |
| Gini for land | | 0.441 |
| | | (1.423) |
| Age | 0.0289*** | 0.0953*** |
| | (5.982) | (3.225) |
| Age-squared | -0.000274*** | -0.00161*** |
| | (-3.797) | (-3.772) |
| Completed Primary Education | -0.275** | -0.745* |
| | (-2.308) | (-1.735) |
| Completed Secondary Education | -0.139 | 0.238 |
| | (-0.714) | (0.297) |
| Catholic | 0.0960 | 0.175 |
| | (0.600) | (0.326) |
| Protestant | -0.226 | -1.220* |
| | (-1.140) | (-1.772) |
| Other Christian | -0.112 | -0.297 |
| | (-0.636) | (-0.565) |
| Traditional African | 0.564*** | 0.909* |
| | (3.989) | (1.704) |
| Muslim | 0.432*** | 0.945** |
| | (3.224) | (2.091) |
| Regional Dummies | yes | yes |
| Constant | -1.780*** | -1.547 |
| | (-7.792) | (-1.554) |
| Observations | 2,562 | 336 |
| Chi-squared | 269 | 144 |

*Note:* Robust z-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.

**Table 4: Polygynous Wives and Expenditures Per Person** (Dependent variable: expenditures per person)

| | (I) OLS | (II) 2SLS | (III) 2SLS (Probit first stage) | (IV) Treatment | (V) PSM (ATT) |
|---|---|---|---|---|---|
| Polygynous | -37.24** | | | -150.0*** | |
| | | | | (-6.405) | |
| | (-2.064) | | | | |
| Polygynous (instrumented) | | -2,748 | 59.27 | -4.904 | |
| | | (-1.479) | (0.691) | | |
| Polygynous(ATT) | | | | (-1.578) | -271.65*** |
| | | | | | (-24.61) |
| Age | -4.987 | -53.55 | -3.259 | 0.0818** | |
| | (-1.?92) | (-1.509) | (-0.857) | (2.405) | |
| Age squared | 0.0?*** | 0.375 | 0.0737* | -0.553 | |
| | (2.453) | (1.565) | (1.952) | (-0.214) | |
| Husband Age | -0.461 | 84.61 | -3.490 | 0.00207 | |
| | (-0.178) | (1.398) | (-0.802) | (0.0874) | |
| Husband Age squared | 0.00107 | -0.573 | 0.0215 | 59.93*** | |
| | (0.0450) | (-1.365) | (0.628) | (4.000) | |
| Primary ed. | 63.24*** | ?.549 | 65.25*** | 362.2*** | |
| | (4.208) | (?.?8) | (4.392) | (5.857) | |
| Secondary ed. | 361.5*** | 334.6*** | 362.5*** | 32.88** | |
| | (5.853) | (4.995) | (5.868) | (2.351) | |
| Husband primary ed. | 37.54*** | -212.1 | 46.43*** | 156.3*** | |
| | (2.669) | (-1.237) | (3.016) | (5.961) | |
| Husband secondary ed. | 155.0*** | 129.8*** | 155.9*** | -33.70*** | |
| | (5.904) | (2.675) | (5.914) | (-2.815) | |
| Agriculture | -32.46*** | 40.93 | -35.08*** | 155.7*** | |
| | (-2.690) | (0.554) | (-2.740) | (7.387) | |
| Urban | 156.8*** | 17.26 | 161.8*** | yes | |
| | (7.423) | (0.149) | (7.630) | 259.2*** | |
| Regional Dummies | yes | yes | yes | (4.154) | |
| Constant | 225.0*** | 158.1 | 227.4*** | | |
| | (3.534) | (0.676) | (3.525) | | |
| **Observations** | **5,048** | **5,048** | **5,048** | **5,048** | |
| **R-squared** | **0.311** | | | | |
| **F** | **50.99** | **7,565** | **53.90** | | |
| **Chi-squared** | | | | **887.3** | |

*Note:* Robust t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

**Table 5: Regression Results for Hours Work**

| | (I) OLS | (II) 2SLS | (III) 2SLS (Probit first stage) | (IV) Treatment | (V) PSM (ATT) |
|---|---|---|---|---|---|
| Polygynous | -96.18 | | | | |
| | (-0.830) | | | | |
| Polygynous (instrumented) | | -953.10 | 80.20 | -56.21 | |
| | | (-0.540) | (0.185) | (-0.185) | |
| Polygynous (ATT) | | | | | 167.78*** |
| | | | | | (2.68) |
| Age | 3.308 | 20.35 | -0.200 | 3.355 | |
| | (0.232) | (0.533) | (-0.013) | (0.236) | |
| Age-squared | 300* | -0.463 | -0.267 | -0.300* | |
| | (-1.814) | (-1.228) | (-1.502) | (-1.819) | |
| Primary Education | -3.97 | -56.62 | 6.862 | -2.431 | |
| | (-0.058) | (-.460) | (0.092) | (-0.035) | |
| Secondary Education | -118.60 | -140.00 | -114.2 | -118.6 | |
| | (-1.087) | (-1.175) | (-1.043) | (-1.089) | |
| HH size/wives | -21.88 | -68.77 | -12.23 | -21.96 | |
| | (-1.114) | (-0.701) | (-0.442) | (-1.120) | |
| Children/wives | 195.0*** | 236.0*** | 186.5*** | 195.0*** | |
| | (7.343) | (2.629) | (5.719) | (7.360) | |
| Agricultural | 154.0 | 186.1 | 147.4 | 154.5 | |
| | (1.499) | (1.544) | (1.467) | (1.502) | |
| Urban | -255.8** | -302.2** | -246.3** | -255.3** | |
| | (-2.281) | (-2.023) | (-2.121) | (-2.276) | |
| Coast | -151.4 | -244.2 | -132.3 | -149.6 | |
| | (-0.568) | (-0.713) | (-0.493) | (-0.560) | |
| Forest | -62.21 | -134.3 | -47.37 | -60.42 | |
| | (-0.264) | (-0.473) | (-0.200) | (-0.256) | |
| Regional Dummies | yes | yes | yes | yes | |
| Constant | 2,232*** | 2,401*** | 2,197*** | 2,220*** | |
| | (7.537) | (5.393) | (7.344) | (7.307) | |
| **Observations** | **5,058** | **5,058** | **5,058** | **5,058** | |
| **R-squared** | **0.111** | **0.087** | **0.110** | | |
| **Chi-squared** | | | | **352.82** | |

*Note:* Robust t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1

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**Table 6: Descriptive Statistics from DHS Dataset**

| | Means (Standard Deviation) |
|---|---|
| Respondent states ok to beat if burn food | 0.0996 (0.2995) |
| Respondent states ok to beat if refuses sex | 0.1687 (0.3746) |
| Respondent states ok to beat if she goes out | 0.2471 (0.4315) |
| Respondent has been slapped by husband | 0.1359 (0.3428) |
| Respondent has been kicked by husband | 0.0714 (0.2576) |
| Respondent has been threatened by husband | 0.0740 (0.2619) |
| Respondent has been humiliated by husband | 0.1491 (0.3564) |
| Father beat mother | 0.1472 (0.3545) |
| Respondent has say on her own health | 0.6659 (0.4718) |
| Respondent has say on large purchases | 0.5848 (0.4929) |
| Respondent has say on daily purchases | 0.4051 (0.4910) |
| Respondent has say on her own earnings | 0.5385 (0.4987) |

**Table 7: Probit Results for Attitudes towards Domestic Violence (clustered standard errors)**

| | Abuse OK if Burn Food | Abuse OK if Refuse Sex | Abuse OK if Go Out |
|---|---|---|---|
| Polygynous | 0.177* | 0.146* | -0.023 |
| | (1.764) | (1.802) | (-0.270) |
| Age | -0.005 | 0.008 | -0.009 |
| | (-0.128) | (0.234) | (-0.275) |
| Age squared | -0.000 | -0.000 | 0.000 |
| | (-0.012) | (-0.238) | (0.289) |
| Age at marriage | -0.031*** | -0.022** | -0.020** |
| | | (-2.396) | (-2.051) |
| Rural | 0.075 | 0.086 | 0.147 |
| | (0.546) | (0.670) | (1.319) |
| Primary ed. | 0.104 | -0.128 | -0.0639 |
| | (0.902) | (-1.362) | (-0.843) |
| Secondary ed. | -0.455* | -0.314 | -0.391** |
| | (-1.775) | (-1.494) | (-2.263) |
| Wealth index | -0.063 | -0.075* | -0.063* |
| | (-1.329) | (-1.873) | (-1.681) |
| Catholic | 0.038 | -0.006 | -0.087 |
| | (0.299) | (-0.054) | (-0.729) |
| Protestant | 0.205 | 0.035 | -0.120 |
| | (1.332) | (0.229) | (-0.921) |
| Other Christian | -0.096 | -0.108 | -0.384*** |
| | (-0.853) | (-0.902) | (-3.670) |
| Traditional African | -0.178 | 0.093 | -0.256 |
| | (-1.061) | (0.687) | (-1.565) |
| | 0.058 | 0.070 | 0.558 |
| Regional Dummies | yes | yes | yes |
| Constant | 0.0584 | 0.0695 | 0.0558 |
| | (0.0868) | (0.107) | (0.981) |
| **Observations** | **2,072** | **2,020** | **2,069** |
| **Chi-squared** | **159.2** | **158.4** | **174.5** |

*Note:* Robust z-statistics in parentheses *** p< 0.01, **p<0.05, *p<0

**Table 8: Probit Results for Experiences of Domestic Violence**

| | Slapped | Kicked | Threatened | Humiliated | Father beat mother |
|---|---|---|---|---|---|
| Polygynous | 0.361*** | 0.290* | 0.522*** | 0.348*** | 0.232* |
| | (2.613) | (1.914) | (3.547) | (2.822) | (1.729) |
| Age | 0.021 | -0.016 | 0.074 | 0.078 | 0.067 |
| | (0.462) | (-0.275) | (1.396) | (1.604) | (1.371) |
| Age squared | -0.000 | 0.000 | -0.001* | -0.001 | -0.001 |
| | (-0.646) | (0.224) | (-1.682) | (-1.538) | (-1.584) |
| Age at marriage | -0.008 | -0.026* | -0.039** | -0.014 | -0.018 |
| | (-0.?95) | (-1.720) | (-2.516) | (-1.136) | (-1.362) |
| Rural | -0.314* | -0.172 | 0.073 | 0.176 | -0.228 |
| | (-2.151) | (-1.017) | (0.411) | (1.183) | (-1.326) |
| Primary ed. | -0.002 | 0.192 | 0.353*** | 0.086 | 0.106 |
| | (-0.020) | (?383) | (2.646) | (0.720) | (0.795) |
| Secondary ed. | -0.283 | -0.?14 | -0.478 | -0.493** | -0.614*** |
| | (-1.295) | (1.?10) | (-1.635) | (-2.426) | (-2.656) |
| Wealth index | -0.049 | 0.07 | 0.016 | 0.063 | -0.052 |
| | (-0.887) | (1.15?) | (0.252) | (1.253) | (-0.846) |
| Catholic | 0.335** | 0.342* | 0.246 | -0.006 | 0.242 |
| | (2.008) | (1.909) | (1.172) | (-0.038) | (1.376) |
| Protestant | 0.148 | 0.004 | 0.038 | -0.154 | 0.214 |
| | (0.704) | (0.0175) | (0.163) | (-0.889) | (1.195) |
| Other Christian | 0.476*** | 0.167 | 0.084 | -0.201 | 0.231 |
| | (3.191) | (0.956) | (0.430) | (-1.512) | (1.613) |
| Traditional African | 0.180 | 0.198 | 0.0478 | -0.239 | 0.433** |
| | (0.924) | (0.796) | (0.161) | (-1.093) | (2.127) |
| | (-1.100) | (-0.391) | (-2.341) | (-2.774) | (-1.989) |
| Ecological Zone | *Yes* | *Yes* | *Yes* | *Yes* | *Yes* |
| Constant | -.8787 | -.3714 | -2.039** | -2.241*** | -1.596** |
| | (-1.10) | (-0.390) | (-2.34) | (-2.77) | (-1.99) |
| Observations | 1,146 | 1,146 | 1,145 | 1,143 | 1,064 |
| chi2 | 47.55 | 55.04 | 55.04 | 44.78 | 46.16 |

*Note:* Clustered standard errors in parenthesis. *** p< 0.01, **p<0.05, *p<0.10

**Table 9: Probit Results for Decision-Making**

| | (1) Health | (2) Large Purchases | (3) Daily Purchases | (4) Earning by Women |
|---|---|---|---|---|
| Polygynous | -0.138* | -0.180** | 0.117 | 0.362*** |
| | (-1.832) | (-2.310) | (1.352) | (3.636) |
| Age | 0.0525* | 0.0660** | 0.0386 | 0.00421 |
| | (1.842) | (2.224) | (1.233) | (0.112) |
| Age squared | -0.000 | -0.000 | -0.000 | -0.000 |
| | (-1. ?) | (-1.492) | (-0.861) | (-0.200) |
| Age at marriage | .02 ** | 0.001 | -0.010 | -0.006 |
| | (2.3 ) | (0.144) | (-1.203) | (-0.742) |
| Rural | -0.04 | 0.086 | -0.262** | -0.177* |
| | (-0.371) | (0.851) | (-2.514) | (-1.662) |
| Primary ed. | 0.004 | 0.120 | 0.014 | 0.121 |
| | (0.050) | (1.584) | (0.185) | (1.418) |
| Secondary ed. | 0.129 | 0.112 | 0.116 | -0.313*** |
| | (0.871) | ( ) | (0.959) | (-2.682) |
| Wealth | 0.116*** | 0. 9** | 0.040 | 0.043 |
| | (2.945) | (2.38 ) | (1.087) | (1.010) |
| Catholic | 0.117 | 0.097 | -0.004 | -0.074 |
| | (0.998) | (0.937) | (-0.0372) | (-0.635) |
| Protestant | 0.110 | -0.088 | -0.050 | -0.068 |
| | (0.904) | (-0.763) | (-0.417) | (-0.511) |
| Other Christian | 0.175* | 0.105 | -0.022 | -0.136 |
| | (1.863) | (1.213) | (-0.216) | (-1.307) |
| Traditional African | 0.419*** | 0.231* | -0.088 | 0.145 |
| | (2.922) | (1.790) | (-0.583) | (0.729) |
| Ecological Zone Dummies | yes | yes | yes | yes |
| Constant | -1.607*** | -1.830*** | -0.591 | 0. 29 |
| | (-3.209) | (-3.705) | (-1.078) | ( .638) |
| Observations | 2,072 | 2,077 | 2,080 | 1,594 |
| Chi-squared | 108.5 | 151.6 | 109.3 | 91.01 |

*Note:* Clustered standard errors in parenthesis. *** p< 0.01, **p<0.05, *p<0.10

**APPENDIX**

**Table A1: First Stage Regressions for Regressions in Table 4**

| | (I)<br>Linear first Stage:<br>(Table 4 Col. II) | (II)<br>Probit first stage<br>(Table 4, Col. III) | (III)<br>Treatment First Stage |
|---|---|---|---|
| matrilineal | -0.0265*<br>(-1.663) | -0.382*** (-2.656) | -1.187***<br>(-10.73) |
| Age | -0.0178***<br>(-4.812) | -0.0939*** (-6.218) | |
| Age-squared | 0.000108**<br>(2.520) | 0.000707***<br>(4.095) | |
| Husband Age | 0.0314***<br>(7.545) | 0.170***<br>(8.873) | |
| Husband Age-squared | -0.000212***<br>(-5.051) | -0.00124***<br>(-6.730) | |
| Primary Education | -0.0172<br>(-1.646) | -0.255***<br>(-2.996) | |
| Secondary Education | -0.00981<br>(-0.829) | -0.559*<br>(-1.781) | |
| Husband primary ed. | -0.0876*** (-4.862) | -0.363***<br>(-3.685) | |
| Husband secondary ed. | -0.0103<br>(-0.777) | -0.125<br>(-0.777) | |
| Agriculture | 0.0284<br>(1.411) | 0.153*<br>(1.756) | |
| Urban | -0.0501** (-2.492) | -0.389*** (-2.949) | |
| | | | |
| Ecological ZOne<br>Dummies | yes<br>-0.0293<br>(-0.370) | yes<br>-2.820***<br>(-6.476) | yes<br>-0.626***<br>(-11.48) |
| **Observations** | **5,048** | | |
| **R-squared** | **0.255** | | |
| **F** | **27.37** | | |
| **Chi-squared** | | 513.8 | 46.01 |

*Note:* Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1

**Table A2: Probit results for predicting selection into polygynous marriage (PSM first stage matching)**

| | |
|---|---|
| Matrilineal | -0.281*** |
| | (-3.432) |
| Age | 0.0110*** |
| | (5.427) |
| Age at marriage | -0.0236*** |
| | (-3.008) |
| Read English | -0.361*** |
| | (-4.286) |
| Muslim | 0.537*** |
| | (8.744) |
| Traditional African | 0.516*** |
| | (7.486) |
| Urban | -0.589*** |
| | (-8.260) |
| Coast | -0.774*** |
| | (-8.472) |
| Forest | -0.680*** |
| | (-9.765) |
| Constant | -0.564*** |
| | (-3.490) |
| **Observations** | **5,047** |
| **chi2** | **1140** |

**Table A3: First Stage Results for Table 5**

| | (I) Linear first stage: (Table 5, Col II) | (II) Probit first stage (Table 5, Col.III) | (III) Treatment first stage (Table 5, Col IV) |
|---|---|---|---|
| Matrilineal | -0.0513*** | -0.469*** | -1.164*** |
| | (-3.031) | (-3.162) | (-10.83) |
| Age | 0.0202*** | 0.0877*** | |
| | (6.126) | (5.388) | |
| Age-squared | -0.000191*** | -0.000818*** | |
| | (-5.086) | (-4.316) | |
| Primary education | -0.0523*** | -0.381*** | |
| | (-5.052) | (-4.629) | |
| Secondary education | -0.0247* | -0.792** | |
| | (-1.828) | (-2.390) | |
| Poly wife hhs | -0.0551*** | -0.343*** | |
| | (-12.02) | (-10.85) | |
| Poly wife # child | 0.0480*** | 0.310*** | |
| | (7.580) | (7.391) | |
| Urban | -0.0509** | -0.382*** | |
| | (-2.565) | (-2.967) | |
| Agriculture | 0.0393** | 0.205** | |
| | (1.982) | (2.503) | |
| Coast | -0.0976** | -0.595** | |
| | (-2.510) | (-2.107) | |
| Forest | -0.0745** | -0.353** | |
| | (-2.388) | (-2.045) | |
| | | | |
| Ecological Zone Dummies | yes | yes | yes |
| Constant | 0.189*** | -0.985*** | -0.628*** |
| | (2.762) | (-3.027) | (-11.45) |
| Observations | **5,048** | **5,048** | **5,048** |
| R-squared | **(0.251)** | | |
| Chi-squared | | **424.88** | |

*Note:* Robust t-statistics in parentheses. *** p<0.01, ** p<0.05, * p<0.1