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MARRIAGE MARKET



Marriage Market in Pakistan Consanguinity, Educational Assortative Mating, and Fertility

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C O N T E N T S

	<i>Pages</i>
Abstract	v
Introduction	1
Literature Review	2
Consanguineous Marriages and Reasons for their Prevalence	2
Educational Hyper/Hypogamy in the Marriage Market	3
Consanguinity and Fertility	4
Data and Methods	5
Variables	6
Dependent Variable	6
Independent Variables	6
Control Variables	6
Methods	7
Results	7
Consanguineous Marriages, Educational Assortative Mating, and Time: Multivariate Analysis	9
Consanguinity, Educational Assortative Mating, and Fertility	11
Consanguinity, Educational Assortative Mating, and Fertility: Multivariate Analysis	13
Discussion	15
References	18

List of Tables

Table 1.	Logistic Regression Predicting Consanguineous Marriages (N=40,950)	10
Table 2.	Logistic Regression of Predicting Contraceptive Use by Cousin Marriages and Time (N= 40,950)	13
Table 3.	Multivariate Analysis of Mean Children Ever Born by Consanguinity and Time (N=40,950)	14

List of Figures

Figure 1.	Type of Relationship with Husband	8
Figure 3.	Educational Assortative Mating	8

	<i>Pages</i>
Figure 4. Educational Assortative Mating among Heterogeneous Couples	9
Figure 5. Educational Assortative Mating by Relationship Type	9
Figure 6. Mean Age at Marriage by Relationship Type	11
Figure 7. Contraception by Type of Relationship	12
Figure 8. Mean Number of Children Ever Born by Relationship Type	12
Figure 9. Percentage Distribution of Total Farm Land by Type of Land Tenure	9
Figure 10. Percentage Distribution of Monthly Consumption Expenditure Per Households by Commodity Groups	10
Figure 11. Percentage Share of Food Expenditure in Total Household Consumption Expenditure (Engel's Coefficient)	11
Figure 12. Percentage Share of Food Expenditure in Total Household Consumption Expenditure by Income Quintiles	11

ABSTRACT

Nearly half of all marriages in the country are consanguineous, with 29 and 21 percent of women marrying first cousins on their father's and mother's sides, respectively. Despite its high prevalence, little is known about the change over time in consanguineous unions in Pakistan. Examining the patterns of the marriage market is particularly important given the substantial improvement in women's education as education of females is associated with the decline in consanguineous unions across the world. Our analysis, based on four waves of nationally representative PDHS (1990-91, 2006-07, 2012-13, and 2017-18), shows that the prevalence of consanguineous unions remains stable over time. Further, women's education is negatively associated with cousin marriages. Hypergamous (husband is more educated than wife) unions are more prevalent, but a consistent rise in educational hypogamy (wife is more educated than her husband) is observed during this period. However, the increase in hypogamy has not changed the marriage market dynamics. The results show that consanguineous marriages are more likely to be hypogamous than non-consanguineous marriages. Moreover, contraceptive use is lower among women in consanguineous unions. We found the inverse relationship between the mean fertility (so far) and cousin marriages. Women in consanguineous marriages are likely to have fewer children than women in non-consanguineous marriages. Interestingly, women in hypogamous relationships are likely to have fewer children than women in which both partners have the same level of education. Overall, the results show that consanguinity patterns are stable, and there is no evidence that the societal changes such as improvement in women's education and urbanisation over time have not led to a decline in cousin marriages in Pakistan.

INTRODUCTION

Conventionally, consanguineous unions are preferred in the marriage market of Pakistan. Nearly half of all marriages in the country are consanguineous, with 29 and 21 percent of women marrying first cousins on their father's and mother's sides, respectively (NIPS, 2018). Preference for consanguineous marriages is inextricably linked to several cultural and socio-structural aspects in a society. These facets include but are not limited to, agnatic solidarity, effort to enhance familial bond, economic considerations related to dowry, family support in times of marital conflict, and relatively less independence for mate selection in a culture (Agha, 2016; Hussain 1999; Lin, Desai, & Chen 2020; Mobarak et al., 2019). The preference for a particular marital relationship could have implications on broader familial contexts and outcomes. Studies from different countries suggest a positive association of consanguineous marriages with high fertility, women's young age at marriage, early-age childbearing, and child mortality (Fareed et al., 2017; Islam, 2012). The previous studies on consanguineous unions at the national level in Pakistan were done a long time ago (Afzal, Ali, and Siyal 1994; Hussain and Bittles, 1999, 2000). Since then, a lot has changed in terms of educational levels, gender dynamics, social norms, and practices. For example, school enrollment rates for females at the tertiary level have increased from 0.89 percent in 1992 to 8.32 percent in 2018. Similarly, education attainment for women with at least bachelor or equivalent degrees rose to 6 percent in 2015 from 2 percent in 2011 (World Bank, 2021). Despite the high prevalence of consanguineous marriages in Pakistan, little is known about the trends over time in relationship preferences, educational assortative mating, and interaction of these preferences with education, mate selection, and fertility behaviour.

This study examines trends in consanguineous marriages and variations in spousal educational differences over time in consanguineous and non-consanguineous unions. Over the years, educational levels for all the population have increased, but more importantly, an increase in women's participation in higher education has been observed (GoP, 2018; World Bank, 2021). However, in Pakistan, labour force participation, even among women with a high level of education, is low; just about one-fourth of Pakistani women with a college degree work outside the home (ADB, 2016). Due to entrenched gender roles, women spend more time doing unpaid domestic work and less time working in the paid labour market than men do. The more tremendous stress on the conventional division of labour within the family, even for the women with higher education, may lead to educational variations in mate selection.

Traditionally, the South Asian marriage market remains educationally hypergamous (husband more educated than wife). However, it would be interesting to study whether educational transitions shifting this trend towards more hypogamous (wife is more educated than husband) in context to consanguineous marriages in Pakistan. Women in consanguineous unions get married early, hence having fewer chances of

higher education. Therefore, we expect that consanguineous unions would still be predominately hypergamous in Pakistan, whereas non-consanguineous unions may be shifting towards educationally hypogamous marriages. The literature worldwide shows that women in consanguineous unions have a younger age at marriage than women in non-consanguineous unions. Similar results have been found in Pakistan. We expect that women in non-consanguineous unions get more time to pursue higher education due to the relatively late age at marriage and, therefore, a higher likelihood of being in the formal job market. Through this mechanism, women in non-consanguineous unions are exposed to a larger pool of potential marriageable partners and exercise their rights to marry men of their choice due to acquired empowerment over the years by gainful employment or higher education. We expect that couples in non-consanguineous unions would be in educationally hypogamous marriages.

Another aspect that we are examining in this study is the association between consanguinity and the fertility net of other socio-demographic factors. In South Asia, compared to those married to non-relatives, women in first-cousin unions have higher fertility. (Hussain & Bittles 2004; Nawaz, Zaman & Malik 2021). On the other hand, consanguineous unions are associated with increased mortality, congenital anomalies, and negative reproductive outcomes (Kanaan, Mahfouz, & Tamim, 2008; Rittle, et al. 2001). Albeit, literature is non-conclusive on the link between consanguinity and fetal loss (Jaber & Halpern, 2014). The high prevalence of fertility among consanguineous unions in Pakistan could be due to the above-mentioned negative reproductive outcomes, but we also suspect a strong social dimension is linked to it. With the weak institutional support for childcare in the country, families from both maternal and paternal sides usually take part in rearing children. The couples in consanguineous unions may be getting more familial support in raising children, hence opting for having more children than couples in the non-consanguineous unions. We expect couples in consanguineous unions to have higher mean Children Ever Born (CEB) and low contraceptive use.

This study examines the following questions: what relationship trends prevail in the Pakistani marriage market? How is improvement in women's education linked to changes in educational assortative mating patterns? In other words, is the Pakistani marriage market shifting from hypergamous to hypogamous unions? Third, does educational assortative mating influence consanguinity in Pakistan? Furthermore, to what extent does a particular type of relationship explain fertility behaviour, i.e., mean age at marriage, the mean number of children, and contraceptive use? In the next section, we review the literature from Pakistan and countries where consanguineous unions are common—followed by the results section. Lastly, we discuss our findings and their implications.

LITERATURE REVIEW

Consanguineous Marriages and Reasons for their Prevalence

Consanguinity is common in many societies, especially in Arab and South Asian countries. The preference for consanguineous unions presents a complex interplay of socio-cultural norms, historical and structural factors persisting in these societies. For example, a study in Iran explored the impact of education, urbanisation, and changes in

economic production on the prevalence of consanguineous marriage. The study reveals that, despite modernising pressures, the practice of marrying biological relations has remained remarkably robust. On the other side, attitudes on marrying a non-relative have evolved. The study concluded that in Middle Eastern countries, modernisation trend would not necessarily limit consanguineous marriages, raising the question of whether endogamy is a structural element in a culture resistant to change? (Abbasi-Shavazi, McDonald, & Hosseini-Chavoshi, 2008).

Similarly, Do & Joshi (2013) claimed that consanguinity is a response to a marriage market failure in developing countries rather than an outcome of culture, religion, or personal choices. The authors asserted that marriage is a contract between two families in which they agree to support their children for the rest of their lives through gifts, bequests, and other means. These factors also raise the match's worth and, as a result, each family's social prestige.

Studies from Pakistan show various reasons for consanguineous marriages in Pakistan. According to Hussain (1999), the high demand for consanguinity stems from socio-cultural factors rather than anticipated economic benefits such as family property consolidation or smaller, less expensive dowries (Hussain, 1999). In an ethnographic study done in a rural area of Pakistan, Agha (2016) discussed why consanguineous marriages are essential to the kinship system. Parents find consanguineous marriages socially secure for their children, while women prefer such unions for the convenience of staying close to their parents' families. According to the study's findings, teenage marriage, woman's less education, and an early mother age are all important consequences of these partnerships. Women see no other option than to conform with the patriarchal system since it is rigorously patriarchal, and by doing so, they serve to maintain that order. The author argued that sometimes consanguineous unions are the lowest risky options for women in the future marital system's downsides, such as early maternity or baby loss. Their condition would be significantly worse if they are married outside their kin group (Agha, 2016).

Educational Hyper/Hypogamy in the Marriage Market

The tendency for women to marry up in terms of education or other attributes related to financial well-being is known as hypergamy (Rose, 2005 p. 2). Educationally hypergamous marital unions are when the wife is less educated than her partner. In contrast, homogamous unions refer to marriages where the wife has an equivalent or higher educational attainment than her partner (Esteve, García-Román, & Permanyer, 2012 p. 535). Over the years, a decline in educationally hypergamous unions has been observed for developed and developing countries alike (Esteve et al., 2016). For example, a study that examined the trends from 1968- 2009 in educational hypergamy for 56 countries reported that with few exceptions, there is a steady decline in hypergamy throughout time (Esteve, García-Román, & Permanyer, 2012).

Two explanations that seem most relevant in this context (educational hypergamy) are changing gender norms and rising educational levels for women in most countries (Chudnovskaya & Kashyap 2020; Esteve et al., 2016; Lin, Desai, & Chen 2020; Van Bavel, 2012). However, literature is non-conclusive in terms of the former explanation for the decline in educational hypergamy. As Lin, Desai, & Chen (2020) argued, the drop

in educated hypergamy and the continued rise in hypogamous marriages do not point to a positive shift in gender norms in India. They found that consanguineous marriages are more hypogamous than non-consanguineous marriages, which, to authors' interpretation, exhibit substantial cultural restraints on spouse selection in India. They argued that "the rise in hypogamous marriage by education paradoxically reflects deep-rooted gender scripts in India given that other salient social boundaries are much more difficult to cross (Lin, Desai, & Chen 2020, p 1215)."

There is hardly any study on educational assortative mating in Pakistan. Since 50 percent of the marriages in Pakistan are still consanguineous, an insight into educational dynamics within consanguineous and non-consanguineous unions will be helpful. Studies with the local population in Pakistan are non-conclusive about the association of education with consanguinity. For example, Riaz, H. F., Mannan, S., & Malik, S. (2016) found that illiteracy is a significant predictor of consanguinity in Rahim Yar Khan district. Furthermore, women whose husbands are manual labourers or unskilled workers and women whose parents were in consanguineous marriages are more likely to be in the consanguineous union. While, Jabeen, & Malik, (2014) in their study in the Bhimber district, reported that when comparing the literate and non-literate groups, consanguinity was considerably greater in the literate group. They argued that although literacy has been demonstrated to be linked to consanguinity, the relationship is not necessarily inverse. Jabeen & Malik (2014) argues that education, as it is widely assumed, has a diminishing effect on the frequency of consanguinity. However, in cultures where there has not been a considerable change in the social order, education may have a rising impact on shrinking consanguinity due to societal pressure and economic imperatives.

Over the years, educational levels for all the population have increased in Pakistan, but more importantly, an increase in women's participation in higher education has been observed (GoP 2018; World Bank Data 2021). As mentioned earlier, the marriage market in the South Asian context is predominantly hypergamous. Therefore, it is interesting to examine whether improvement in women's education between 1990-2018 is associated with shifting this trend towards more hypogamous in context to consanguineous marriages in Pakistan. Therefore, we hypothesise that:

Hypothesis 1: Women who have no formal education or low level of educational attainment are more likely to be in consanguineous marriages than women with a high level of educational attainment.

Hypothesis 2: Consanguineous unions would still be predominately hypergamous in Pakistan, whereas non-consanguineous unions may be shifting towards educationally hypogamous marriages over time.

Consanguinity and Fertility

It is debatable how and why fertility behaviour differs between consanguineous and non-consanguineous unions? This is because a considerable amount of research has looked at the impact of consanguinity on reproductive behaviour, pregnancy, and health outcomes. For example, Al Kandari (2007) found that females who marry in consanguineous marriages had higher abortion, termination, and stillbirth rates. Fertility was higher among Muslim women and those in a consanguineous marriage (Al Kandari, 2007). It is argued that consanguinity has the principal effect of increasing the rate of

homozygotes for autosomal recessive genetic illnesses. Tadmouri et al. (2009) found a high prevalence of recessive illnesses among Arabs, many of which are linked to consanguinity. Omer, Farooq & Jabeen, S. (2016) also found a negative association between cousin marriages and mother and child health outcomes. In India and Pakistan, women in first-cousin partnerships have higher fertility than those married to non-relatives. Consanguinity was linked to various direct and indirect fertility predictors, including lower mother education, maternal age at marriage, contraceptive use, and rural living (Hussain, R., & Bittles, 2004). The higher fertility in consanguineous marriages may be due to adverse negative pregnancy or child health outcomes. Nevertheless, the high fertility in consanguineous marriages may also be due to the overall familial or kin support, including related to child-rearing due to close relative network ties as reported by the studies (Agha 2016; Do & Joshi 2013; Hussain, 1999). However, either debate in the literature remains contested.

Another critical determinant of consanguineous marriages is a woman's age. In consanguineous marriages, women marry at a younger age than in non-consanguineous relationships (Agha 2016; Audinarayana, & Krishnamoorthy 2000; Donbak, 2004). Women who marry at a younger age have more children due to the longer time in reproductive cycles, which could be one factor that explains the higher fertility rate in consanguineous marriages. Moreover, studies report the contraception use among consanguineous couples is lower than non-consanguineous couples (Bhatta & Haque 2015; Islam, 2013). Based on findings of earlier studies, we hypothesise that:

Hypothesis 3: Mean fertility (CEB so far) will be higher in consanguineous marriages than in non-consanguineous unions.

Hypothesis 4: Contraceptive use will be low in consanguineous marriages than in non-consanguineous unions.

DATA AND METHODS

The data has been taken from four rounds of the Pakistan Demographic Health Survey (PDHS) 1990-91, 2006-07, 2012-13, and 2017-18. PDHS are publicly available, nationally representative surveys of women between the age of 15–49 years, conducted by ICF International in collaboration with the National Institute of Population Studies (NIPS). Standardised questionnaires allow for comparisons across countries and survey waves. The analysis spans almost 30 years, from 1990 to 2018. DHSs collect detailed information on mother and child health, fertility history, family planning, reproductive health, nutritional and immunisation status, marriage and sexual activity, and husband's background. The sample size of ever-married women aged 15-49 is 6, 611 in 1990-91, 10,023 in 2006–2007, 13,558 in 2012–2013, and 12, 364 in 2017–2018.

Various pre-analysis exclusion criteria are applied. We excluded women who reported more than one marital union and had missing information on the number of unions. Further, we dropped women whose information on the relationship with their husbands is missing. We also excluded women who either did not provide information on their husbands' education or did not know about their husbands' education. The final analytical sample across four waves thus is 6,438 for 1990-91; 9,715 in 2006-07; 13, 179 in 2012-13, and 11,618 in 2017-18.

VARIABLES

Dependent Variable

For the present study, we have three dependent variables.

Consanguineous versus Non-consanguineous Marriages

The variable of interest—consanguineous marriages—is taken from the question of the women’s relation to her husband and is categorised as a first cousin, second cousin, and unrelated. For multivariate analysis, marriage type is categorised as consanguineous and non-consanguineous.

Ever Use of Contraception

This measure, asked only of wives, is based on the question, “Have you ever used any method to delay or avoid getting pregnant?” Ever use of contraception use is a dichotomous measure and refers to both modern and traditional methods. If a woman reported using any method, she was coded 1 and 0 for otherwise.

Mean Children Ever Born

Children Ever Born (CEB) contains information on the number of all children born alive (lifetime fertility) up to the survey date. CEB is treated as an interval scale in both bivariate and multivariate analyses.

Independent Variables

Women’s education: Women’s education is categorised into three categories: no formal education, primary education (grades 1-5), secondary education (grades 6-10), and higher education (grades 11 & above).

Spousal educational homogamy is measured as the same level of education; the husband is less educated than the wife, the husband is more educated than the wife, and both have no formal/below primary education. The same level of education is treated as in which both husband and wife had at least a primary level of education.

Change over time: Survey years are included to examine change over time.

Control Variables

We control for women’s age, women’s employment status, parity (number of living children), experience child loss, and rural-urban residence. *Women’s age* is represented by a three-category variable: 15-24 years old, 25-34 years old, and 35 years old and above. *Age at marriage* is a continuous variable. *Women’s work status* is a dichotomous measure. *The number of surviving children* is represented by a three-category measure: 0-2 living children, 3-4 living children, more than 4 living children. A dummy variable for *experiencing child loss* is also included in the analysis. To account for *urban-rural* differentials, we included a dichotomous indicator of urban-rural residence with rural as the reference category.

Methods

Descriptive statistical techniques are used to observe the prevalence and trends of consanguinity. We also looked at the differentials in various socio-demographic variables by consanguinity. Further, we performed the comparative analysis of consanguineous and non-consanguineous marriage types by husband/wife's educational attainment. Third, we looked at the association between consanguinity and fertility. We used age at marriage, mean number of living children, and contraceptive use as our measures of fertility. The statistical significance of associations between consanguinity and various determinants is tested by applying the chi-squared test.

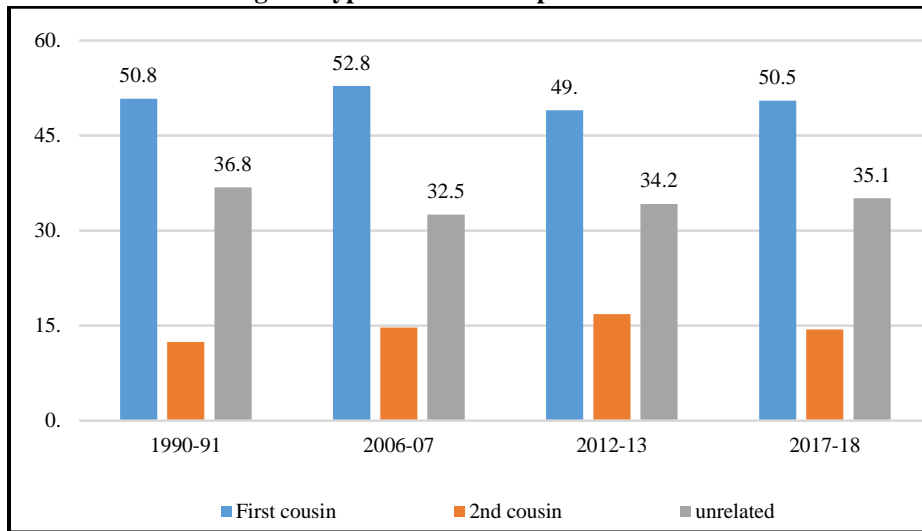
For the multivariate analysis of the correlates of consanguinity, marriage type was categorised as consanguineous and non-consanguineous. Binary logistic regression is performed to examine the change over time in consanguinity. Further, we looked at how women's education and spousal educational homogamy are associated with consanguinity (Table 1). Similarly, we also used binary logistic regressions to examine the association between consanguinity, education, and contraceptive use (Table 2). In addition, we also performed multivariate linear regression to test the association between consanguinity, education, and children ever born (Table 3). In all three analyses, we pooled the sample of all four waves of PDHS and have included the survey year as a covariate to uncover the effect of time. In Model 1, we only introduced survey years to see change over time in the above-mentioned variables, i.e., consanguinity, contraceptive use, and mean children ever born. In Model 2, we introduced women's education and spousal educational homogamy variable. In Model 3, we have introduced other socio-demographic characteristics to see how the effect of time accompanied by education changes after controlling other variables.

One of the study's main objectives is to look at trends over time in cousin marriages and fertility patterns; we applied the sample weights to account for the clustering and complex survey design. The analysis is weighted and done using the `svy` command in stata 13.

Results

Trends over time in Consanguineous Marriage

Figure 1 shows the prevalence of consanguineous marriages in Pakistan from 1990-2018. During the last three decades, the patterns of cousin marriages exhibit minor variations with predominantly cousin marriages. More than 50 percent of the marriages are among the first cousins, either from the maternal or paternal side. Only one-third of the marriages are non-consanguineous unions. Contrary to expectations, that increase in women's education and other societal changes such as urbanisation leads to a decline in cousin marriages. However, there is no evidence that these societal changes are associated with a reduction in first-cousin marriages. In fact, the prevalence of first-cousin marriages remained stable or even increased over time.

Fig. 1. Type of Relationship with Husband

Educational Assortative Mating and Consanguinity

However, some interesting changes are observed in spousal educational differences. As mentioned above, since 1990, there has been a substantial improvement in women's education statistics. This pattern of increase in women's education is reflected in the marriage market. Though educational hypergamy persists, a consistent educational hypogamy pattern emerges over time. There is only 4 percent of couples in which wife was more educated than her husband in 1990. This percentage increased to 17 percent in 2017-18. Similarly, there is a considerable decline in couples with no formal education (Figure 3 & 4).

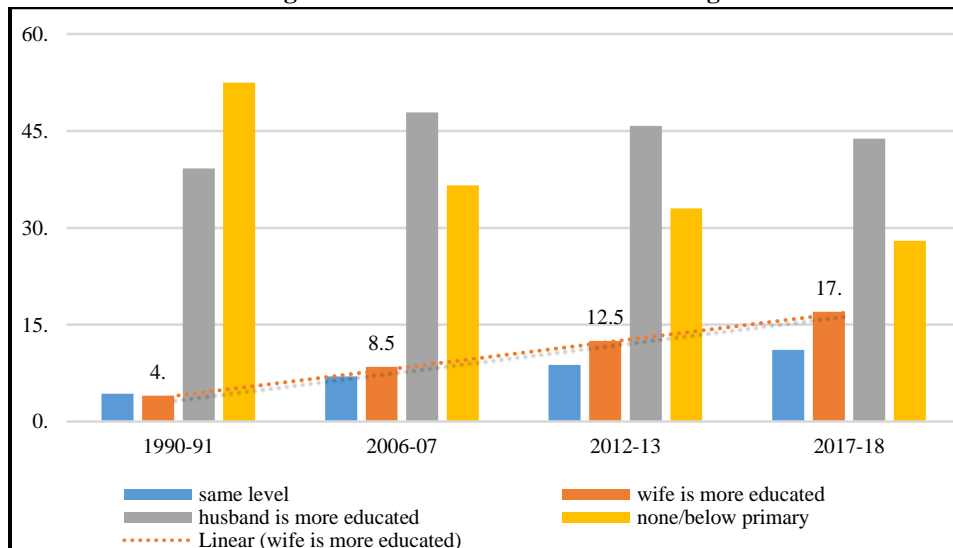
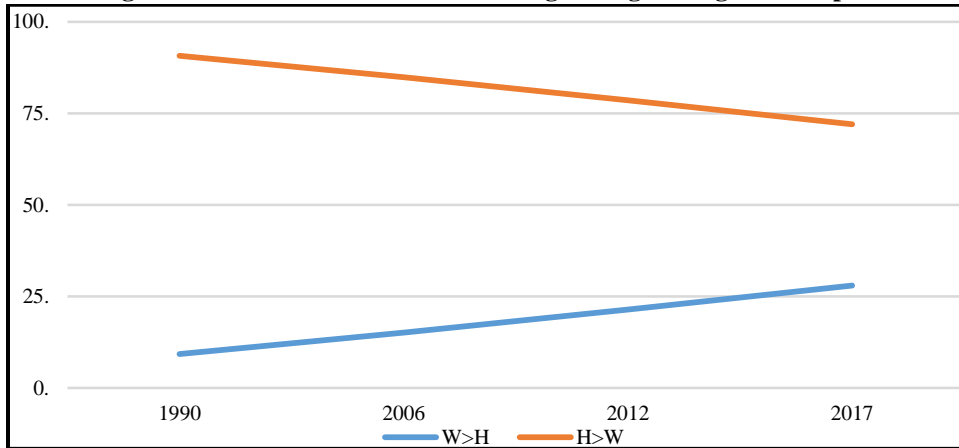
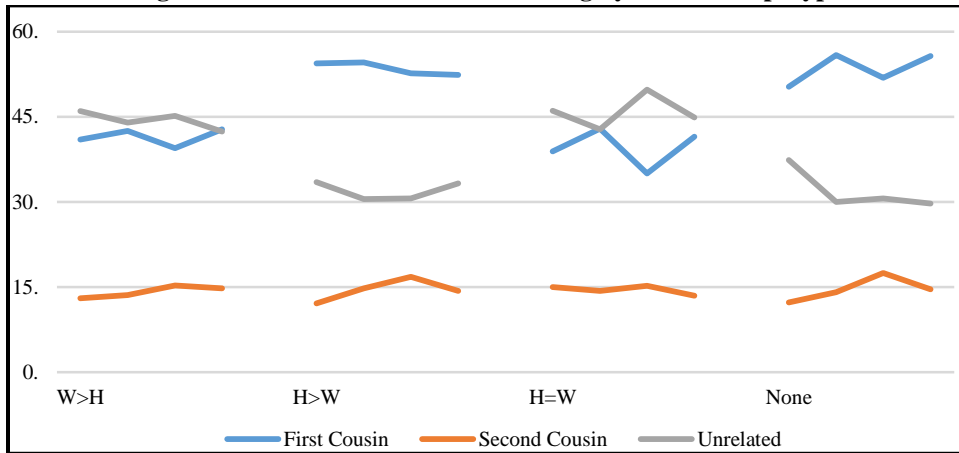
Fig. 3. Educational Assortative Mating

Fig. 4. Educational Assortative Mating among Hetrogeous Couples

The association between formal education and consanguinity is still prevalent. The phenomenon of educational hypogamy or homogamy is more common among non-cousin marriages than cousin marriages. Whereas consanguineous marriages are more common in which the husband is more educated than his wife or both spouses, have no formal education (Figure 5). However, over time, we do not see any significant variation in educational assortative mating by relationship type.

Fig. 5. Educational Assortative Mating by Relationship Type

Consanguineous Marriages, Educational Assortative Mating, and Time: Multivariate Analysis

Table 1 presents the logistic regression models predicting consanguineous marriages. Model I is the baseline model, including only survey years, Model II adds women's education and educational homogamy, and in Model 3, we added other socio-demographic control variables. Results show that the odds of cousin marriages are 20 percent higher in 2006-07 than in 1990-91 (OR=1.21).

We add women's education and educational homogamy variables in Model II to test whether these factors are associated with consanguineous marriages. When we added the education variables, though the direction of association remains the same but the significance and magnitude of time variable has changed. The results indicate that the odds of cousin marriages are 30 percent higher in all periods than 1990-91.

Table 1

Logistic Regression Predicting Consanguineous Marriages (N=40,950)

Variables	Model I	Model II	Model III
Year (ref=1990)			
2006-07	1.21**	1.30***	1.27***
2012-13	1.12	1.27**	1.23**
2017-18	1.07	1.29***	1.29***
Women's education (ref=No formal education)			
Primary		0.82***	0.89*
Secondary		0.58***	0.71***
Higher		0.41***	0.57***
Spousal Educational Homogamy (Both have the same level of education; primary or above)			
Wife is more educated than the husband		1.12+	1.06
Husband is more educated than the wife		1.26***	1.22***
Both have none or below primary education		1.07	0.99
Age (ref=15-24)			
25-34			0.86***
35+			0.81***
Age at marriage			0.97
Women's work Status (ref= out of labour force)			
In the labour force			1.27***
Place of residence (ref=rural)			
Urban			0.67***
Constant	1.72***	1.65***	3.90***

+ (p<0.10), * (p<0.05), ** (p<0.01), *** (p<0.001).

The results show that women with higher education are 60 percent less likely to be in cousin marriages. Similarly, women with secondary education are 42 percent, and women with primary education are 20 percent less likely to marry a cousin than women with no formal education. The results support our hypothesis 2 that consanguineous marriages are more common among women with a low level of education. Model II also

shows that couples in which husbands are more educated than wives have a 26 percent higher likelihood of entering into cousin marriages than those with the same level of education. However, we do not find support for our hypothesis that the odds of non-consanguineous marriages will be higher in hypogamous couples.

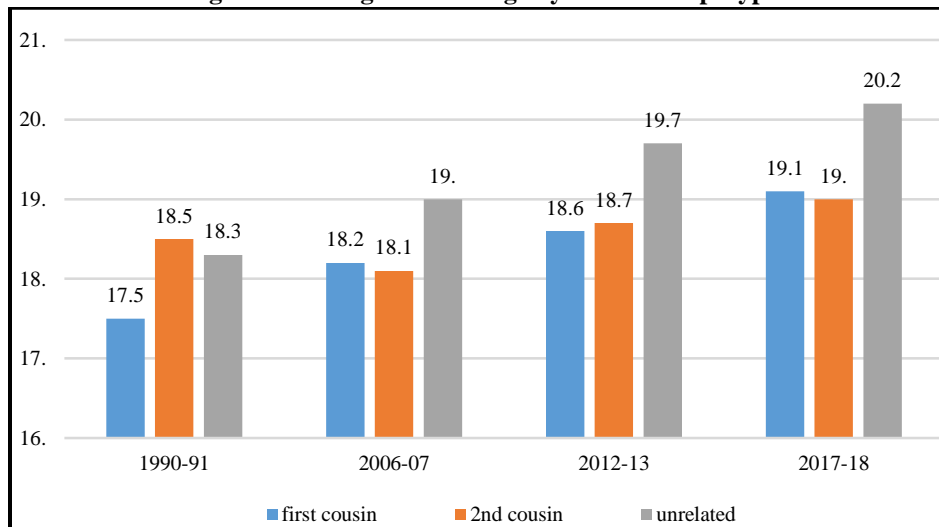
In Model 3, we include socio-demographic controls. We find that the results of the main variables of interest remain the same. The results show that aged women have lower odds of entering cousin marriages. Age at marriage is significantly associated with cousin marriages. Women residing in urban areas are 33 percent less likely to be in cousin marriages than their rural counterparts. However, interestingly, we find that women in the labour force are 27 percent more likely to be in consanguineous marriages than women out of the labour force.

Consanguinity, Educational Assortative Mating, and Fertility

Mean Age at Marriage

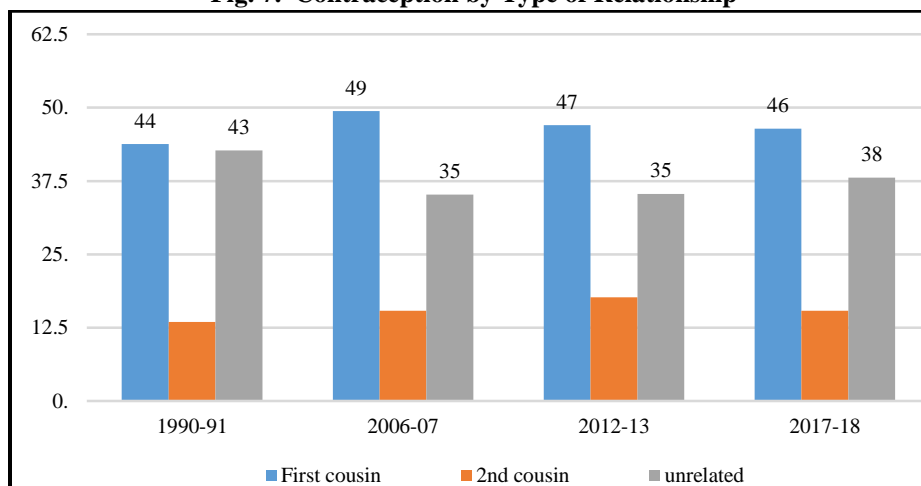
The mean age at marriage has significantly increased over time across all relationship types. However, the increase is much higher among non-cousin marriages. In 1990, the mean age at marriage among unrelated couples was 18.3 which has increased to 20.2. The mean age at marriage is 1.1 years higher among non-cousin marriages than cousin marriages in 2017 (Figure 6).

Fig. 6. Mean Age at Marriage by Relationship Type



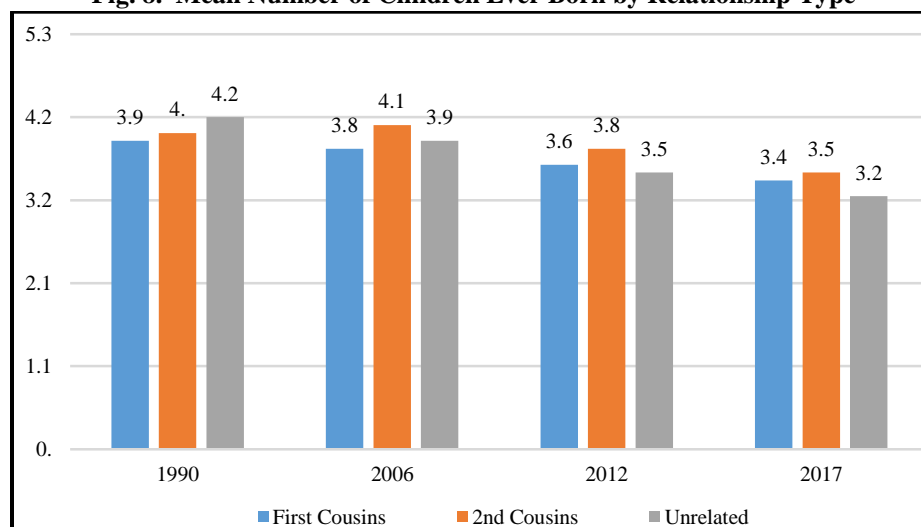
Contraceptive Use

Interestingly, the use of contraception showed a different pattern. Contrary to our expectation, contraception is significantly higher in first-cousin marriages than non-cousin marriages over time. Though a decline is observed in contraceptive use among cousin marriages, a catch-up trend in contraception has recently been observed among non-cousin relationships.

Fig. 7. Contraception by Type of Relationship***Mean Number of Children Ever Born (so far)***

The relationship between consanguinity and the mean number of children ever born (so far)/ births have changed over time. In 1990, the mean number of children ever born was higher among non-consanguineous couples than consanguineous marriages (Figure 8). However, this relationship has reversed over time, and now the mean number of children ever born is higher in cousin marriages than among unrelated couples.

The higher mean number of children ever born in cousin marriages could be the result of high child mortality among cousin marriages. This is confirmed by the experience of child loss by relationship type (not shown). The pattern of child mortality remains consistent over time, with predominantly higher child mortality in first-cousin marriages and lower in marriages among unrelated couples.

Fig. 8. Mean Number of Children Ever Born by Relationship Type

Consanguinity, Educational Assortative Mating, and Fertility: Multivariate Analysis

Consanguinity, Educational Assortative Mating, and Contraceptive Use

Table 2 examines how contraceptive use is influenced by relation to the husband. Again, Model I is the baseline model, including survey years and consanguineous marriages. The results show that contraceptive use has significantly increased over time. The most significant change is observed for 2012-13, in which the odds of using contraceptives are 4.6 times as high compared to 1990-91. The findings are consistent with the overall pattern of contraceptive use among women aged 15-49 in Pakistan. Contraceptive use was around 35 percent in 2012-13 before reaching a plateau. A percentage decline in contraceptive use is reported in 2017-18 PDHS (NIPS, 2013; 2018). Model I also shows that contraceptive use is 20 percent lower among women in cousin marriages than non-cousin marriages. The results support our hypothesis of lower contraceptive use in consanguineous marriages (Hypothesis 4).

Table 2

Logistic Regression of Predicting Contraceptive Use by Cousin Marriages and Time
(N= 40,950)

Variables	Model I	Model II	Model III
Year (ref=1990)			
2006-07	3.61***	3.27***	3.93***
2012-13	4.57***	3.95***	5.18***
2017-18	3.40***	2.74***	3.38***
Consanguineous marriages (Ref=unrelated)			
Cousin	0.81***	0.87***	0.96***
Women's education (ref=No formal education)			
Primary		1.58***	1.91***
Secondary		1.93***	2.52***
Higher		2.10***	2.95***
Spousal Educational Homogamy (Both have the same level of education; primary or above)			
The wife is more educated than the husband		0.87*	0.93
Husband is more educated than the wife		1.02	1.01
Both have none or below primary education		0.79**	0.73***
Age (ref=15-24)			
25-34			2.52***
35+			1.30***
Age at marriage			0.99
Number of surviving children (ref=0-2)			
3-4			4.60***
more than 4			6.62***
Women's work Status (ref= out of labour force)			
In the labour force			1.09*
Place of residence (ref=rural)			
Urban			1.75***
Constant	0.29***	0.27***	0.04***

+ (p<0.10), * (p<0.05), ** (p<0.01), *** (p<0.001).

In Model II, we added women's education and couple educational homogamy variables. The findings indicate that contraceptive use is higher across all educational categories but more so for women with higher education. Women with higher education are two times more likely to use contraception than women with no formal education. Similarly, women in hypogamous couples (wife is more educated than her husband) and couples having none or below primary education are less likely to use contraceptives than couples in which both spouses have similar levels of education.

In Model III, we included other socio-demographic controls. The relationship between the main variable of interest and contraceptive use remains unchanged after adding these controls, except that contraceptive use among hypogamous couples becomes insignificant. Women in urban areas having four or more surviving children, aged 25-34, and the labour force are significantly more likely to use contraception.

Consanguinity, Educational Assortative Mating, and Children Ever Born

Multiple linear regression is used to examine the fertility differentials over time and by consanguinity and education (Table 3). The dependent variable (CEB) is on a continuous scale. We analysed the mean number of children ever born. Results show that there is a significant positive association between survey year and children ever born. For instance, women in 2012-13 tend to have more children than women in 1990-91 (Model 1). The results show that women in consanguineous marriages are likely to have fewer children than women in non-consanguineous marriages ($\beta = -0.14$).

Table 3

Multivariate Analysis of Mean Children Ever Born by Consanguinity and Time
($N=40,950$)

Variables	Model I	Model II	Model III
Year (ref=1990)			
2006-07	0.17***	0.24***	0.02*
2012-13	0.19***	0.30***	0.04***
2017-18	0.09*	0.24***	0.03**
Consanguineous marriages (Ref=unrelated)			
Cousin	-0.14***	-0.18***	-0.02*
Women's education (ref=No formal education)			
Primary		-0.36***	-0.04**
Secondary		-0.45***	-0.06
Higher		-0.14*	-0.01
Spousal Educational Homogamy (Both have the same level of education; primary or above)			
The wife is more educated than the husband		-0.29***	-0.05**
Husband is more educated than the wife		-0.06	-0.01
Both have none or below primary education		0.03	0.01
Age (ref=15-24)			
25-34			2.00***
35+			4.18***
Ever use of contraception (ref=no)			
yes			0.06***
Experience child loss (Ref=no)			
Yes			0.12***
Women's work Status (ref= out of labour force)			
In the labour force			-0.003
Place of residence (ref=rural)			
Urban			0.04***
Constant	3.67***	3.80***	1.19***

+ (p<0.10), * (p<0.05), ** (p<0.01), *** (p<0.001).

In Model II, we added women's education and couple educational homogamy variables. Adding these variables did not change the relationship between survey year and consanguineous marriages. The results indicate that women with primary and secondary education tend to have fewer children than women with no formal education ($\beta=-0.36$ & $\beta=-0.45$ respectively).

Similarly, women in a hypogamous relationship are likely to have fewer children than women in which both partners have the same level of education ($\beta=-0.29$).

In Model III, we added various socio-demographic controls. The direction and significance of the relationship between main variables of interest remain the same though the substantial reduction in the magnitude of the coefficient is observed. The effect of time, consanguinity, and female education are much smaller though significant in the entire model. Our analysis shows that older women tend to have more children. Contrary to expectation, urban women are significantly likely to have more children than rural women. Experience of child loss significantly influences mean fertility. More precisely, women who experience child loss tend to have more children than women who had not experienced any child mortality. Overall, Model III shows that differentials in fertility are mainly driven by reproductive compensation for child loss.

DISCUSSION

Consanguineous marriages are a less researched area in the demography though it is prevalent in most parts of the world. The practice of consanguineous unions is common in Pakistan. Around 50 percent of the marital unions are among first or second cousins. Despite the high prevalence of cousin marriages, only a few studies have looked at the socio-demographic dynamics of consanguineous unions (Afzal, Ali, and Siyal 1994; Hussain and Bittles, 1999, 2004). Most of the studies are either dated, localised, or looked at the biological consequences of consanguineous marriages.

In the first part of the study, we examined the change over time in consanguineous marriages and its relationship to women's own education and spousal educational homogamy. Overall, the results show that the pattern of consanguineous marriages remains stable over time, with almost half of the women married to their cousin from 1990-2018. The multivariate analysis also shows that even after controlling for other variables, the consanguineous marriages increase over time by around 30 percent. The same pattern is observed in some other countries such as Yemen (Jurdi & Saxena, 2003; Tfaily, 2005), Turkey (Tfaily, 2005), and Iran (Givens & Hirschman, 1994). Societal changes such as women's education and urbanisation have not led to a decline in consanguineous unions. Literature mentioned various reasons for the high prevalence of cousin marriages in the South Asian context, including financial and social security, strengthening kinship ties, and support in child-rearing (Agha 2016; Hussain, 1999; Lin, Desai, Chen 2020).

We then examined how women's education and spousal educational homogamy are associated with consanguineous unions. We test the hypothesis that with an increase in education, a decrease in consanguinity will be observed because of an increased pool of marriageable men due to their exposure to men outside their families. The findings show that an increase in women's education has led to changes in the marriage market and assortative mating patterns. Since 1990 there has been a substantial improvement in

women's education in Pakistan, reflected in the marriage market. The results also show that women with higher education are significantly less likely to be in cousin marriages than women with no formal education. The findings are consistent with other studies done in similar contexts that educated women are more likely to marry non-relatives than women with no formal education (Assaf and Khawaja, 2008; Hussain and Bittles, 2000; Jurdi and Saxena, 2003; Givens and Hirschman, 1994).

However, we find partial support to our hypothesis 2: consanguineous unions would still be predominately hypergamous in Pakistan, whereas non-consanguineous unions may be shifting towards educationally hypogamous marriages over time. Educational hypergamy persists, and a consistent pattern of educational hypogamy is emerging over time. Though insignificant, the results indicated that hypogamy is positively associated with consanguineous marriages, as found in other studies (e.g., Lin, Desai, Chen, 2020). Though surprising in Pakistan's cultural context, it makes sense. Mostly, marriages in Pakistan are arranged by parents, and women have little say in these decisions irrespective of their education status (Hussain and Bittles, 1999). Similarly, as evident from results, despite the increase in women's education, trends of consanguineous marriages remain unchanged in Pakistan. This norm significantly reduces the pool of marriageable men, and given the universal nature of marriage, "marrying men with lower education could be more of a necessity" (Lin, Desai, Chen, 2020).

The results indicate that hypergamy is more prevalent in cousin marriages. The reason for this could be that though women's education has improved in Pakistan in the last three decades and more women are entering into higher education institutions, still they are a select few. The gender gap in education persists in Pakistan. In general, women are far behind men in Pakistan in terms of the education level achieved. Moreover, education alone may not change the marriage market pattern; women's participation in the labour force may change the dynamics of consanguinity. In our sample, less than one-fifth of the women were in the labour force. Female labour force participation, in general, is low in Pakistan, even for those with higher education.

Similarly, we also observed that women living in urban areas are less likely to marry a cousin than their rural counterparts, as found in other studies (Hussain and Bittles, 2004; Tfaily, 2005; Assaf and Khawaja, 2008). It has been claimed in other studies that working women, especially in professional or higher status jobs, are more likely to be non-consanguineous unions because of exposure to and availability of a potential large marriageable pool of men (Sathar and Kazi, 1988; more reference please). However, the reverse relationship is observed between women's labour force participation and consanguinity. Women in the labour force have higher odds of marrying a cousin.

In the second part of this paper, we looked at how fertility behaviours, namely contraceptive use and CEB, are influenced by consanguineous marriages. Analysis reveals that contraceptive use has increased over time. Moreover, as expected and observed in other studies, contraceptive use is 20 percent lower among women in cousin marriages than non-cousin marriages. As observed earlier, consanguineous marriages are more common among rural couples, women with no formal education, women marrying

at younger ages, and those who experience child loss. All these factors are associated with lower use of contraception (Hosseini-Chavoshi, Abbasi-Shavazi, & Bittles, 2014; Islam, 2013; Hussain and Bittles, 1999).

We found an inverse relationship between the mean fertility (so far) and cousin marriages. Women in consanguineous marriages are likely to have fewer children than women in non-consanguineous marriages. This result contradicts the studies that found higher fertility in consanguineous unions as a replacement strategy among parents for child mortality. However, Hussain and Bittles (1999) found a similar result when it comes to Pakistan. They argue that this may result from “random under-reporting of fertility figures or some misclassification of women by consanguinity status” (Hussain and Bittles, 1999, p.136). In terms of education, we found that educated women, particularly women with primary educations, are significantly likely to have fewer children than women with no formal education. Further, we document that mean fertility is lower among hypogamous couples by education.

Overall, the study results show that consanguinity patterns are stable. There is no evidence that the societal changes such as improvement in women’s education and urbanisation over time have not led to a decline in cousin marriages in Pakistan. The study contributes to the existing literature on consanguinity, educational assortative mating, and fertility and provides trends and interlinkages of these social phenomena. The study is particularly relevant to the country’s family planning, education, and gender policies. First, the mean number of children for both women in consanguineous and non-consanguineous unions is still high. Relatively high use of contraceptives has been found in consanguineous unions. As supported by literature, these results draw attention to poor pregnancy outcomes in consanguineous unions and overall high infant mortality in Pakistan. There is a need for national commitment at policy and implementation levels to ensure that all pregnant women—particularly those medically or economically vulnerable—receive high-quality prenatal and postnatal care.

Second, the study’s findings also indicate that without a substantial social change, the decline in fertility seems non-promising. The cultural preference for consanguineous unions are untestable, as the country has a weak institutional support for child care, or for women who experience family conflicts, separation or divorce. Moreover, expansion of education, particularly in the context of the gender gap, is not enough; participation of young women in formal job market is a condition. Until the opportunity cost of having children for women is not high, a shift in fertility behaviour cannot be observed. The formal job market raises the opportunity cost for women and also exposes them to a more marriageable pool of men with modern family ideals. Similarly, a shift from family support to institutional support in terms of child care could be one major step in encouraging the participation of women in the job market, hence, directly or indirectly raising the opportunity cost for having more children. Availability and accessibility of educational opportunities, women labour market participation, institutional support for child care, parallel attention to demand-side factors in family planning programs may lead towards a desirable social change in Pakistani society.

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