THE EFFECT OF POLYGYNY ON FERTILITY IN THE UNITED ARAB

EMIRATES, 1999

A Dissertation

by

WADHA SAEED KHAMIS ALNUAIMI

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

MAY 2009

Major Subject: Sociology

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Approved by:

Chair of Committee, Dudley L. Poston, Jr.
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ABSTRACT

The Effect of Polygyny on Fertility in the United Arab
Emirates, 1999. (May 2009)

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An important question in the analysis of fertility is
does the type of marital union matter? Is women's fertility
affected by their marital union type? Does being in a
monogamous or polygynous union have any effect on the
number of children women will have? What is the nature of
this difference? Does the social setting play a role? And,
what kind of role does it have? Most studies, especially
those based on African societies, where polygyny is most
prevalent, note that female fertility is negatively
associated with polygyny. This dissertation examines the
polygyny-fertility relationship among married women in a
different social setting, namely in an oil-rich country,
that is, the United Arab Emirates.

Using data from the 1999 National Family Survey for the Characteristics of the Native Households in the UAE, I was able to examine the effect of fertility using two statistical methods to model my dependent variables: Logistic Regression and Negative Binomial Regression.

My findings show that when controlling for numerous biological and social variables, polygyny has a positive effect on women's current fertility, which is the likelihood of having a baby in the past 12 months, but a negative effect on women's cumulative fertility, which is the children ever born to them. However, when the number of wives in the union was introduced into the models, polygyny effect on women's current and cumulative fertility has disappeared, i.e., polygyny no longer has a significant effect on women's fertility.

I discuss the implications of these findings for UAE national policy to increase the fertility of UAE women, an important consideration given that UAE nationals comprise only 20 percent of the UAE population in 2005.

DEDICATION

This dissertation is dedicated to:

My father,

for all the trust, sacrifices, encouragement, prayers, and advice he has given me, for which I'm forever indebted.

My mother,

whose sincere love, prayers, sacrifices, hope, and support made this dissertation possible;

My brothers and sisters,

for their encouragement and support in numerous ways;

My cousins,

whose help and support made my dream come true;

My husband,

whose love, endurance, patience, inspiration and endless support made my graduate studies possible;

My daughters,

for the unlimited joy and happiness they brought to my life.

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Further, my hearty gratitude and deep appreciation go to my parents, brothers, sisters, cousins, parents-in-law, and friends for their sincere prayers, continuous support, and constant love.

Last but not least, I would like to thank my husband, Saeed Abdulla. His love and endless support leave me speechless.

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CHAPTER I

INTRODUCTION

An important question in the analysis of fertility, one of the main demographic processes, is does the type of marital union matter? Is women's fertility a consequence in any way of their marital type? Does being in a monogamous or polygynous union have any effect on the number of children women will have? What is the nature of this difference? Does the social setting play a role? And, what kind of role does it have?

These questions and others need to be answered from a demographic standpoint. Indeed, most the studies on polygyny prevalence and intensity, the characteristics of men and women in polygynous unions, and the effects of polygyny on fertility, come from anthropological literature. However, since the 1950s, there has been increased interest among demographers in polygyny as a form of union that might affect one of the main demographic processes they study, that is, fertility.

_____

This dissertation follows the style of *American Sociological Review.*

Polygyny, a form of union in which a man is simultaneously married to more than one wife, is widely practiced in Africa, in some lowland South American societies, and in the Middle East. The proportion of polygynists varies widely around the world; the highest is among sub-Saharan nations. The Demographic Health Surveys (DHS) _ 1993-1996 showed that the percentages of women in polygynous unions range from around 19 per cent in Zimbabwe to around 50 per cent in Guinea (Timaeus and Reynar 1998).

Among Muslim Arabs, contrary to popular belief, polygyny is not widespread and is, in fact, relatively low by "world standards" (Chamie 1986; Tabutin and Schoumaker 2005). Usually no more than 19 per cent of marriages in Arab societies are polygynous, and in some instances its prevalence is between 3 and 5 per cent, for instance, in most North African countries, Palestine, and Syria (Tabutin and Schoumaker 2005). Examining the impact of polygyny on women's fertility might help policymakers respond to issues of population policy in many Muslim Arab societies.

There are many demographers who have sought to examine the polygyny impact on women's reproductive behavior and to uncover social explanations for such behavior. Their analyses have been undertaken in many African societies, in

some lowland South American societies, in some Mormon communities, in some non-Arab Muslim societies (e.g., in Bangladesh), and in some Arab non-Gulf Muslim societies (e.g., in Jordan and in Morocco). But, to my knowledge, there has not been any analyses conducted in any of the Arab Gulf Muslim societies about the effects of polygyny on the reproductive behavior of the Gulf women.

Therefore, this dissertation will be the first study conducted in a Gulf country investigating the effect of polygyny on fertility; the focus will be on the United Arab Emirates (UAE). The aim is to examine whether the type of marital union (being in a monogamous or polygynous union) has an independent effect on fertility and fertility related behavior, and how marital type union affects fertility. Thus, is it true, like many people believe and suggest, that multiple wives of a polygynist produce more children than a wife of a monogamist and, therefore, polygyny is good for societies in need of increasing their numbers to ultimately secure their representation and identity? This is certainly the situation in the UAE society where nationals comprise no more than 20 per cent of the total population of the country, an issue known as the demographic imbalance problem. Could increasing

polygyny prevalence among the nationals produce more children? Would this be one of the solutions for the demographic imbalance problem facing the UAE nationals today?

Indeed, the effect of polygyny on fertility behavior is a complex relationship. Similar to other sociological and demographic relationships, it can not be satisfactorily addressed in a single study. As I will show later, there is no consensus regarding the direction of the relationship; some show that it is negative, others that it is positive; and still others that there is no relationship. Moreover, most of the literature has focused on Africa, partly because it has the highest prevalence of polygyny worldwide. But there is a need to examine the effect of polygyny on fertility behavior in different social settings and ascertain whether an analysis in a different social context results in a different or similar outcome. There is also a need to examine the mechanisms through which polygyny affects fertility. This dissertation addresses the questions raised above.

The central goals of this dissertation are: 1) to model the relationship between type of marital union and the occurrence of a birth during the last 12 months; 2) to

model the relationship between type of marital union and the number of children married woman will produce; and 3) to examine the mechanisms through which these polygyny-fertility relationships occur.

This dissertation explores the relationship between polygyny and whether an Emarati woman had a birth in the last 12 months and the number of children ever born (CEB) for Emarati women. If the type of marital union is influential in determining woman's fertility, then there will be an association between whether a woman is polygynous and her CEB and whether she had a birth during the last 12 months.

In CHAPTER II, I review the relevant literature about the effect of polygyny on women's fertility behavior. This include concepts, polygyny in theology and practice, the prevalence and intensity of polygyny, polygyny functions and characteristics of men and women in polygynous union, and the theories about the relationship between polygyny and fertility.

In CHAPTER III, I discuss the history, demography, and the social context of the study site, the society of the United Arab Emirates (UAE). This discussion includes a comparison of the UAE with other Arabian Gulf countries.

Since most analyses of polygyny and fertility have been conducted in African countries, this discussion of the social context of the UAE helps set the stage for my quantitative analyses.

In CHAPTER IV, I discuss the data and methods I use. I estimate two different types of regression models, Logistic Regression and Poisson Regression/Negative Binomial Regression. I also provide an operationlization and description of the dependent variables and independent variables. The chapter also includes a description of the characteristics of the sample used in the analysis, that is, the married Emarati women, and their education, employment, residence, duration of marriage, husband's age, education, and employment. In each chapter, the dependent variables are reviewed.

In CHAPTER V I discuss the characteristics of ever married women as demonstrated in the descriptive results of the *National Family Survey for the Characteristics of the Native Households, 1999 (*the survey I am using for this study), followed by characteristics discussion of the population under study, namely, the characteristics of married Emarati women who are only married once and that of their husbands.

CHAPTER VI examines the effect of polygyny on the occurrence of a birth during the last 12 months. Logistic Regression is used in this analysis because the occurrence of a birth is a binary variable.

CHAPTER VII examines the effect of polygyny on the children ever born (CEB). Negative binomial Regression is used because CEB is a left skewed count variable and has a significant overdispersion.

CHAPTER VIII discusses the results of the previous chapters and points to further research needed. The implications of this research are discussed, especially those having to do with UAE population policy.

CHAPTER II

LITREATURE REVIEW

This chapter reviews and discusses previous studies that examine the effect of polygyny on female fertility. I organize the chapter around several themes: Concepts; polygyny in theology and practice; the prevalence and intensity of polygyny; polygyny functions and characteristics of men and women in polygynous union; and finally the theories and studies on the relationship between polygyny and fertility.

CONCEPTS

When talking about polygyny, different concepts need to be clearly defined; they are:

1) **Monogamy** which refers to the marriage structure in which there is one spouse at a time. It is the practice of each married person to have only one spouse;

2) **Polygamy** which is a term denoted to mean the marriage structure in which there is more than one spouse at a time. However, some writers appear to use polygamy to mean marriage of one man with two or more wives, which should properly be termed polygyny (Marshall 1998)

Polygamy can also be classified into two types of unions. The first, and the more common type of polygamy, is **polygyny**, which is, as mentioned above, a marriage structure in which a man is simultaneously married to more than one wife. The second type of polygamy is **polyandry** in which a woman is simultaneously married to more than one husband. The latter is a rarely encountered form of marriage, and usually occurs when a woman is married to two or more brothers to maintain the land and property within one family; this is because inheritance passes to the children, who are all regarded as being offspring of the same father(s) (Marshall 1998).

POLYGYNY IN THEOLOGY AND PRACTICES

Polygyny has been practiced in many populations throughout history. Many cultures have accepted polygyny at one point in time. It was accepted in ancient Hebrew society, in ancient China, in East Asia, in ancient Greece, in the early history of Mormons (The Church of Jesus Christ of Latter-day Saints), in sub-Saharan Africa, and in Muslim countries.

This section of the chapter will focus only on Islam and the law of the Muslim countries regarding polygyny.

Unrestricted polygyny was practiced in pre-Islamic Arabia. There were no limitations on the number of wives men could marry. The new law under Islam- the *Shari'a*-reformed marital practices, but did not abolish polygyny. The *Shari'a* accorded women a number of rights that did not previously exist in pre-Islamic Arabia, and thus changed marriage from an institution characterized by unquestioned male superiority to one in which the man was a desired and completing partner (Khadduri 1978). For example, the dowry was considered previously as a bride-price paid to the bride's father, but after Islam it became a nuptial gift retained by the wife as part of her personal property (Khadduri 1978).

The *Shari'a* also transformed the nature of marriage from being a "status" to being a "contract" with several essential elements (Khadduri 1978), as follows: an offer of marriage by the man through a woman's father (or an entrusted representative, in case of the death of her father), an acceptance by the woman, and the performance of such conditions as the payment of the dowry in the presence of at least two witnesses for marriage contract.

In theory and according to *Shari'a*, polygyny is permissible under three essential conditions: 1) the man

cannot have more than four wives simultaneously; 2) he must possess the financial means to support more than one wife; and 3) he must treat and give attention to each wife equally.

In practice and according to laws relating to practices of polygyny in Muslim countries, there are three types of laws (Khadduri 1978; Chamie 1986):

1) Polygyny **is strictly prohibited:** Two countries have applied this law, namely, Turkey since 1926, and Tunisia since 1956 (Tabutin and Schoumaker 2005). Both countries have completely or partially abolished the *Shari'a* and have adopted a secular law.

2) Polygyny **is permitted subject to specific judicial restrictions:** Most of the Middle Eastern Muslim countries apply this law, especially Morocco, Syria, and Iraq. For these countries that apply such law, *Shari'a* is followed in principle, but has pursued an evolutionary course by trying to adopt it to modern living conditions. In Morocco, for example, the wife has the right to insert into her marriage contract a condition that forbids the husband to marry another wife; violation of this agreement, gives the wife cause for divorce. In case there is no such clause in the

contract, the wife is entitled to receive compensation for the second marriage.

3. **Polygyny is permitted:** Most countries of Arabian Peninsula are in this category. These countries recognize the *Shari'a* as the fundamental law, and they believe that there are no changes needed to its basic principles. Therefore, in these countries, there is little, if any, governmental judicial restrictions applied to those who wish to marry more than one wife.

THE PREVALENCE AND INTENSITY OF POLYGYNY

Before talking about polygyny's prevalence and intensity, I should point to the different ways polygyny is measured. According to Dorjahn (1959) and Van de Walle (1968), measuring polygyny should be basic to test any hypothesis related to the demographic aspects of polygyny. The rational behind this is to assign numerical values to this phenomenon in order to have a clearer understanding of the frequency and extent of polygyny in a society. To examine the degree of polygyny in a society or among a certain group, demographers usually use three different types of measures (Van de Walle 1968; Timaeus and Reyndar 1998; Welch & Glick 1981):

1) **Incidence or prevalence of polygyny,** which refers to the frequency of polygyny in the population. It is measured by the number of polygynists per 100 married men. Usually when the incidence exceeds 20 per cent, the population is described as being characterized by general polygyny. When the incidence is below 20 per cent, the population is described as being characterized by limited polygyny (Clignet 1970);

2) **Intensity of polygyny** refers to the size of polygynous households. It is measured by the number of wives per 100 polygynists;

3) **The general Index of polygyny** refers to the polygyny ratio, or the ratio of currently married women to currently married men in the population, and it is measured by the number of married women per 100 married men. It can also be measured by the number of wives per number of husbands (Van de Walle 1968; Timaeus and Reyndar 1998; Welch & Glick 1998).

As previously mentioned, polygyny is found to be widely practiced in Africa, in some lowland South American societies, in the Middle East, and in the early history of Mormons in America (i.e. the Church of Jesus Christ of

Latter-Day Saints) who generally recognized the practice of polygyny between 1842-1890 (Bean & Mineau 1986).

Also, the proportion of polygynists varies around the world. Among Muslim Arabs and in the Middle Eastern region, polygyny has never been a dominant marriage system and is showing clear signs of decline in some societies (Tabutin and Schoumaker 2005). Thus, contrary to poplar belief, polygyny is not widespread among Muslim Arabs and is, in fact, relatively low by "world's standards" (Chamie 1986; Tabutin and Schoumaker 2005). Usually no more than 19 per cent of marriages are polygynous in Arab societies, and in some instances its prevalence is between 3 and 5 percent, for instance, in most North African countries, Palestine, and Syria (Tabutin and Schoumaker 2005); and substantially higher (around 8 to 19 per cent) in the Arabian Gulf countries. Conversely, the levels of polygyny among non-Arabs are between 19 and 50 per cent in some sub-Saharan nations according to the data from Demographic and Health Surveys 1993-1996 (Timaeus & Reynar 1998).

These polygyny percentages for sub-Saharan nations were noticeably different when Dorjahn (1959) reviewed early data on 155 societies in sub-Saharan Africa. He found that the proportion of married men who were polygynous ranged

from 4 per cent to 91 per cent, with an overall mean of 35 per cent.

Table 1 draws on data from previous studies and shows the prevalence of polygyny in different societies. According to the Demographic and Heath Surveys (DHS) 1993-1996, Guinea (around 50 per cent) had the highest percentage of currently married women in polygynous unions, Mali was next (44.3 per cent), and Zimbabwe was the last (19 per cent) (Timaeus & Reynar 1998).

As previously mentioned, the prevalence of polygyny in Arabian Gulf societies (Saudi Arabia, UAE, Kuwait, Qatar, Oman, and Bahrain) is higher than anywhere else in the Middle East. According to the 2000 Gulf Family Health Surveys, of all currently married women aged less than 50, 19 per cent of Saudi women were in polygynous unions; it is a comparable percentage with some African societies, such as Zimbabwe. UAE had the second highest percentage of currently married women in polygynous unions (14.5 per cent), Oman was the third (11 per cent), Kuwait was the fourth (9 per cent), and Bahrain and Qatar were the last (8 per cent).

In some lowland South American societies, among Shipibo, for example, the rate of polygynously married men is 7.1

per cent, with 9.8 per cent of all women of reproductive age (aged 15+ years) in polygynous union, and as high as 50 per cent found to be polygynously married men among the Yanomama families (Hern 1992). Among Mormons, at its highest, polygyny was practiced by a minority of not more than 10 per cent (Smith and Kunz 1976).

Regarding the intensity of polygyny, almost 90 per cent or more of polygynous Arab Muslim males have two wives (Chamie 1986). In the United Arab Emirates, around 6.0 per cent of married national men were polygynists in 1975 (compared to 11.5 per cent among nationals in Kuwait), and 92.7 per cent of them had two wives (Chamie 1986). According to data from the 1999 National Family Survey of the UAE (the dataset I am using in my dissertation), 13.4 per cent of currently married national men are polygynists, and almost 82 per cent of them are married to two wives.

Table 1. Prevalence of Polygynous Marriages in Previous Studies

Population	Polygynous Marriage %	Reference
Arab Countries		
Lebanon[a] 1971	3.7	Chamie (1986)
Jordan(East Bank only)[a]1979	7.5	Chamie (1986)
Algeria[a] 1966	1.8	Chamie (1986)
Egypt[a] 1960	3.8	Chamie (1986)
Libya[a] 1973	3.3	Chamie (1986)
Morocco[a] 1952	6.6	Chamie (1986)
Syria[a] 1976	1.9	Chamie (1986)
Iraq[a] 1960	3.8	Chamie (1986)
Yemen[a] 1975	4.5	Chamie (1986)
Arabian Gulf Countries		
UAE[a] 1975	6.0	Chamie (1986)
UAE 1999	13.4	1999 National Family survey
UAE 2000	14.4	2000 GFHS[b]
Kuwait[a] 1965	6.7	Chamie (1986)
Kuwait[a] 1970	8.8	Chamie (1986)
Kuwait[a] 1975	11.7	Chamie (1986)
Kuwait 2000	9.0	2000 GFHS[b]
Bahrain[a]1981	5.4	Chamie (1986)
Bahrain 2000	8.0	2000 GFHS[b]
Qatar 2000	8.0	2000 GFHS[b]
Oman 2000	11.0	2000 GFHS[b]
Saudi Arabia 2000	19.0	2000 GFHS[b]
Muslim Countries		
Matlab, Bangladesh	4.9	Shaikh et al. (1987)

Table 1. Continued

Population	Polygynous Marriage %	Reference
African Countries		
Zimbabwe[c]	18.6	Timaeus& Reynar (1998)
Kenya[c]	19.5	Timaeus& Reynar (1998)
Uganda[c]	29.9	Timaeus& Reynar (1998)
Mali[c]	44.3	Timaeus& Reynar (1998)
Guinea[c]	49.6	Timaeus& Reynar (1998)
South American Societies		
Shipibo [a]	7.1	Hern, 1992
Cashinahua families [a]	27	Hern, 1992
Yanomama [a]	50	Hern, 1992
Among the Mormons	Not more than 10%	(Smith & Kunz, 1976)

[a] The Prevalence rate was calculated based on male subjects

[b] 2000 Gulf Family Health Surveys(Mohammed 2003)

[c] The study cited data from the Demographic and Health Survey based on percentage of women in polygynous marriages.

POLYGYNY: ITS FUNCTIONS AND CHARACTERISTICS OF MEN AND WOMEN IN POLYGYNOUS UNION

The Functions of Polygyny

One should understand that polygyny is considered as a functional part of the functioning whole in the preservation of the family and lineage (Hillman 1975; Kolmegah 1997), especially in patrilineal kinship systems in which polygyny is found to be more prevalent than in matrilineal kinship systems (Timaeus and Reynar 1998). Thus, in traditional societies a large number of children is needed to ensure the continuity of the family line through male heirs. In the polygynous family, as some demographers have pointed out, the total number of children born (by all wives together) exceeds the total number of children born in monogamous families; this is one of the main demographic and cultural reasons for polygyny (Muhsam 1956). Therefore, polygyny is most common among hunters or in pastoral societies like that of the Bedouin, if they are patrilineal and the wealth and power of the family is the main social goal of the individual, as well as if both wealth and power can be secured through raising the number of its members (Muhsam 1956).

Also, polygyny is found in societies of subsistence food production where a large number of children is needed to provide labor for the family and to ensure the presence of children because the average rate of child mortality is usually very high (Kolmegah 1997).

Moreover, polygyny is found in societies where children are valued not only for their labor, but also for their emotional support and old-age security for their parents (Kolmegah 1997). Thus, in a society where the desire for many children is the highest concern of spouses, the practice of polygyny is socially acceptable and is often considered the surest means of achieving societal ideal goals (Kolmegah 1997). Furthermore, children in these societies are considered as a symbol of importance and success in life. Since socio-economic security and family stability in traditional societies usually depend on the number of children in the household, it seems that polygynous households are desirable in such societies.

Polygyny is also found to be more prevalent among Muslim groups than among Christian groups in the same population (such as in Africa) (Timaeus and Reynar 1998.) This family type is also less prevalent in societies where more adult women are literate (Timaeus and Reynar 1998). In general,

in polygynous societies, marriage tends to be universal, female age at marriage tends to be early, and women tend to remarry early after divorce or widowhood (Lardoux and Van de Walle 2003).

In summary, Radcliffe-Brown and Forde (1960) proposed three basic reasons for the persistence of polygyny, especially in Africa: 1) to obtain and demonstrate social status. Thus, historically, men who were able to acquire additional wives found themselves in a more advantageous position, and having once achieved such a position they were expected to take more wives than men of lower status; 2) to secure an appropriate labor force, especially sons who are needed to expand the family's labor force. In the partrilineal system of kinship, girls are regarded as liabilities because as soon as they marry- and they marry early- they move into the husband's home, while sons are considered to strengthen their families by marriage (Chojnacka 1980); and 3) to fulfill sexual necessity since intercourse during pregnancy and the post-partum period is frequently forbidden by customs and taboos in some societies. For example, after the birth of a child, the mean period of postnatal abstinence in Ibadan (Nigeria) is around 22 months: 24 months for women in polygynous

marriages versus 20 months for women in monogamous marriages (Ware 1975).

Furthermore, polygyny is motivated by the need for alliances between extended families and clans, in other words, "polygyny is a function of social solidarity on the level of the extended family, the clan and the tribal or ethnic community" (Hillan 1975: 117-18).

Finally, some argue that polygyny might well influence the population growth rate by producing more children. However, Chojnacka (1980) stresses that "the major demographic consequences of polygyny is reflected in the very young nuptiality pattern for women which directly affects the rate of population growth" (1980: 106). Thus, what affects population growth might not be the polygyny prevalence by itself, but the fact that women in polygynous marriages marry at young ages and therefore produce more children in the population than women in monogamous marriage.

Characteristics of Men and Women in Polygynous Marriages

The type of marriage women and men choose to enter is to a great extent determined by their personal

characteristics, their economic, social, and cultural environments, and by the opportunities they encounter.

Studies have shown that the characteristics of men and women who enter a polygynous union are as follows:

First: Age

There is a general consensus in the literature regarding the age difference between women in polygynous and monogamous unions, and regarding the age difference between polygynists and their wives. Chojnacka (1980) shows that age at first marriage is lower among polygynous than monogamous couples for both husbands and wives. Monogamous wives marry about one to two years later than polygamous wives. The mean ages at first marriage are between 15-21 and 22-27 years for women and men respectively (Chojnacka 1980). However, it is not surprising that she shows that the difference in age between spouses at first marriage is similar in both types of unions; it ranges from 8 to 10 years, and widens in polygamous unions for each additional wife (Chojnacka 1980). Thus, the first wives in polygynous union share similar average age of monogamous wives because first wives of polygynists were monogamous wives for some time before their husband decided to marry another wife or wives; they have a wider age difference between them and

their husbands. This was confirmed by Varea and colleagues (1996) when they showed that polygynous marriages are characterized by great age difference between spouses (around 15 years) in Marrakech (Morocco).

However, Muhsam's (1956) study of the Bedouin of Negaeb shows that, on average, first wives of polygamous husbands are much older (median age 40 years), and second wives somewhat younger (median age 28 years) than only wives of monogamous husbands (median age 32 years).

In fact, the type of union is not the only factor that determines the age at first marriage; there are other factors such as the level of education. Chojnacka (1980) shows that age at first marriage is positively related to the level of education of both the husband and wife. A clear-cut tendency appears; "The higher the educational attainment the later the age at first marriage among polygamous and monogamous couples alike" (Chojnacka 1980: 104).

Moreover, as young single women tend to be more attractive brides than divorcees, widows, and women who remain single until an older age, these young single women are more likely to become higher-order wives than a man's first partner (Timaeus and Reynar 1998).

Second: Education

Generally more educated men and women are more likely to enter monogamous unions (Ohadike 1968; Chamie 1986; Shan 2004). Also those who are having modern education are less likely to enter polygynous marriages than the uneducated (Chojnacka 1980; Shaikh, Aziz, and Chowdhury 1987; Brown 1981; Chamie 1996; Timaeus and Reynar 1998).

However, Timaeus and Rydnar (1998) posit that women who have achieved a high level of education, and remained single into their twenties or thirties, might well have acquired a strong preference for a monogamous marriage. But their older age and, perhaps, their increased level of education, could well make them less attractive prospective wives for single men. Thus they may be unable to realize their preference for a monogamous marriage and thus accept a proposal from a polygynist (Timmaeus and Reynar 1998).

Third: Religion

Some studies show that among different believers in a population, the rate of polygyny tends to be higher for both traditional believers and Muslims than for other believers. For example, in Nigeria, a study by Kolmegah (1997) found that the percentages of polygyny were 47.2 per cent for Muslims and 37.5 per cent for traditional

worshippers, compared to 23.3 per cent for Protestants and 17.3 per cent for Catholics. Chojnacka (19980) and Timaeus and Reynar (1998) also report these findings in various African populations.

Fourth: Residence

As suggested by many sociologists and demographers, urbanization and industrialization are processes that tend to weaken the traditional extended family systems and lower the process of polygyny through two of the most powerful agents of Westernization: schooling and the exposure to mass media (Caldwell 1980). Thus, the degree of access to education, to the media, and to the consumption of western goods often determine the matrimonial preferences (Timaeus and Reynar 1998). Therefore, one expects to find polygyny to be more prevalent in rural areas compared to urban areas where both schooling and the exposure to mass media are more prevalent. Also because of the high cost of living in urban areas, housing shortages and financial difficulties, one would expect polygyny to be less prevalent in urban areas than rural areas (Caldwell 1975). Furthermore, urbanization and industrialization have brought social change to societies through increasing girls' access to education, media, and western culture; they have also

lessened the practice of postpartum abstinence; all of this contributes to a decrease in the practice of polygyny in urban areas. Accordingly, more women in urban areas are likely to be in monogamous marriages than in polygynous marriages. In Ghana, for example, 75.2 per cent of wives in urban settlements are monogamous, whereas only 24.8 per cent of them are polygynous. In the rural settings, 65.5 per cent of wives are married to monogamists, versus 34.5 per cent of them married to polygynists (Kolmegah 1997).

Fifth: Duration of Marriage

Polygyny is more likely to increase with marital duration (and therefore age) among both men and women (Ohadike 1968; Timaeus and Reynar 1998).

Sixth: Occupation

Many studies in various populations show a relationship between polygyny and occupation. Some studies in Africa show that polygynous marriages prevail among farmers, traders, and manual workers; and they are less frequent among non-agricultural, non-manual workers and professionals (Chojnacka 1980; Timaeus and Reynar 1998). Also, Shaikh and his colleagues' (1987) study in Bangladesh show that there is a tendency for farmers in rural areas

and wealthy businessmen in urban areas, to marry a second wife for the purposes of domestic and farm help.

Chamie's (1986) study of Arab societies also shows that among Arab Muslim populations, the proportions of polygynously married men are highest among the financially better-off (who are not necessarily the most educated), and are lowest among those in occupations requiring most formal education, i.e., professional and technical occupations, and among those who are in relatively less lucrative occupations, requiring little formal education, i.e.; clerical, service, and associated occupations

Moreover, not only does a man's occupation have an effect on whether he is polygynous; also the wife's parent's occupation might influence the chances of marrying a polygynist. Ahamd's (1986) study of the Yoruba (Nigeria) finds that the higher the occupational levels of the woman's parent, the less likely she will be married to a polygynist.

Seventh: Infertility

Some studies indicate that infecund women may be less likely to be monogamously married and more likely to end up as first wives in polygamous marriages (Chojnacka 1980; Chamie 1986; Timaeus and Rydnar 1998; Mulder 1989). Varea

and colleagues (1996) also found that polygynous marriages in Marrakech are characterized by a significant increase in childless women and women who were previously married. They also found that the sterility of the first wife favors the inclusion of a second wife into the union, and that it is the divorcees and the widows who mostly enter already established marriages.

Eight: Wealth

The intensity of polygyny is greater among wealthy men and those who are financially better- off (Chamie 1986; Shan 2004). Also, rich men tend to engage in more polygynous unions in societies where the payment of bridewealth is the common practice (Timaeus and Reynar 1998). One of the reasons is that rich men are more able to meet the wedding expenses and the costs of providing for multiple houses than are non-rich men. Others suggest that polygyny is higher among wealthy men not because they are more likely to take additional wives but because their wives are less likely to divorce them (Ohadike 1968; Brown 1981; Timaeus and Reynar 1998). Thus, men's increased wealth is a cause and a consequence of polygyny (Lardoux and Van de Walle 2003).

THEORIES OF POLYGYNY AND FERTILITY

There are three principle theories about the relationship between polygyny and fertility behavior. I will discuss each of them.

First: Sexual Competition Model

This model is a biological explanation of the fertility differential between polygynous and monogamous wives. It presumes that the lower fertility among both polygynous women and higher-order wives is due in part to the presumed reduction in coital frequency of each woman, as the husband must divide his time among all his wives, presumably increasing sexual competition and decreasing the risk of pregnancy for each wife (Muhsam 1956). Also the addition of another wife may involve the establishment of a separate place of residence for the new wife, sometimes at a great distance from the others, further reducing the frequency of sexual intercourse for the more distant wife (Muhsam 1956; Bean and Mineau 1986).

There are numerous analyses in the literature showing this negative relationship between polygyny and fertility (Musham 1956; Ivins 1956; Dorjahn 1958;Van de Walle 1965; Henin 1969; Page 1975; Ukaegbu 1977; Brown 1981; Farooq 1985; Bhatia 1985; Shaikh et al. 1987;Garenne and Van de

Walle 1989; Hern 1992; Josephson 2002; Lardoux and Van de Walle 2003). Several factors have been shown to account for the fertility differential. In their study of Senegal, Garonne and Van de Walle (1989) argue that husband's age and co-residence status have important effects on this difference. Thus, the fertility of older husbands, especially those aged over 50, seems to be lower due to both lower fecundability and, less so, to lower coital frequency. Also, an important consideration is the separate residence status of many women in polygynous unions. Thus, polygynists' wives usually spend more time separated from their husbands, which tends to lower their fertility.

Second: Favoritism Model

This model provides more of a sociological explanation of fertility differentials than the previous model. It argues that favoritism toward certain wives, or certain types of wives, could reduce the fertility of other wives, irrespective of marriage order, and could also presumably reduce the fertility of the less preferred wives relative to that of their monogamous counterparts (Muhsam 1956; Garenne and Van de Walle 1989). In general, younger wives who are higher-order wives in the union are sexually

preferred. Therefore, they tend to have higher fertility than lower-order wives (Lardoux and van de Walle 2003). This model is more concerned with fertility differences among different kinds of polygynous wives. But it does posit that on average most polygynous wives will have fewer children than monogamous wives.

In their study of rural Senegal, Lardoux and van de Walle (2003) show that after controlling for age and number of wives in the union, wives of higher rank tend to have higher fertility than wives of lower rank. They interpret this finding as evidence of "favouritism" by the husband, resulting in a higher frequency of intercourse with the latest arrival among his wives. Muhsam (1956) also found that second wives had higher fertility than first wives, though not consistently in all age groups. His explanation was that the lower frequency of sexual intercourse may affect both the first and second wives, but most probably affects the first wife more than the second.

Third: Male Demand for Progeny

This model states that, on average, polygynous wives should have more children than monogamous wives. It argues that men marry additional wives mainly to satisfy their desire for a large number of progeny (Muhsam 1956;

Chojnacka 1980; Ukaegbu 1981). Thus, one of the main reasons for men to have multiple marriages is to have many children (Blance and Gage 2000). However, the fertility of more recent wives may be affected by a declining demand for children as the stock of progeny by earlier wives saturates both the demand for children and the ability to provide for offspring (Anderton and Emigh 1989). Thus, many studies show that higher-order wives tend to have fewer children than lower-order wives (Ukaegbu 1977; Smith and Kunz 1976; Sween and Clignet 1978; Bean and Mineau 1986; Anderton and Emigh 1989; Josephson 2002).

Ukaegbu (1977) explains this fertility differential by the age disparity between the polygynists and their wives. Polygyny reduces fertility through the intermediary of a comparatively wider age differential between polygynists and their wives. Anderson and Emigh (1989) indicate that the fertility of earlier wives is largely determined and affects the continuing fertility of more recent wives. In other words, the fertility of all wives will decline, not as additional wives are taken but as the stock of children born to all wives reaches some limit of demand or of capacity to provide for offspring.

Regardless of who will have more children, the lower-order wives or the higher-order wives, the end result is that on average polygynous wives will have more children than monogamous wives (Sembajwe 1979; Arowolo 1981; Sueyoshi and Ohtsuka 2003).

There are also other studies that show a marginal, if slight, differential in fertility between the women in polygynous and monogamous unions (Ohadike 1968; Pool 1968; Olusanya 1971; Seetharam and Duza 1976; Chojnacka 1980; Logue 1984; Ahmed 1986; Sichona 1993).

Other studies have criticized the polygyny and fertility hypothesis. They have argued for a need to re-evaluate the hypothesis. Bean and Mineau (1986), for example, argue that the comparison of the fertility of polygynous wives with monogamous wives is inappropriate. They suggest that fertility will vary by wife-order in multiple-wife families, especially when replacement of infertile (childless) first wives is not a main motive for polygyny and when there is equitable treatment of multiple wives. Also several studies have found that the fertility of first-order wives is not at all different from that of monogamous wives, but being a second or a third-wife will depress fertility (Smith and Kunz 1976). Furthermore,

fertility tends to decrease with the increase in the number of wives in the union (Lardoux and Van de Walle 2003).

Mulder (1989) also argues that in order to conclude that the low fertility of polygynously married women is a consequence of their marital status, one must rule out a number of alternative explanations: One is that there must be no evidence of a selection process though which women of low reproductive potential, especially those who are infertile, are more likely to be found in polygynous marriage. Second, secular changes, especially those that co-vary with marital status, must be carefully eliminated as the causes of reproductive differences between women in both monogamous and polygynous unions. Furthermore, Varea, Crognier and colleagues (1996), in their study of polygyny and fertility in Morocco, found that differences in female fertility are not determined by type of marriage. The lower fertility of polygynously married women tends more to be due to their greater previous marital instability, a result confirmed by Johnson and Elmi (1989). This reduction of fertility due to previous marital disruption (having married more than once) persists even after controlling for the rest of the matrimonial variables.

Furthermore, Ezeh (1997) and Agadjanian and Ezeh (2000) have argued that polygyny is not an individual-level variable; therefore, its impact on fertility cannot be understood by simply comparing the reproductive behavior of monogamously and polygynously women (or men). Thus, being in a polygynous union is not entirely the women's individual choice, at least not for the first wives in polygynous unions. Many forces determine women's odds of being in polygynous union which also affect her reproductive desires. The argument is that the incidence of polygyny in a population could indicate the strength of prenatalism in that population. The gender differences in reproductive desires tend to increase with increasing levels of polygyny. Both Ezeh (1997) and Agadjanian and Ezeh (2000) show that men and women in low-polygyny areas express similar reproductive desires, whereas men in high polygyny areas desire more children, on average, than women in the same regime. Also, their results show that women in areas of high polygyny have higher fertility desires and they adopt behavioral patterns consistent with the achievement of high fertility goal. Thus to achieve their high-fertility goals, women in high-polygyny areas often start their sexual and reproductive activity much earlier

and are more likely to remain in union once initiated. They are also less likely to adopt practices, such as contraception, that lower their fertility. In high-polygynous areas men attain higher fertility goals by marrying multiple wives.

In summary, although there is no consensus in the literature on the effect of polygyny on female fertility, most studies, especially those conducted in Africa, seem to agree that polygyny is usually negatively associated with female fertility. Also fertility is negatively associated with the order of the polygynous wives. Specific studies, however, counter these general findings, which reflect the variety of mechanisms that may be affecting the fertility of polygynous women (Anderson and Emigh 1989; Garonne and Van de Walle 1989). Indeed, there is a need to conduct more studies that examine the precise mechanisms through which polygyny may reduce fertility (Ukaegbu 1977).

This dissertation will take into account some of the criticisms of earlier literature. To avoid some of the methodological problems indicated by several researchers, my dissertation will include two dependent variables to measure female fertility: children ever born; and whether the woman had a birth in the past 12 months. The analysis

in this dissertation will also restrict the sample to currently married women who have been married only once. These restrictions are introduced in my dissertation because many researchers have shown that marital instability (the number of marriages a woman has) affects the number of live births (Varea, et al. 1996; Mulder 1989).

CONCLUSION

Most studies on polygyny's effects on fertility have been conducted in African countries. Very few studies have examined this phenomenon in Muslim and Arab countries. Thus, in Arab countries, to my knowledge, the effects of polygyny on reproductive behavior have been examined only in Jordan and Morocco. No studies have been conducted in the Arabian Peninsula. Also the effect of polygyny on fertility is complex. Similar to other sociological and demographic relationships, it can not be satisfactorily addressed in a single study. As we saw, there is no consensus regarding the direction of the relationship; some show that it is negative, others that it is positive; and still others that there is no relationship. These contradictory findings suggest the need to study the

mechanism through which polygyny may or may not affect fertility.

In the next chapter, I will discuss the social context of the study site, the society of the United Arab Emirates. Since most analyses of polygyny and fertility have been conducted in African countries, this discussion of the social context of the UAE will help set the stage for my quantitative analyses. I will also put forth in the next chapter the hypotheses for my dissertation and the reasons for such hypotheses.

CHAPTER III

UNITED ARAB EMIRATES

This chapter will discuss the history, demography, and social context of the United Arab Emirates. This will include a comparison of the UAE with the demography of the other Arabian Gulf countries (also known as the Gulf Cooperation Council countries (GCC)), that is, with Qatar, Kuwait, Bahrain, Oman, and Saudi Arabia. And finally, I will put forth the four hypothesizes I will later test.

HISTORICAL BACKGROUND OF THE UAE

The United Arab Emirates is located in the Gulf area of Western Asia. Appendix A contains two maps, namely, the Asian region and the UAE; these may be used to locate the UAE geographically. The United Arab Emirates is an oil rich Arab Gulf Muslim country. Oil exportation income, mainly in existence since the early 1950s, has generated a huge transformation in many aspects of UAE political and socioeconomic life as well as the lives of all the GCC countries. The degree of these transformations has been so profound that local writers often distinguish between two eras in their modern history: pre-oil and post-oil (Khalaf and Alkobaisi 1999). The discovery of oil in the GCC

countries has occurred in various decades. Oil was discovered in Bahrain in 1933, in Saudi Arabia in 1938, in Kuwait in 1946, in Qatar in 1949, in UAE in 1962, and in Oman in 1967. Nevertheless, these countries share many similarities in terms of the development of their political and socio-economic structures to the extent that together they constitute a unique societal type specific to this oil-rich region that is different from the developed capitalist industrial societies or those of the developing Third World societies (Khalaf and Alkobaisi 1999). For the UAE, the economic factor, namely, the discovery of oil, was not the only factor that marked the beginning of the modernization of the country. Along with it was another significant factor, a political factor, that marked the beginning of the country's modernization. I refer here to the unionization of the seven individual states of the UAE, referred to as *Emirates,* namely, Abu Dhabi, Dubai, Sharja, Ajman, Ras-Al-khaimah, Umm Al-Quwain, and Fujairah, into a single country on the second of December 1971. This unification has initiated even more changes in all life aspects in the UAE than the discovery of oil.

Before the discovery of oil (prior to 1962), the UAE was a traditional society in its economic and social

structures. The economic structure was based on fishing and diving for pearls, which attracted 85 per cent of the people. Since the 19th century, trading was an important economic activity mainly in the coastal cities. Most of the trade was outside the country, and it was based on exchanges, such as horses, carpets, and seeds for pearls, dates, and dry fish (Helmi 1999). There were also minor agricultural activities which were restricted to the oases.

The social structure of the UAE was a tribal system. A tribal society was based on social classes that varied according to family bloodline, authority and wealth (Al Qasemi 1998). The family structure was based on extended family units (two generations or more living in a same house). Marriages were maintained endogamously (marriage from inside the tribe), especially between parallel cousins (the brothers' children). It was common for people to get married at early ages (as early as age 12) and to have many children (seven and more).

After the discovery of oil and the unionizing of the seven emirates, the most important processes of change were 1) establishing political, financial, educational, and health institutions, and other public facilities; 2) changing the human ecology of the society by transforming

many parts of the desert to urban areas and by creating a multi-ethnic culture within the society itself; 3) increasing rates of internal migration from rural areas to the centers of cities; and 4) importing foreign labor (Arabs and non-Arabs) from all over the world.

According to the Ministry of Planning, the population of the UAE in 2005 is overwhelmingly urban, with more than 83 percent of the people living in cities. The largest city, Abu Dhabi, the federal capital, had a population of 1,399,484 in 2005. Dubai, the second largest city and the UAE's main port and commercial center, had a population of 1,321,453. The residential neighborhoods along the Arabian Gulf coast north of the center of Dubai were contiguous with those of the city of Sharjah (with a population of 793,573). Sharjah in turn flowed into the city of Ajman (with a population of 206,997). The other Emirates had a population of 210,063 for Ras-al-Khaimah, 125,698 for Fujairah, and 49,159 for Umm-Al-Quwain.

Despite there is no federal UAE standard for classifying urban areas, most emirates in UAE are divided into urban and nonurban centers (rural areas), not by population size as in the case of the US, but mostly by how far is the distance from the emirate's city center.

Sometimes that means less municipality services in those rural areas (in USA referred to as "the country" or "the countryside"). They are also large and isolated areas of a country, often with low populations. Figure 25 (in Appendix A) shows the population density of the UAE based on the 1980 Census.

In the economic side, after the discovery of oil, the country set many economic goals that would bring more changes to the society. These goals were to increase foreign investment and to establish new social groups. These social groups include: Civil servants, who were originally working in diving, pasturage, and minor agriculture activities; new merchants, especially in the importing of goods, who played the main role in connecting local markets with global markets; and immigrants who came to the country after the discovery of oil (Aboelenein 1999).

Today, the UAE is a rapidly growing economy with a high GDP per capita and energy consumption per capita. The GDP per capita of $55,200 is currently the 7th highest in the world and 3rd in the Middle East after Qatar and Kuwait (as reported in the CIA World Factbook in 2008). There are several estimates of the actual growth rate of the nation's

GDP. Despite their differences, all indicate that the UAE currently has one of the fastest growing economies in the world.

Therefore, the social structure of the post-oil discovery may be outlined by four main changes, namely, the changes in family structure from an extended family to a nuclear family, the increase in exogamous marriages (marriages from outside the tribe), the increase of age at marriage for both men and women, and the changes in women's roles, especially after attaining higher education and participating actively in the labor force. In the next sections I will discuss the social context of today's UAE society in more detail.

THE DEMOGRAPHY OF THE UAE

The United Arab Emirates is a country of 4.5 million people in 2008 according to the Population Reference Bureau (2008). Among the GCC countries, the population of 4.5 million puts the UAE in second place distantly behind Saudi Arabia with 28.1 million in 2008; Kuwait and Oman, each with 2.7 million, are tied for third, Qatar (around 900,000) is in fifth place, and Bahrain (800,000) is in last place (Population Reference Bureau 2008).

The basic demographic information about the UAE shows that the country's birth and death rates in 2008 are 25/1,000 and 6/1,000, resulting in the lowest rate of natural increase of the GCC countries of 1.3 per cent, compared to 2.7 per cent for Saudi Arabia, 2.1 for Oman, 1.9 for Kuwait, 1.7 for Bahrain, and 1.5 for Qatar. The country has a very low infant mortality rate of 7/1,000 and a total fertility rate (TFR) of 2.0, just below replacement fertility levels (Population Reference Bureau 2008). The UAE fertility rate is the lowest among the GCC countries. As Figure 1 shows, among the GCC countries, Saudi Arabia has the highest TFR of 4.0, then Oman with 3.4, Qatar and Kuwait with 2.6 each, and Bahrain with 2.5. Unlike the UAE and Qatar, during the past three decades, the increase in the size of the population of Saudi nationals (as well as Oman nationals) has been primarily due to natural increase, namely, relatively high fertility and rapidly declining mortality (Lingawi 2005).
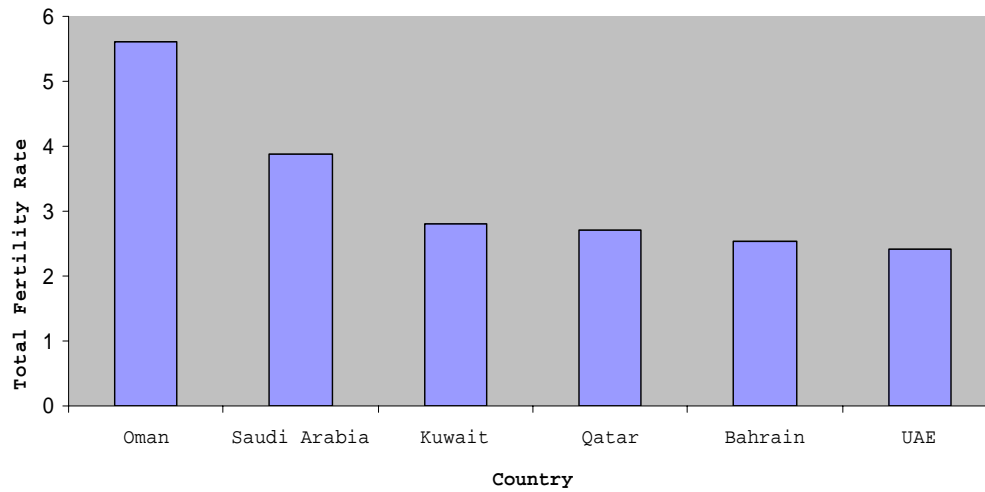
Source: U.S Census Beaure, Internationl Data Base.

Figure 1. Total Fertility Rates in the GCC, 2008

The UAE and other GCC countries have experienced a considerable decline in fertility. Figure 2 shows the continuous decline in UAE fertility since the 1970s. Also, the fertility rates in the GCC countries have undergone considerable change. Figure 3 shows these declines since 1990 and gives a prediction of a continuous decline in the coming years for all the GCC countries.
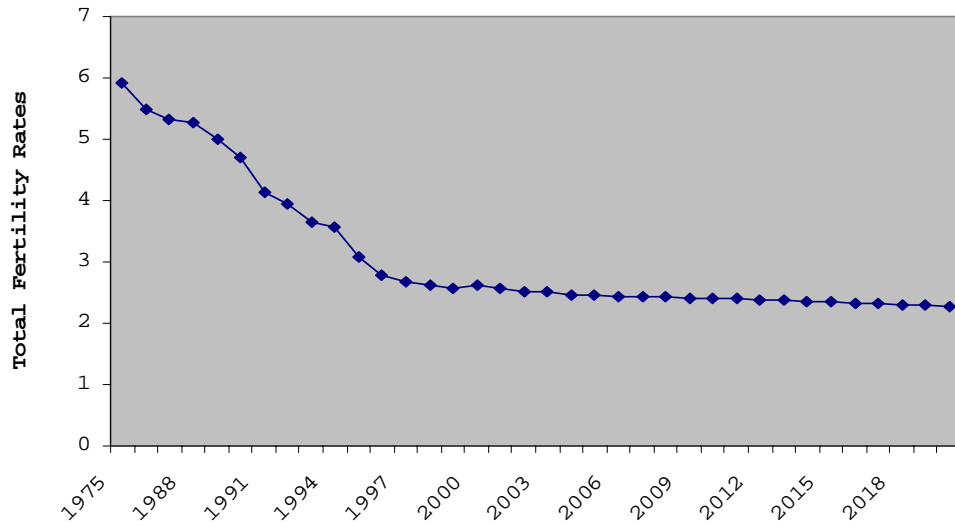
Source: U.S Census Beaure, Internationl Data Base.

Figure 2.   UAE Total Fertility Rates, 1975-2020
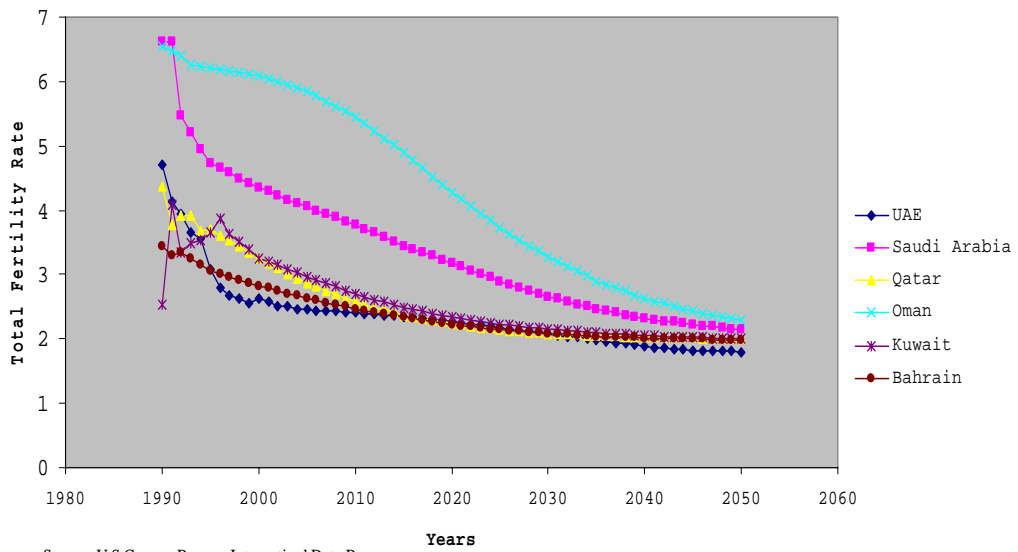
Source: U.S Census Beaure, Internationl Data Base.

Figure 3. Total Fertility Rates in the GCC, 1990-2050

Unlike virtually all countries of the world, except for Qatar, the majority, indeed over 80 per cent, of the population of the UAE is comprised of non-citizens of the UAE, that is, persons not born in the UAE. Table 2 shows the number of international migrants as a percentage of the total population for the six GCC countries for different years from 1960 to 2005. Figure 4 also shows the progression and trend of the number of international migrants in all the GCC countries from 1960 to 2000.

Table 2.   International Migrants as a Percentage of the
            Total Population for the GCC Countries, 1960-
            2005

Year	UAE	Qatar	Kuwait	Bahrain	Oman	Saudi Arabia
1960	2.4	32	32.6	17.1	5.6	1.6
1965	18	48.7	51.1	20.1	5.8	3.3
1970	29.3	61.4	62.3	17.3	5.4	6.2
1975	58.9	69.6	65.7	22.1	8.2	12.8
1980	70.8	72.2	69.6	29.8	15.2	20
1985	71.5	78.2	71.1	33.1	21.4	26.4
1990	71.2	79.1	72.4	35.1	24.5	29
1995	70.5	77.2	58.7	37.5	26.3	24.7
2000	70.4	76	62.2	37.8	24.8	23.9
2005	80	78.3	62.1	40.7	24.4	25.9

Source: United Nation Department of Economic and Social Affairs/Population Division. 2005. Trends in Total Migrant Stock: The 2005 Revision http://esa.un.org/migration.

Source: UN Department of Economic and Social Affairs/Population Division : "Trends in Total Migrant Stock: The 2005 Revision" http://esa.un.org/migration
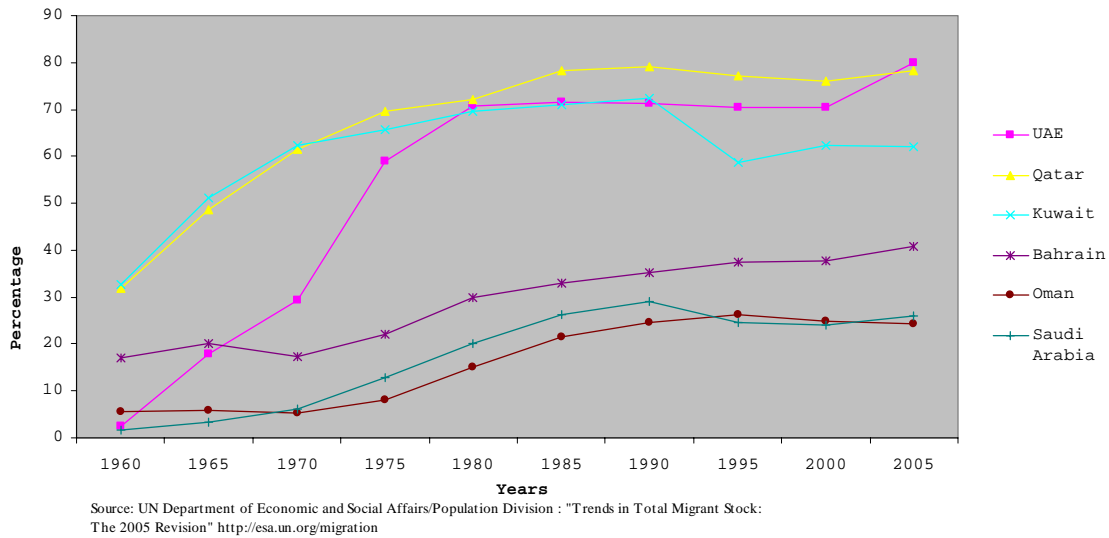
Figure 4.   International Migrants as a Percentage of the Population in the Arabian Gulf Countries, 1960-2005

The citizen and non-citizen populations of the UAE are very different from one another. In addition, the non-citizen population is four times larger than the citizen population. Figure 5 is an age-sex population pyramid of the total population of the UAE in 2005. This is the combined population, combining both citizens (Emaratis) and non-citizens (non-Emaratis). This is a hugely unbalanced population with tremendously large numbers of young men as a result of high levels of migration.
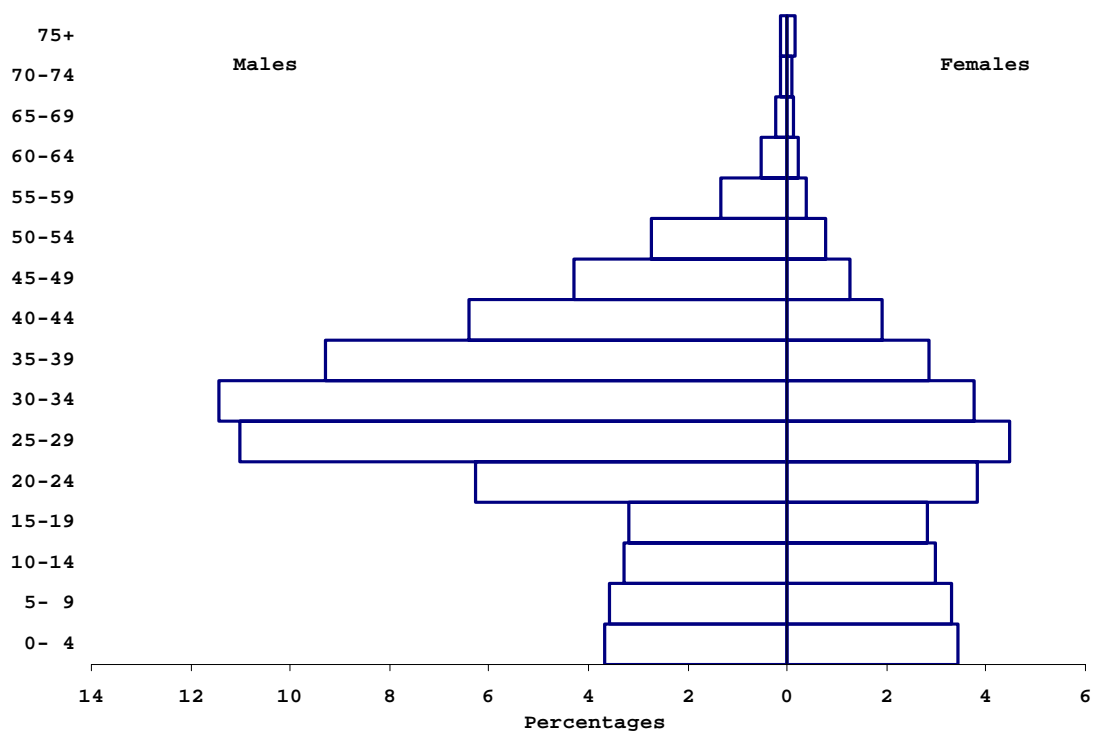
Figure 5. Age-Sex Structure of UAE Population, 2005

Figure 6 is an age-sex population pyramid of the citizen (Emarati) population of the UAE. This is a much more balanced population than that of the total UAE shown in Figure 7.

Males   **Females**

75+
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24
15-19
10-14
5- 9
0- 4

8   6   4   2   0   2   4   6   8
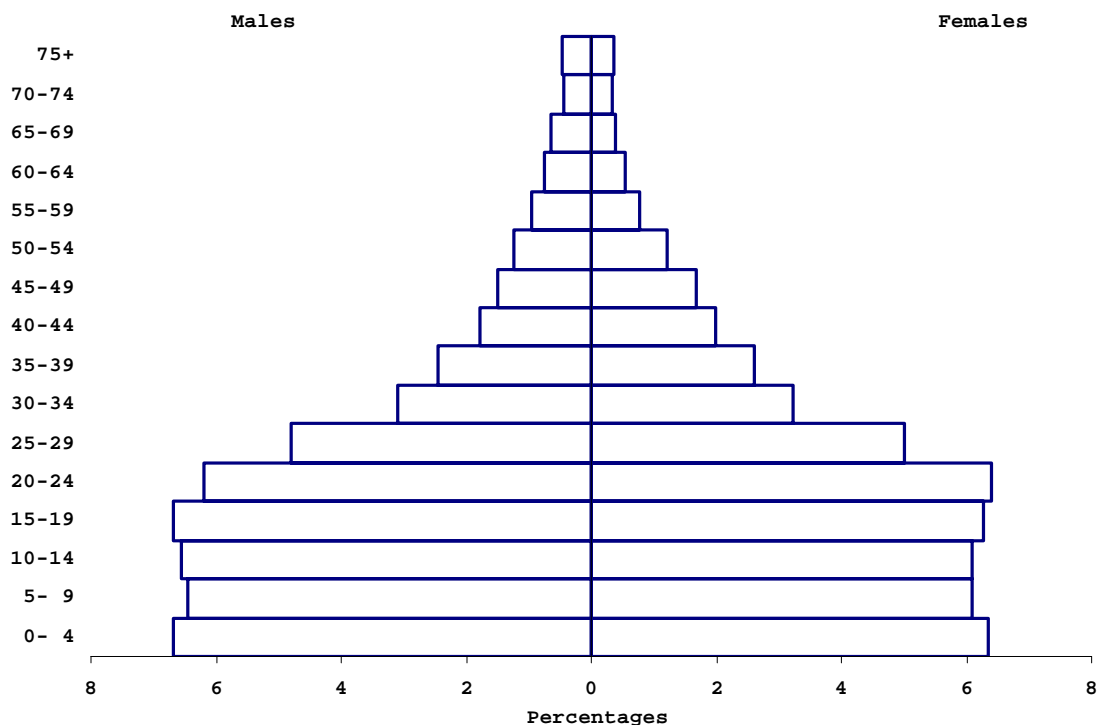
Percentages

Figure 6 . Age-Sex Structure of UAE Nationals, 2005

As shown in Figure 7 more than half of the population

of the UAE in 2005 (about 58 per cent) came from Asian non

Arab countries, mainly India, Pakistan, and Bangladesh,

with relatively smaller proportions coming from Indonesia,

Philippines, Korea, and China. The second largest group

came from other Arab countries (17.25 per cent). Less than

2 per cent came from the GCC countries and the same small

percentage came from the European countries; and fewer

people came from the African non Arab countries and from

North American countries (both accounted for 1.31 per cent).

Source: Ministry of Planning, 2005
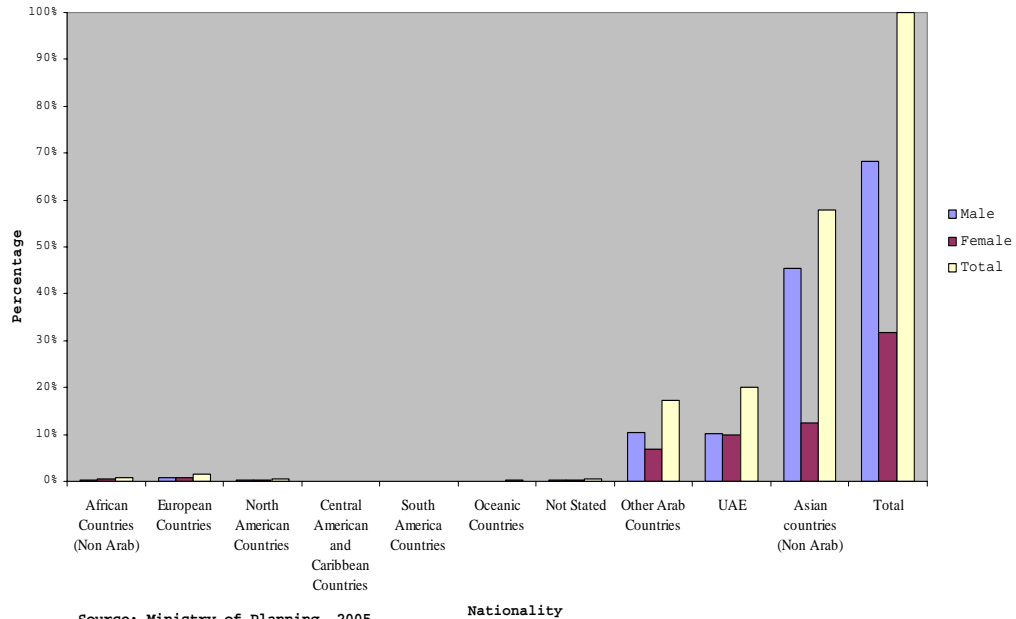
Figure 7. UAE Population by Sex and Nationality, 2005

In this dissertation I am studying the fertility patterns of women in the childbearing ages from the citizen (Emarati) population.

The very high proportion of non-citizens (80 per cent) in the UAE has created what is called today, the demographic imbalance problem. Thus, since the oil price rises in the 1970s and 1980s, the rate of economic development has been significant in the UAE as well as in other GCC countries. As in other Gulf countries, the UAE local population in the pre-oil era was small and lacked the technical skills needed for modernizing the traditional

society. As a result, the major State policy was to import all levels of skilled laborers. The inflow of foreign laborers and professionals has continued in such large numbers that in some Gulf societies, namely UAE, Qatar, and Kuwait, the nationals have become minorities in their own countries. The most extreme case is the UAE where in 2005 the UAE census revealed that the nationals are only 20 per cent of the total population. Thus, after about thirty four years since its establishment, UAE nationals constitute a small percentage of the total population.

Indeed, the massive investment in social and economic infrastructure required large number of foreign workers. Migrant labor was required in construction projects, industry, trade, and services, including household services (Zachariah, Prakash and Rajan 2003). Currently, nationals are highly concentrated in the governmental sector (Sabban 2003). Moreover, the UAE is also considered one of the countries with strong pull factors for foreign migrants to the extent that its economy is becoming almost fully driven by migrants, and mainly, to meet migrant demands.

At the turn of the 20th century, the estimated number of UAE nationals was around 80,000; almost all were citizens of the region and the population growth rate was

slow (Sabban 2002). Over the next sixty years the numbers
of inhabitants increased by 6,000 and most of them were
nationals (Faris 1996; Sabban 2002). But after the first
exportation of oil, the number of non-nationals in the UAE
rose by 66,000, accounting for 37 per cent of the total
population during the year 1968 (Ministry of Planning 1994;
Sabban 2002). Only four years after the establishment of
the UAE federation in 1971, 356,000 foreign workers were in
the country, representing an average of 64 per cent of the
total population (Sabban 2002). At present, the non-
nationals comprise more than 80 per cent of the population
(Ministry of Planning 2005; Al-Abed, Vine, and Hellyer
2005), a percentage unmatched anywhere else in the world,
except in Qatar. In 2005, with a total labor force of
2,558,541 men and women, only 214,440 (or 9.08 per cent)
were nationals. For this total of 9.08 per cent, 7.90 per
cent were men, with the remaining 1.18 being women
(Ministry of Planning 2005).

Table 3 shows the continuous decrease of nationals'
participation in the workforce.

Table 3. Changes in Workforce Participation in UAE by Gender and by Nationality, 1975-2005

Work Force	1997		1985		1995		2005	
	N	%	N	%	N	%	N	%
Total	293,788	100.00	683,825	100.00	1,335,894	100.00	2,558,541	100.00
Women	9,803	3.34	65,415	9.57	155,790	11.66	344,748	13.47
Men	283,985	96.66	618,410	90.43	1,180,104	88.34	2,123,563	83.00
Nationals	44,631	15.19	68,319	9.99	121,291	9.08	214,440	8.38
National Women	1,086	0.37	3,997	0.58	15,729	1.18	46,656	1.82
National Men	43,545	14.82	64,322	9.41	105,562	7.90	167,784	6.56
Expatriates	249,157	84.81	615,506	90.01	1,214,603	90.92	2,344,101	91.62
Expatriate Women	8,717	2.97	61,418	8.98	140,061	10.48	298,322	11.66
Expatriate Men	240,440	81.84	554,088	81.03	1,074,542	80.44	2,045,779	79.96

Source: Ministry of Planning

The UAE, indeed, is not the only country in the region which suffers from a demographic imbalance between nationals and foreign workers. In 2005, non-nationals ranged from 24 to 26 per cent of the total population in Oman and Saudi Arabia, and to 62 and 78 per cent in Kuwait and Qatar, according to data from the Department of Economics and Social Affairs of the United Nations. According to the data and recommendations of the 2006 Human Development Report on the State of Qatar, the small number of Qatari nationals, only around 20 per cent of the total population of 744,000, cannot meet the growing labor requirements of Qatar's booming economy. This factor, along with a decline in the fertility rate of nationals, may lead to a growing imbalance by 2015, when the forecasted population will reach 1.3 million (Bibbo 2007). In Saudi Arabia and Oman, foreigners constitute at least 60 per cent of the workforce (Kapiszewski 2001). As estimated by Kapiszewski this means that there are five working foreigners for each working national in Kuwait and Qatar, and nine-to-one in the UAE.

In the GCC countries, one of the major demographic characteristics of their population structures is that the populations are quite young. When the oil baby boomers of

the mid-1970s entering the labor market in the late 1990s, the share of young (less than 15) in the population will fall and the supply of the national labor force will grow faster than the population (Girgis 2002). "More specifically, according to the UN population projections, the unweighted GCC average of relative share of the 0-14 years group will decline gradually and steadily over the years from 39.7 per cent in 1975, to 33.7 per cent in 2005, and to 28.8 per cent in 2025. It follows then that the share of the labor force will increase from 58 per cent in 1975 to 63 percent in 2005, and so will the number of nationals searching for jobs" (Girgis 2002: 8).

Indeed, the relatively large proportion of young people represents a demographic time bomb of considerable force. Thus, suitable employment must be found for these cohorts of increasing size when they eventually enter the labor market. Because most, if not all, of these young cohorts will likely be searching for governmental jobs, as their parents did, a policy of providing government employment may result simply in the growth of the government sector rather than substituting national workers for foreign workers (Girgis 2002).

THE SOCIAL CONTEXT OF THE UAE

The UAE has undergone rapid socioeconomic development in the last few decades, resulting in important changes in sociodemographic patterns. The normative system in the UAE is structured around the family and is linked to traditional and religious teachings that consider family formation as a basic function of the society. The family is the unit in which reproduction is authorized and is expected to occur through marriage. Marriage and establishing a family are treated as essential and sacred. Marriage without children is considered to be an incomplete state (Alnuaimi 2001). In the past, the main and the most important role of women was to bear and raise children. Today, this role is still crucial, but has been modified somewhat given the increasing participation of women in higher education and in the paid labor force.

As in most Arab Islamic societies, UAE women traditionally had their own separate sphere. Socialization in gender roles was clearly divided, with women taking their roles inside the household and men holding the power inside and outside the household (Sabban 2002). Prior to the oil era, this division between private and public spheres was very obvious. Nowadays, the division is

lessened. Today women increasingly participate in the workplace and share the public sphere with men (Sabban 2002).

The overall level of illiteracy in the UAE has fallen from 44 per cent in 1975 to 20 percent in 1995 to 9.3 per cent in 2005 (Ministry of Planning 2005). According to the 1995 UN Development Report, the United Arab Emirates has the highest level of female literacy in the Arab World (Sabban 2002). Also according to the UAE Ministry of Planning, 12 per cent of Emarati women in 2005 are in the paid labor force, compared to 5.4 per cent in 1995, two per cent in 1985, and one per cent in 1975. More than half of the employed Emarati women working outside the home (53 per cent) are found in professional work, mainly as teachers in girl's schools (Ministry of Planning 2005). The unemployment rate is estimated to be twice that of men, i.e., 19.7% for women and 8.2% for men (Tanmia 2005).

These increases in levels of education and labor force participation have led to an increased age at first marriage. Only thirty-three years ago in the UAE, the age at first marriage for women was 18 years. By the end of the 1990s it had increased to 23.1 (Tabutin and Schoumaker 2005). This increase in the age at first marriage of women

has led to a reduction in the difference in mean age between spouses at marriage; it was 7.9 years in 1975, but dropped to 2.5 in 1998 (Tabutin and Schoumaker 2005)

Non-marriage is considered to be a major social problem in the UAE. Men and women expect a woman to be both a wife and a mother. A woman is expected to combine these two key roles with her role in the labor force, if she is employed outside the home. Labor force participation is not seen as an alternative to a woman's roles as wife and mother.

Divorce is also considered to be a social problem. Despite the fact that Islam and the UAE culture both discourage divorce, the divorce rate has indeed been increasing. There is a growing general belief among some in the UAE that women's education and work, as well as the adoption of Western values, are among the many reasons for the rise in divorce rates in the UAE. It is thought that with increasing levels of education and labor force participation, women attain a degree of autonomy and become less dependent on men. Women who are divorced carry a stigma, but men do not.

Polygyny in Arab Muslim societies has declined in recent years (Chamie 1985; Farques 1997; Tabutin and

Schoumaker 2005), but has increased slightly in the Arab Gulf societies. Chamie (1985) has argued that the increasing trends in the proportions of women in polygynous marriages among Arab Gulf Muslims does not necessarily result from differences in age structure, residence (urban/rural) composition, or educational attainment. Instead, he argues, that polygyny may be a transitional phenomenon occurring in some of these oil-producing societies because, despite the great economic transformations, the societies are still relatively traditional. As the social development of these countries becomes more consistent with their economic development, polygyny is likely to decline (Chamie 1985).

Some have argued that this escalated trend in polygyny in Gulf countries in past decades was due in large part to the increasing wealth of men. Studies have shown that the intensity of polygyny is greater among wealthy men, not only because they are more likely to take additional wives, but also because their wives are less likely to divorce them (Timmaeus and Reynar 1998; Ohadike 1968). As we have already noted, divorce in the UAE and in the other Gulf countries is considered to be shameful and is disdained, and divorced women are stigmatized and are less likely than

single women to be able to marry. Therefore, being wives of polygynists is more socially and economically acceptable than being divorced women.

Although polygyny has increased slightly in the UAE and in other Gulf countries in recent years, there are good reasons to expect it to decline in future years. However, there is a new phenomenon in the UAE and in other Gulf societies that might counter the expected polygyny decline. We refer to the increasing numbers of women who remain single into their twenties and thirties. Women who have achieved a high level of education, and remained single into their twenties or later to do so, might well have acquired a strong preference for a monogamous marriage. But their older age and their increased levels of education could very well make them less attractive as prospective wives for single men. Thus they may be unable to realize their preference for a monogamous marriage and hence accept a proposal from a polygynist (Timmaeus and Reynar 1998). Moreover, since most young single women tend to be more attractive brides than divorcees, widows, and women who remain single until an older age, these young single women are more likely to become higher-order wives than first partners, especially when they see their older sisters

approaching their thirties while still single. Hence the fear of becoming a spinster might well motivate younger single women to accept marriage proposals from polygynists.

HYPOTHESES

As a society that values children for their financial and emotional supports, especially for the security for their old-age parents, I expect that Emarati women in polygynous marriages will have slightly higher fertility than women in monogamous marriages. There are many reasons for this expectation. First, one of the reasons that Emarati men marry additional wives is to satisfy their desire for a large number of children. Therefore, marrying more than one wife will assist him in meeting this goal. Second, Emarati men are financially better-off and can provide the financial costs of having more than one wife, such as housing, and the outlay for each wife and her children. In addition to that, polygynist Emarati men tend to have less education than their monogamous counterparts. To illustrate, the study population of this dissertation shows that the husbands of polygynous wives have a lower mean level of education (4.99 years) than the husbands of monogamous wives (8.80 years.); this might positively affect their wives' fertility. Third, one of the main

proximate determinants of fertility, according to Bongaarts (1975), is postpartum infecundability (the period after a birth without ovulation). Its length is determined primarily by the duration and intensity of breastfeeding or sexual abstinence. To illustrate, the duration and intensity of breastfeeding should affect the likelihood of ovulation. Thus breastfeeding could well lead to a substantially longer period without ovulation than the typical 1.5 to 2-month interval that is experienced by women who do not breastfeed their children (Leridon 1977). Also, if women exclusively breastfeed their children for a long period, they will have a significantly lower chance of ovulating than women who supplement breast-feeding with other food (Morgan and Hagewen 2005). Therefore, they will be more likely to have lower fertility levels. The overall duration of breastfeeding for Emarati women is to a great extent shorter than that of women in other societies, such as the African societies in which the duration of breastfeeding may last as long as three years. According to Musaiger (1992), the mean duration of breastfeeding for UAE women is 8.1 months: 6.7 for employed women and 8.3 for unemployed women (see also Musaiger 1995). Finally, unlike other societies, Emarati women do not have a long period of

postnatal sexual abstinence, which, according to Bongaarts (1975), might also determine their fertility levels. Unlike some women in other societies where intercourse during pregnancy and the postpartum period is frequently forbidden by customs and taboos, Emarati women usually do not have such customs and taboos. The sexual abstinence for Emarati women usually does not exceed 40 days from the birth of a child.

Therefore, I put forth the following hypotheses that will be tested in later chapters of this dissertation.

H_1 – Women in polygynous marriages will have slightly higher fertility than women in monogamous marriages. Thus, polygynous women will have higher fertility than monogamous women (Demand for Progeny Model).

H_2 – Age of the husband will be negatively related to fertility. As the age of husband increases, the fertility of woman will decrease (Coital Frequency Model)

H_3 – Being in a co-residence with another wife (or wives) should have a positive effect on fertility due to the competition factor between wives (Demand for progeny Model).

H_4 – Fertility will have a negative association with the number of wives in the union. The fertility of the wife

will decrease with the number of wives in the union (Coital

Frequency Model).

CHAPTER IV

DATA AND METHODS

In this chapter I will discuss my data and the methods I will be using. First, I discuss my data, and then the different methods, namely, Logistic Regression and Poisson Regression/Negative Binomial Regression. Then I will operationalize and discuss the dependent and independent variables to be used in each of the regression analyses.

DATA

The main data for the analyses in my dissertation are from the National Family Survey for the Characteristics of the Native Households conducted in 1998-1999 by the Central Department of Statistics in the Ministry of Planning of the UAE. According to the Ministry of Planning (2000) the sample was a two-stage, stratified, cluster probability, self-weighting, nationally representative sample of approximately 4,000 households in 209 primary sampling unites (PSUs). The PSUs are defined as villages in the rural sector, and as census enumeration areas in the urban sector. The sampling frame for the survey was the list of citizen household listings obtained in the 1995 population census. Before the selection, the PSUs were stratified into

six size categories based on the number of citizen households per category. The PSUs containing small numbers of citizen households were excluded from the frame. In the urban sector, 1,617 enumeration areas each containing fewer than five citizen households were excluded and 98 villages each containing fewer than ten citizen households were excluded in the rural sector. Altogether, 1,867 urban households (3.7 per cent) and 165 rural households (0.6 per cent) were eliminated from survey coverage by this process.

The sample was selected in such a way as to achieve a self-weighting design, that is, each household has the same probability of selection and therefore the same weight, or inflation factor. "This was done by selecting the PSUs at one rate, varying according to stratum, and the households at another, so that the overall probability of selection is 1 in 20 across all strata. Hence the survey weight will be 20 for every household selected" (Ministry of Planning 2000: 227)

The sample is proportionally distributed among the seven emirates comprising the United Arab Emirates as well as by urban and rural residence. The survey was designed to provide national-level estimates for UAE citizen households; to generate data on patterns and determinants

of marriage and divorce, spinsterhood, fertility, family planning, child mortality, school dropouts and family stability (especially parental care and juvenile delinquency); and to provide the basis for further research as well as analysis of the prevailing problems of the citizen families and their determinants in both urban and rural areas and for different emirates.

To fulfill the objectives of the National Family Survey, five sets of questionnaires were designed: 1) Household and Living Conditions; 2) Individual Questionnaire for ever married women; 3) Delay in Age at Marriage; 4) School Drop-out; and 5) Juvenile Delinquency.

In this dissertation I use data from the second individual questionnaire, namely, *The Eligible Women Questionnaire*. This is a representative sample of 4,245 ever married women aged 15-49. The criteria for eligibility in the survey were UAE citizenship, age, and martial status. Of these 4,245 ever married women, however, I only included the currently married women who are only once married. My analysis is thus restricted to around 3,400 currently married women who were married once. Thus, because marital instability (woman's current marital status and the number of marriages she has had) affects her number

of live births (Varea, et al. 1996), those women who are currently unmarried (divorcees and widows) and those who are separated from their husbands are excluded.

METHODS

I now discuss the different methods I use in my dissertation. In CHAPTER V, I am using Logistic Regression (LR) to estimate the effect of polygyny on the occurrence of a birth to a woman during the last 12 months. In CHAPTER VI, I am using Negative Binomial Regression (NBR) to estimate the effect of polygyny on the number of children ever born (CEB) to a woman.

Logistic Regression

In CHAPTER VI, I use Logistic Regression to estimate equations predicting the occurrence of a birth in the last 12 months. Logistic regression is used when the dependent variable is dichotomous (i.e., binary), as opposed to continuous. Since I incorporate several continuous variables in my analysis as independent variables (e.g duration of marriage, age at first marriage, etc.), logistic regression permits the estimation of probabilities in models containing continuous and/or categorical independent variable.

The logistic regression converts the dependent variable into a logit, or the natural logarithm of the odds of success. Thus, logistic regression estimates the probability of a certain event occurring, such as the logit of having a birth in the last 12 months, according to the following equation:

$$\ln\left[\frac{p}{1-p}\right] = a + b_1 X_1 + b_2 X_2 + \ldots + b_n X_n$$

where,

$\ln(p/1-p)$, is the logit, or the log odds of that the women had a birth in the last 12 months.

X_1 to X_n are her characteristics; and a and b_1 through b_n are the logit intercept and regression coefficients.

In my analysis of the first dependent variable, namely, the occurrence of a birth in the last 12 months, the variable assumes the value of 1, or yes, if a woman had a birth in the last 12 months prior to the survey date; and a value of 0, or no, if a woman did not have a birth in the last 12 months prior to the survey date. The mean is the proportion of times that the dependent variable receives the value of 1, that is, giving birth in the last 12 months.

Negative Binomial Regression and Poisson Regression

In CHAPTER VII, I use Negative Binomial Regression and/or Poisson regression to estimate regression models of children ever born. Both Poisson Regression and Negative Binomial Regression are used when the dependent variable is a count variable, that is, a non-negative, integer, such as the number of children ever born. Linear regression models do not work well for count variables unless the distribution is independently and identically distributed. Otherwise OLS models can lead to "inefficient, inconsistent, and biased estimates" (Long and Freese 2003: 245).

Negative Binomial regression is preferred over Poisson regression when there is overdispersion of the dependent variable, that is, the variance is significantly greater than the mean. The model is reduced to the Poisson Regression when there is not a sufficient amount of overdispersion, which is determined by the magnitude of the alpha coefficient (Long and Freese 2003).

The Poisson regression model is preferred when the mean and variance of the count is equal or near equal. The Poisson regression model incorporates observed

heterogeneity according to the following structural equation:

$$\mu_i = \exp(a + X_{1i}\, b_1 + X_{2i}\, b_2 + \ldots + X_{ki}\, b_k)$$

where:

μ_i is the expected number of children ever born to the ith woman.

X_{1i} to X_{ki} are her characteristics; and a and b_1 through b_k are the Poisson intercept and regression coefficients.

I also examine the distribution of children ever born (CEB). If there is an over-representation of women who have zero children, I will adjust the Poisson regression model and Negative Binomial regression model with Zero-inflated models.

Next, I describe my dependent and independent variables and discuss the operationlization and distribution.

DEPENDENT AND INDEPENDENT VARIABLES

Each of my chapters uses slightly different independent variables, so I will first discuss the dependent and independent variables for CHAPTER VI and then

discuss the dependent and independent variables for CHAPTER VII.

Chapter VI Variables

In CHAPTER VI, I examine the occurrence of a birth in the last 12 months and polygyny. The occurrence of a birth in the last 12 months is the dependent variable and polygyny is the main independent variable. My data show that of the 3,402 currently married women who are only once married, there are 858 women who have had a birth during the last year (around 25 per cent).

Table 4 presents the descriptive statistics for all Emarati women for the occurrence of a birth in the last 12 months. Table 5 presents descriptive statistics for monogamous women, and Table 6 presents descriptive statistics for polygynous women.

Table 4. Descriptive Statistics of All Married Emarati Women for Occurrence of a Birth in the Last Year, 1999

Variable	Mean	Std. Dev.	Minimum	Maximum
Woman had a Birth in the Last Year (yes=1)	0.252	0.434	0	1
Polygyny (yes=1)	0.118	0.323	0	1
Husband's Age	39.581	12.555	16	90
Age at 1st Marriage	18.158	3.944	12	40
Age at Menarche	13.036	1.193	9	16
Marriage Acceptance (yes=1)	0.979	0.144	0	1
Woman's Education (in years)	7.994	6.167	0	21
Employed Woman (yes=1)	0.145	0.352	0	1
Urban Residence (yes=1)	0.677	0.468	0	1
Ever Used Contraceptives (yes=1)	0.591	0.492	0	1
Husband's Education (in years)	8.352	6.280	0	22
Number of wives in the Union[a]	1.150	0.424	0	1

N=3,402

Source: National Family Survey for the Characteristics of the Native Households, 1999

[a] This variable includes the number of wives in the union a husband had at the time of marriage to the woman (the study participant), including her. It includes monogamous and polygynous wives at the time of marriage.

Table 5. Descriptive Statistics of Monogamous Emarati Women for Occurrence of a Birth in the Last Year, 1999

Variable	Mean	Std.Dev.	Minimum	Maximum
Woman had a Birth in the Last Year (yes=1)	0.256	0.437	0	1
Husband's Age	38.246	11.975	16	90
Age at 1st Marriage	18.170	3.852	12	40
Age at Menarche	13.039	1.191	9	16
Marriage Acceptance (yes=1)	0.982	0.132	0	1
Woman's Education (in years)	8.402	6.109	0	21
Employed Woman (yes=1)	0.152	0.359	0	1
Urban Residence (yes=1)	0.691	0.4623	0	1
Ever Used Contraceptives (yes=1)	0.597	0.491	0	1
Husband's Education (in years)	8.801	6.230	0	22
Number of wives in the Union[a]	1.067	0.286	1	4

N=3,001
Source: National Family Survey for the Characteristics of the Native Households, 1999
[a] This variable includes the number of wives in the union a husband had at the time of marriage to the woman (the study participant), including her. It includes monogamous and polygynous wives at the time of marriage.

Table 6. **Descriptive Statistics of Polygynous Emarati Women for Occurrence of a Birth in the Last Year, 1999**

Variable	Mean	Std. Dev.	Minimum	Maximum
Woman had a Birth in the Last Year (yes=1)	0.222	0.416	0	1
Husband's Age	49.574	12.295	22	90
Age at 1st Marriage	18.070	4.577	12	36
Age at Menarche	13.015	1.208	9	16
Marriage Acceptance (yes=1)	0.953	0.213	0	1
Woman's Education (in years)	4.940	5.725	0	20
Employed Woman (yes=1)	0.092	0.290	0	1
Urban Residence (yes=1)	0.574	0.495	0	1
Ever Used Contraceptives (yes=1)	0.541	0.499	0	1
Husband's Education (in years)	4.990	5.602	0	21
Co-residence with another wife(or wives) (yes=1)	0.392	0.489	0	1
Number of wives in the union	1.771	0.691	1	4

N=401
Source: National Family Survey for the Characteristics of the Native Households, 1999

Around 25 per cent of the women in my sample had a birth in the last months. My main independent variable is a dummy variable, whether or not the woman is in a polygynous

marriage (yes=1). The survey asks "Does your husband currently have another wife, that is, other than you?" Based on this question, I am defining women in polygynous unions as women who answered yes to the question. In my data, 401 (around 12 per cent) of all married Emarati women are currently married to polygynists.

The other independent variables are included to control for relevant demographic and social factors.

The mean "Husband's Age" for Emarati women is 39.58 years with a minimum of 16 years and a maximum of 90 years. It has the same minimum and maximum rage for monogamous wives, but a smaller range for the husbands of polygynous wives (22 to 90). The data also show that polygynists are about 11 years older than their monogamist counterparts (49.57 and 38.25 years, respectively).

The "Age at first marriage" variable shows that all Emarati women, on average, marry at age 18.15; and this is quite similar for monogamous wives and polygynous wives (18.17 and 18.07 respectively).

"Age at menarche" is the age in years when the woman experienced her first menstrual cycle. It is thought to signal the time when a female becomes capable of reproduction. It has been shown that age at menarche had a

direct or indirect significant effect on women's fertility (Udry 1979; Zelnick 1981; McKibben 2003). For Emarati women, the age at menarche is, on average, 13.04, with a very slight difference between polygynous and monogamous wives (13.02 and 13.04 receptively).

Most Emarati women have agreed to marry their husbands, that is, they have accepted to marry the men who have proposed the marriage, or the men who have been assigned or arranged to them to marry. The "Marriage acceptance" variable shows that among all Emarati women 97.88 per cent, on average, have agreed to marry their husbands, with relatively larger percentage for monogamous wives (98.23 per cent) than for polygynous wives (95.26 per cent). It is important to mention here that traditionally, Emarati woman usually has the right to accept or reject the marriage proposal submitted to her father (or to an entrusted representative, in the case of her father's death), but it is not acceptable for her to propose the marriage mate.

The "education" variable measures the years of completed education the woman has at the date of the survey. Emarati woman have a mean of 7.99 years of education. This has a range of 0 to 21 years of education,

with monogamous wives having a much higher mean (8.10 years) than polygynous wives (4.94).

The "employment" variable is thought to have influential effects on woman's fertility. This is a dummy variable coded yes if a woman worked at a job for money. On average, more than fourteen per cent of Emarati women are working at a paid job. This percentage varies quite a bit between monogamous wives (15.23 per cent) and polygynous wives (9.23 per cent).

"Urban Residence" controls for whether a woman lives in an urban or a rural area (urban=1). On average, sixty-eight per cent of the Emarati women are urban residents. About 70 per cent of monogamous and 58 per cent of polygynous wives are urban residents.

"Ever used contraceptives" controls for whether the woman has ever used any method of birth control in the past. On average, about 59 per cent of Emarati women have used a birth control method, with higher percentage for monogamous wives (60 per cent) than for polygynous wives (54 per cent).

"Husband's Education" refers to the years of completed education the woman's husband has to the date of the survey. Emarati husbands have a mean of 8.35 years of

education. This has a range of 0 to 22 years, with monogamous wives' husbands having a higher mean (8.80 years) than polygynous wives' husbands (4.99). This shows that Emarati men have a slightly more education than their wives (8.35 for men compared to 7.99 for their wives); the means are more similar between men and their polygynous wives (4.99 and 4.94 respectively) than between men and their monogamous wives (8.80 and 8.40 respectively).

The "Co-residence with another wife (or wives)" variable controls for whether the polygynous wife is living with another wife (or wives) in the residence (yes=1). About 40 per cent of polygynous wives say that they are living with another wife (or wives) in the same residence.

"Number of wives in the union" variable controls for the number of wives in the union at the time of marriage. In my data, more than 87 per cent of Emarati women are living in a one-wife union at the time of marriage, 10.70 per cent are in a two-wives union, 1.65 per cent are in a three-wives union, and 0.32 per cent are in a four-wives union.

I wanted to include other relevant control variables in my analyses such as age difference between spouses, duration of marriage, and the current number of wives in the union, but due to high multicollinearity of these variables and the other variables in my analyses, I had to remove them.

Chapter VII

The dependent variable for CHAPTER VII is the number of children ever born for Emarati women. As in the previous section, "Polygyny" is the main independent variable. Table 7 presents the descriptive statistics for all married Emarati women, Table 8 presents descriptive statistics for monogamous women, and Table 9 presents descriptive statistics for polygynous women.

**Table 7. Descriptive Statistics of All Married Emarati
            Women for Children Ever Born, 1999**

Variable	Mean	Std.Dev.	Minimum	Maximum
Children Ever Born	4.909	3.632	0	19
Polygyny (yes=1)	0.118	0.323	0	1
Husband's Age	39.581	12.555	16	90
Age at 1st Marriage	18.158	3.944	12	40
Age at Menarche	13.036	1.193	9	16
Marriage Acceptance (yes=1)	0.979	0.144	0	1
Urban Residence (yes=1)	0.677	0.468	0	1
Number of Wives in the Union[a]	1.150	0.424	1	4

N=3,402
Source: National Family Survey for the Characteristics of the Native
Households, 1999
[a] This variable includes the number of wives in the union a husband had
at the time of marriage to the woman (the study participant), including
her. It includes monogamous and polygynous wives at the time of
marriage.

Table 8. Descriptive Statistics of Monogamous Emarati Women for Children Ever Born, 1999

Variable	Mean	Std. Dev.	Minimum	Maximum
Children Ever Born	4.784	3.586	0	19
Husband's Age	38.246	11.975	16	90
Age at 1st Marriage	18.170	3.852	12	40
Age at Menarche	13.039	1.191	9	16
Marriage Acceptance (yes=1)	0.982	0.132	0	1
Urban Residence (yes=1)	0.691	0.462	0	1
Number of Wives in the Union[a]	1.067	0.286	1	4

N=3,001
Source: National Family Survey for the Characteristics of the Native Households, 1999
[a] This variable includes the number of wives in the union a husband had at the time of marriage to the woman (the study participant), including her. It includes monogamous and polygynous wives at the time of marriage.

Table 9. Descriptive Statistics of Polygynous Emarati Women for Children Ever Born, 1999

Variable	Mean	Std. Dev.	Minimum	Maximum
Children Ever Born	5.843	3.832	0	18
Husband's Age	49.574	12.295	22	90
Age at 1st Marriage	18.069	4.577	12	36
Age at Menarche	13.015	1.208	9	16
Marriage Acceptance (yes=1)	0.953	0.213	0	1
Urban Residence (yes=1)	0.574	0.495	0	1
Number of wives in the union	1.771	0.691	1	4

N=401
Source: National Family Survey for the Characteristics of the Native Households, 1999

The NFS data show that from the 3,402 married women, the average number of children ever born to married Emarati women is 4.91. It is higher for women in polygynous marriage (5.84) than for women in monogamous marriage (4.78).

As in the previous section, the major independent variable is polygyny, that is, whether a woman in polygynous marriage (polygyny=1). The only difference in this section is that I exclude some variables because they occurred, or could have occurred, after the determination

of the last child born in the CEB dependent variable. Thus, in CHAPTER VII I am not be able to use woman's education, her employment status, her husband's education, whether she has ever used contraceptives, and whether she lives in a same residence with another wife (or wives) variables. Consider the hypothetical case that some women may have had all their children long ago before they graduated from college, the value of the education variable reported in the survey. Similar statements may be made with regard to husband's education, woman's employment, whether she has ever used contraceptives, and whether she lives in a same residence with another wife (or wives).

The descriptive statistics for the variables in this section, namely, their means, standard deviations, minimums, and maximums are similar to the descriptive statistics for the variables in the previous section. Thus, polygyny, husband's age, age at first marriage, age at menarche, marriage acceptance, urban residence, and number of wives in the union all have the same descriptive statistics as in the previous section.

In this chapter Negative Binomial Regression will be used because the CEB has evidence of overdispersion. The alpha coefficient is significant, which indicates that

there is a significant amount of overdispersion and negative binomial regression is appropriate (Long and Freese 2003). The negative binomial model is preferred when variance of the count variable is larger than the mean, which is the case in my dependent variable (CEB). Thus the data show that the Emarati married women have a mean of 4.91 children ever born, with a range of 0 to 19, and a variance of 13.18.

I have plotted the Univariate Poisson distributions for the CEB for Emarati women. To compare the observed distribution and the Univariate Poisson distribution with a mean of 4.91 for UAE women, see Figure 26 in Appendix B.

In the next chapter I will elaborate on the characteristics of the population under study, namely, the Emarati married women who are only once married.

CHAPTER V

CHARACTERISTICS OF THE POPULATION UNDER STUDY

In this chapter, I first discuss the characteristics of the ever married women in the *National Family Survey for the Characteristics of the Native Households, 1999 (*the survey I am using for this study). Then I will discuss the characteristics of the specific population under study, namely, the characteristics of married Emarati women who are only married once.

THE CHARACTERISTICS OF EVER MARRIED EMARATI WOMEN

As mentioned in the last chapter, the *National Family Survey for the Characteristics of the Native Households, 1999* surveyed 4,245 ever married Emarati women, (i.e. married, divorced, widowed, and separated aged 15 to 49 years). The majority (90 per cent) of the ever married women in the reproductive ages are married, 5.4 per cent are divorced, 4 per cent are widowed, and less than 1 per cent are separated (Figure 8).
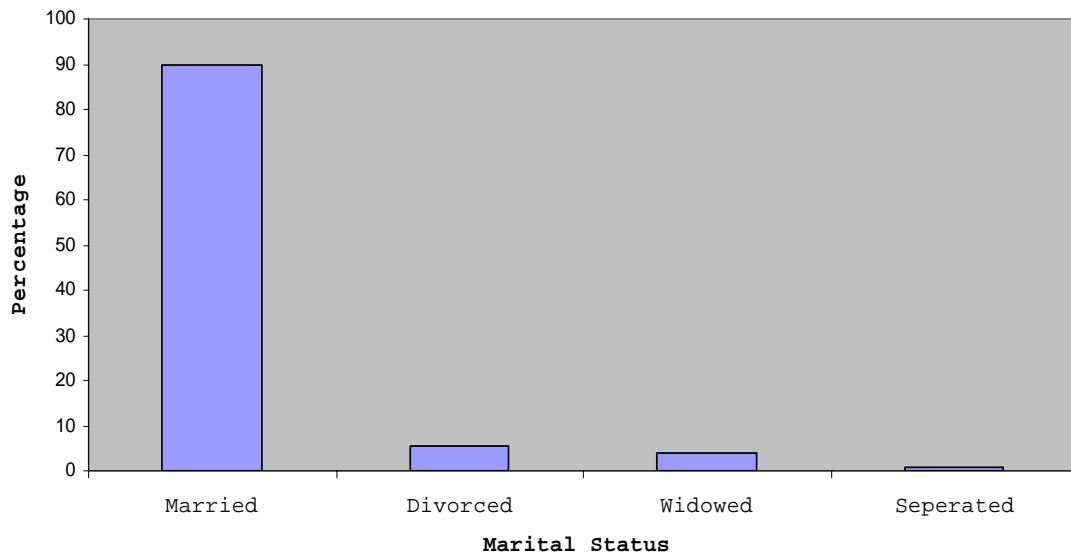
Source: National Family Survey for the Characteristics of the Native Households, 1999

**Figure 8. Percentage Distribution of Ever Married
Emarati Women by Marital Status, 1999**

Figure 9 shows that about 20 per cent of the first marriages of Emarati women last for 25+ years, 15 per cent for 20 to 24 years, 14 per cent for 15 to 19 years, and 19 per cent for less than five years.
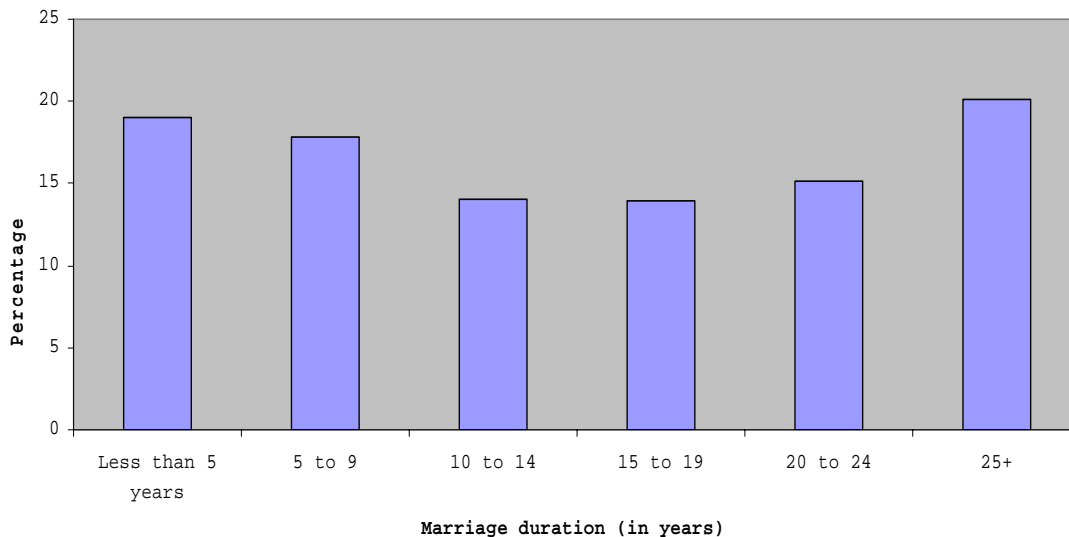
Source: National Family Survey for the Characteristics of the Native Households, 1999

**Figure 9.   Percentage Distribution of Ever Married Emarati
           Women by Duration of the First Marriage, 1999**

The survey data also show that most of the Emarati
women are living in urban areas (63 per cent), compared to
37 per cent living in rural areas. Also, only 13.3 per cent
of ever married women are employed.

The mean age at first marriage for Emarati women is
low compared to the average ages at first marriage in many
other countries. It is 18.4 years for urban women and 17.2
for rural women. Figure 10 shows that as the educational
attainment level increases, the age at first marriage also
increases. Thus, it is higher among those with college and
higher degrees (22.3 years) than among women with less
education. For example, women with primary education have a

mean age of first marriage of 16.9 compared to 18 for women with an intermediate education and 19.7 for women with secondary education. Also (not shown in the graph), employed women have a higher mean age at first marriage (20.7) than unemployed women (17.5).

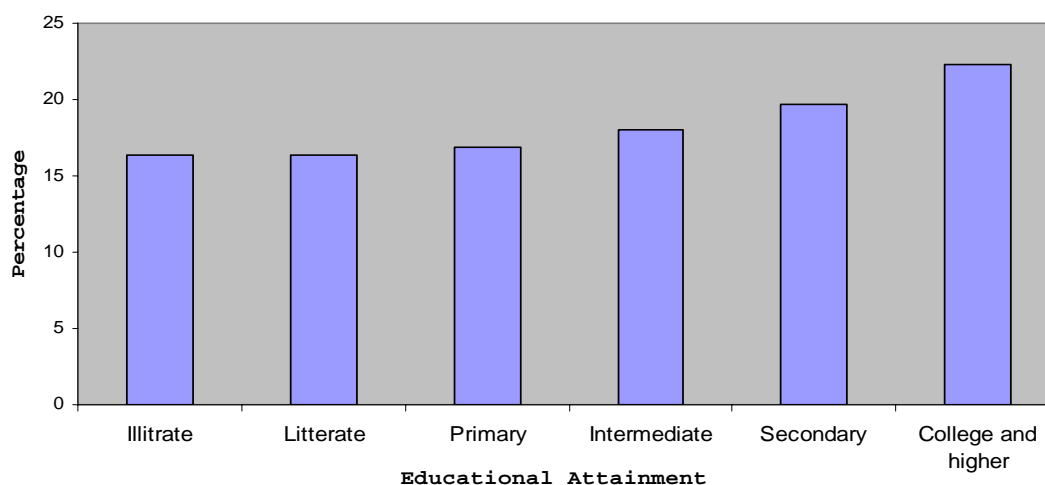

Source: National Family Survey for the Characteristics of the Native Households, 1999

Figure 10. Percentage Distribution of the Mean Age at First Marriage for Ever Married Emarati Women by Educational Attainment, 1999

The survey data also show that in 1999 Emarati women had a total fertility rate of 4.2 children; it was much higher than the national total fertility rate for the entire UAE country, that is, including both Emarati and non Emarati women, which was 2.56 for the same year of 1999. The TFR is also higher among Emarati women in rural areas (4.8 children) than in urban areas (3.8 children) (see

Figure 11), among unemployed women (4.6 children) than employed women (2.5 children) (see Table 10), and among less educated women than the more educated women (see Figure 12).

To illustrate, the TFR is 5.5 for the women who are illiterate or literate (can read and write), 4.8 for those with primary education, 4.5 for those with intermediate education, and 3.5 for those with secondary education or higher.

Source: National Family Survey for the Characteristics of the Native Households, 1999

Figure 11.   Age Specific Fertility Rats for Ever Married Emarati Women by Age and by Residence, 1999

Table 10.   Total Fertility Rates of Ever
            Married Emarati Women by
            Employment Status, 1999

Employment Status	TFR
Employed Women	2.5
Unemployed Women	4.6
Total	4.2

Source: National   Family   Survey   for   the
Characteristics of the Native Households, 1999

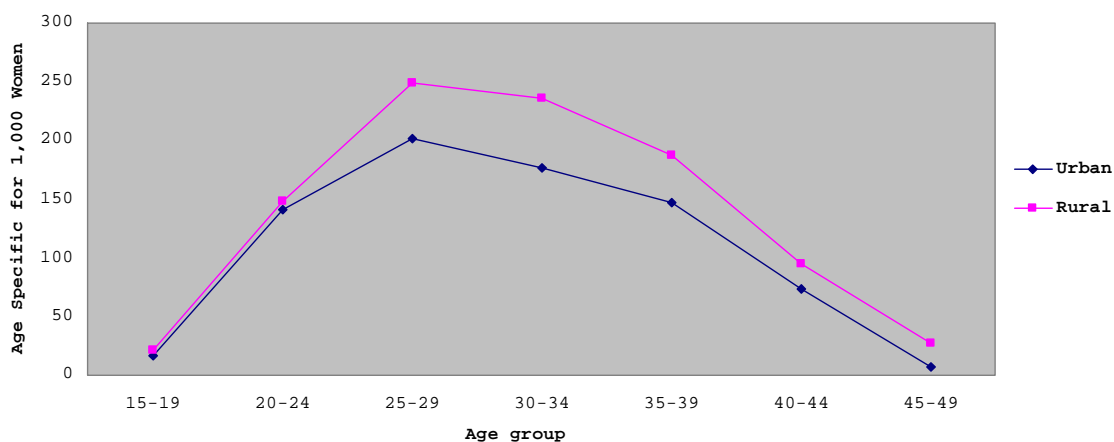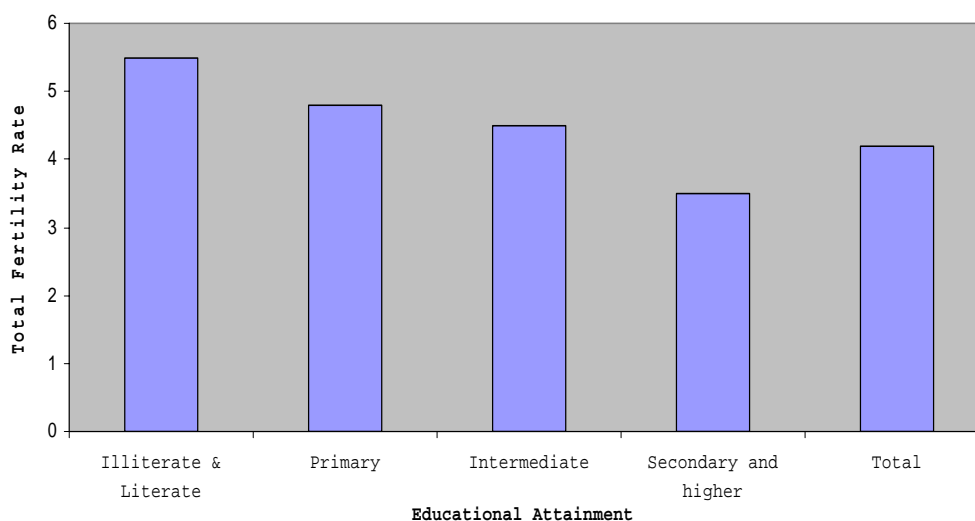
Source: National Family Survey for the Characteristics of the Native Households, 1999

Figure 12.   Percentage Distibution of TFR for Ever Married
            Emarati Women by Educational Attainment, 1999

Given the importance of knowledge about contraceptive methods and their importance in spacing births, the survey gathered information about contraceptive use for ever married Emarati Women. The majority of the ever married Emarati women have heard of contraceptives (96 per cent)

and only 55 per cent have had used one or more contraceptive methods. Among the modern contraceptives (Figure 13), most women (39.3 per cent) have used pills, the husbands of 24.3 per cent have used condoms, 22 per cent of the women have been sterilized, 18.4 per cent have used the IUD, and about 16 per cent have used contraceptive injections. Among the traditional contraceptive methods, the majority of ever married women (38 per cent) have used breastfeeding, 34 per cent have used withdrawal, and 25 per cent have used the rhythm method. Also, about 40 per cent have used other types of contraceptives without specifying these types.
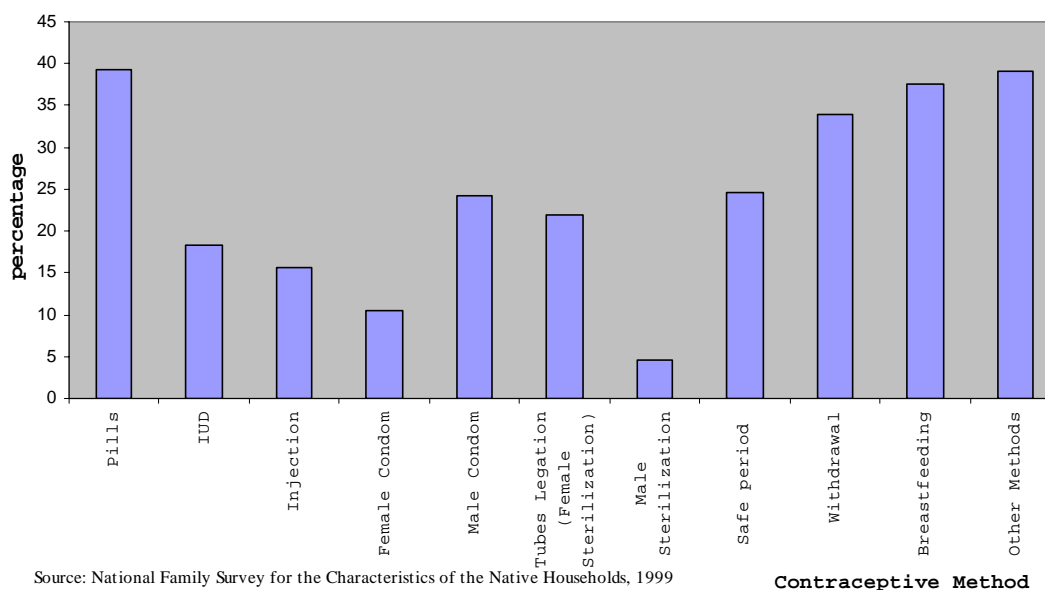
Figure 13. Percentage Distribution of Ever Married Emarati Women Who Have Practiced Contraception by Contraceptive Method,1999

The survey data also show that among the married women in the reproductive ages, only 32 per cent of them are currently practicing contraception. In each of the five-year age groups, Figure 14 shows the percentages of married women who are practicing contraception. The figure shows that most of those practicing contraception are in age groups 30-34 (36 per cent), 35 to 39 (40 per cent), and 40 to 45 (35 per cent), while the lowest percentage is found among women in the age group 15 to 19 (12 per cent). It is also higher among urban women (36 per cent) than among rural women (27 per cent), among employed women (44 per

cent) than among unemployed women (31 per cent), and among
higher educated women than lower educated women (see Figure
15). Thus, it is higher for those women with college or
higher degrees (42.2 per cent) than women with secondary
and less than college degrees (37 per cent). It is also
higher than those with primary education (32 per cent).

Source: National Family Survey for the Characteristics of the Native Households, 1999

Figure 14. Percentage Distribution of Married Emarati Women
            Whose Practicing Conterception by the Age Group,
            1999
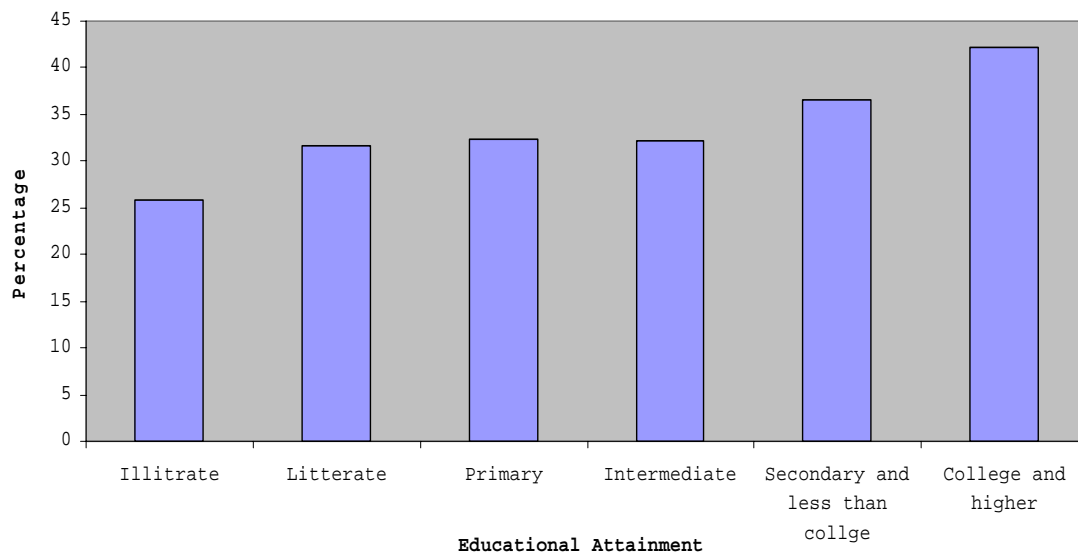
Source: National Family Survey for the Characteristics of the Native Households, 1999

Figure 15.   Percentage Distribution of Married Emarati Women Using Conteraceptives by Educational Attainment, 1999

Figure 16 shows the percentages of husbands by their age and by the number of wives. The data in this figure show that the majority of the Emarati men in each five-year age group have one wife. However, as the men become older, they tend to marry additional wives of higher ranks who are usually much younger than the husbands themselves. Also, men who live in rural areas have a higher percentage of wives of higher ranks than men who live in urban areas (Figure 17). Also, those with lower education tend to marry additional wives of higher rank than men with higher education (Figure 18).

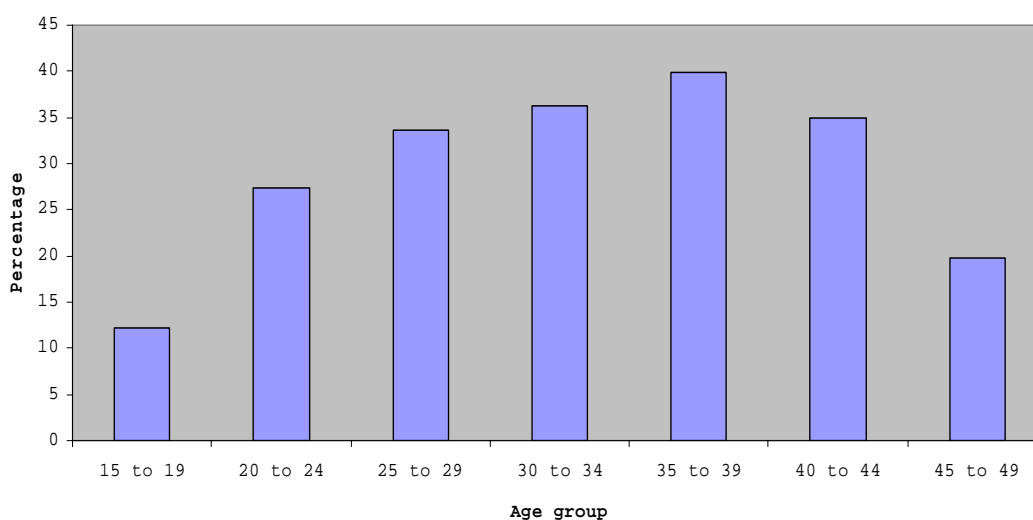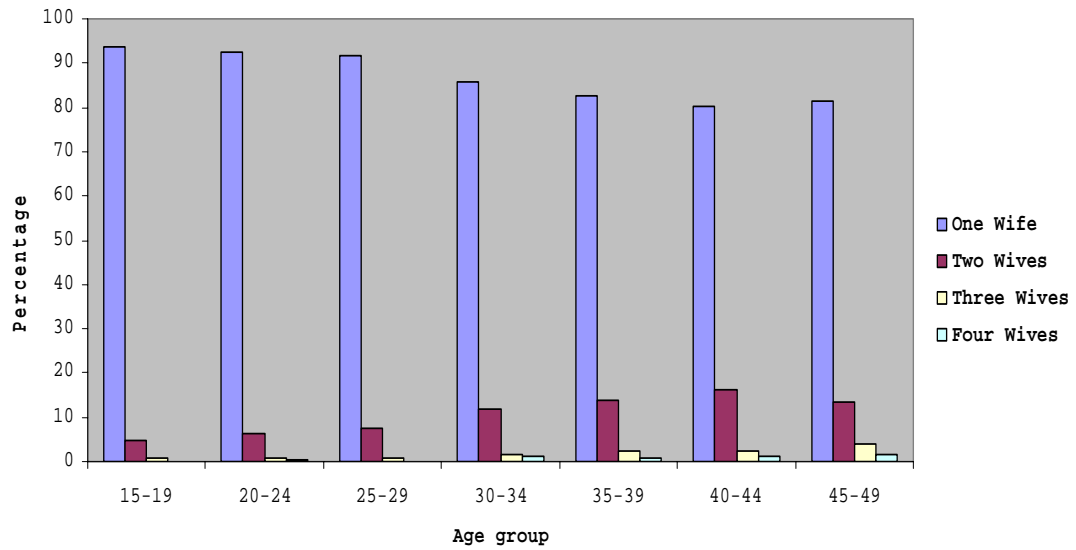Source: National Family Survey for the Characteristics of the Native Households, 1999

**Figure 16.   Percentage Distibution of Married Emarati Men by Age
and by Number of Wives, 1999**
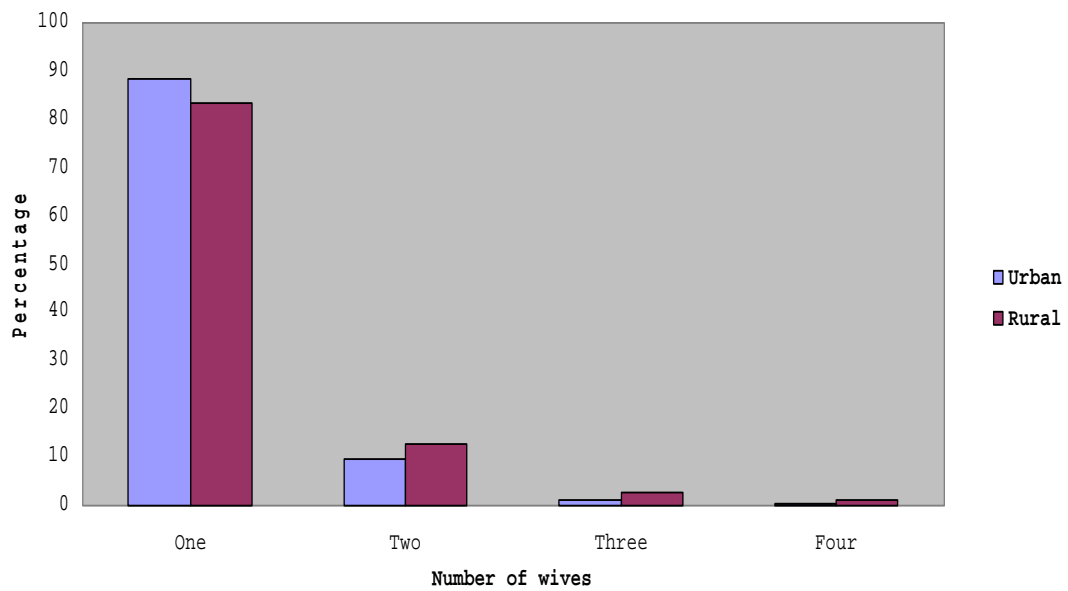
Source: National Family Survey for the Characteristics of the Native Households, 1999

**Figure 17.   Percentage Distribution of Emarati Men by Residence
and by Number of Wives, 1999**
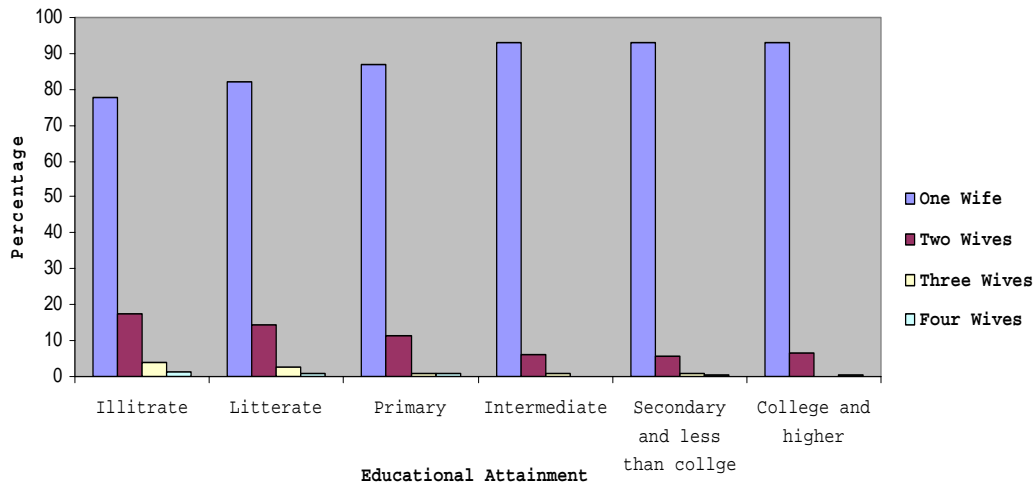
Source: National Family Survey for the Characteristics of the Native Households, 1999

Figure 18. Percentage Distribution of Married Emarati Men by
Educational Attainment and by Number of Wives, 1999

THE CHARACTERISTICS OF WIVES IN THE CURRENT STUDY

I now turn to a discussion of the characteristics of the wives and their husbands that comprise the actual sample of women I analyze in my dissertation research. These are currently married women who are only once married.

Table 11 shows the distribution of wives in all unions, monogamous unions, and polygynous unions by the various characteristics of interest. The data show that, on average, polygynous wives are older (the mean age is 34.67 years) than monogamous wives (the mean age is 31.65). Also their mean age difference with their husbands is more than

double (15 years) that of monogamous wives (6.60 years). Figure 19 shows the age differences between husbands and their wives in a five-year age groups. The data in the figure show that, overall, the age difference between a husband and his wife is larger in polygynous unions than between a husband and his wife in monogamous unions. For example, most of the monogamists (more than 40 per cent) have an age difference range of 0 to 4 years with their wives, while most of the polygynists (around 22 per cent) have an age difference range of 5 to 9 years with their wives.

Women in polygynous unions also experience, on average, a longer marriage duration (16.48 years) than women in monogamous unions (13.24 years).

Moreover, 54 per cent of polygynous wives said that they have used one or more contraceptive methods in the past, compared to 60 per cent of monogamous wives. However, the majority of polygynous wives, around 94 per cent, said they are currently using contraceptives compared to almost 88 per cent of monogamous wives. The ideal number of children is almost the same among wives in both unions. Thus, both polygynous and monogamous wives, on average, desire a family of around 6 children.

The data in Table 11 also show that there are more wives in monogamous unions living in a house with in-laws than wives in polygynous unions (42 per cent versus 33.42). They also have more housekeepers than polygynous wives (72 and 58 per cent, respectively). There are at least two possible explanations for this difference. One, wives in monogamous unions have an average education that is almost two times higher than that of wives in polygynous unions (8.40 compared to 4.94 years, receptively). Accordingly, there is a higher percentage of employed wives in monogamous unions (15.28 per cent) than in polygynous unions (9.22 per cent), which may lead these monogamous wives to require assistants to do housework and care for the children. Two, some polygynists cannot afford to have housekeepers for all of their wives, especially if they also provide separate residences for each wife. Thus, among the polygynous wives, only 39 per cent are living with another wife (or wives) in the same residence, and almost 60 per cent are living in a separate residence. Therefore, it may well be financially difficult for a husband to provide a housekeeper for each wife.

Table 11. **Distribution of Wives' Characteristics in All Unions, in Monogamous and Polygynous Unions**

Characteristics	All Unions	Monogamous Unions	Polygynous Unions
Age groups (%)			
15-19	4.00	4.30	1.75
20-24	17.93	18.99	9.98
25-29	20.43	21.26	14.21
30-34	18.22	17.93	20.45
35-39	17.08	16.36	22.44
40-44	14.52	13.66	20.95
45-49	7.82	7.50	10.22
Mean age of wife	32.00	31.65	34.67
Mean age difference between spouses	7.58	6.60	15.00
Mean duration of marriage	13.62	13.24	16.48
Mean education (in years)	7.99	8.40	4.94
Employed (%)	14.52	15.28	9.22
Ever used contraceptives (%)	59.05	60.00	54.11
Currently using contraceptives[a]	88.24	87.55	94.00
Co_residence with (%):			
A member from in-laws	40.65	41.62	33.42
A member from wife's family	12.96	13.00	12.72
Another wife (or wives)	4.97	0.40	39.15
A non-relative person	2.53	2.43	3.24
A housekeepers (males or females)	70.52	72.18	58.10
Mean ideal family Size[b]	6.31	6.27	6.62
Number of wives	3,402	3,001	401

[a] Based on 2,008 women only: 1,791 for monogamous and 217 for polygynous women

[b] Based on 2,983 women only: 2,632 for monogamous and 351 for monogamous women.

Source: National Family Survey for the Characteristics of the Native Households, 1999

Age difference= age of husband-age of wife (in years).

Source: National Family Survey for the Characteristics of the Native Households, 1999

Figure 19.   Percentage Distribution of Age Difference between Husbands and Wives by Type of Union, 1999

Table 12 shows the distribution of husbands'
characteristics in all unions, monogamous unions, and
polygynous unions for the various characteristics of
interest. Polygynists have lower mean years of completed
education (4.99 years) than monogamists (8.80 years), and a
lower percentage of them are employed (75 per cent) than
monogamists (85 per cent); this difference could be
explained by their older ages, many of them already in
their retirement ages. In Figure 20 and Figure 21, also, we
see that as men become older, they marry additional wives.

The data in Table 12 also show that the majority of polygynists are married to two wives, and not to more. Thus, 82 per cent of them are married to two wives, 12 per cent to three wives, and 6.23 per cent to four wives. Besides their current Emarati wives (the participants in my sample), around 62 per cent of polygynists have another Emarati wife, 8.5 per cent have two additional Emarati wives, and 6.2 per cent have three additional Emarati wives, compared to almost 26 per cent of polygynists who do not have an additional Emarati wife. On the other hand, almost 29 per cent of polygynists who have an additional non-Emarati wife, 4.5 per cent have two additional non-Emarati wives, and very few (0.25 per cent) have three additional non-Emarati wives, compared to 66 per cent of polygynists who have no additional non-Emarati wives.
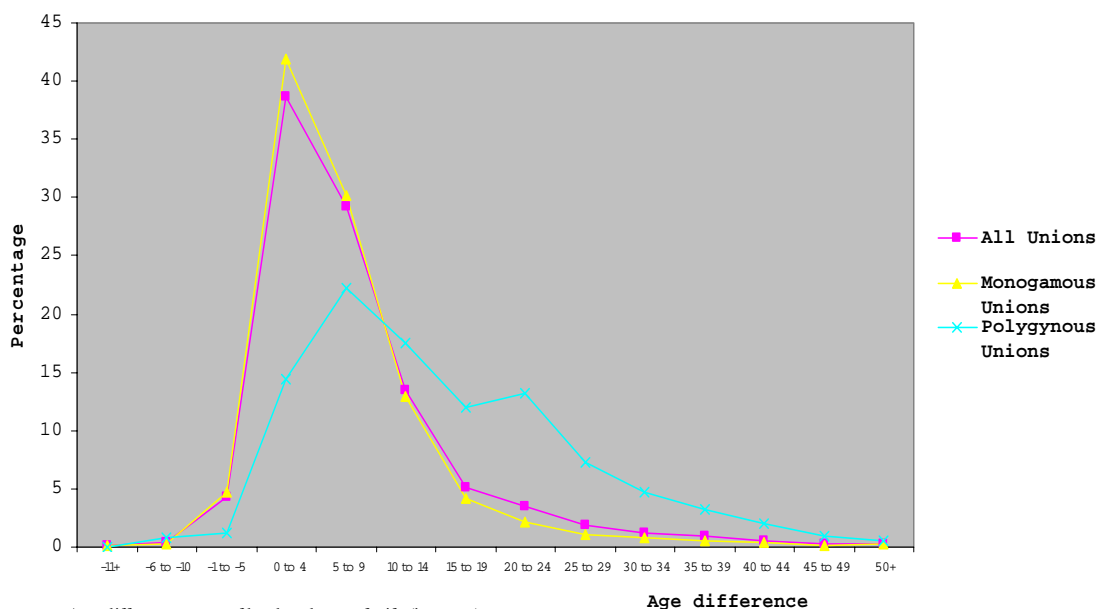
Table 12. Distribution of Husbands' Characteristics in All
           Unions, in Monogamous and Polygynous Union

Characteristics	All Unions	Monogamous Unions	Polygynous Unions
Age groups (%)			
15-19	.47	.53	-
20-24	7.44	8.33	.75
25-29	17.20	18.93	4.24
30-34	14.84	16.06	5.74
35-39	14.76	15.43	9.73
40-44	11.93	11.66	13.97
45-49	11.55	11.23	13.97
50-54	8.00	6.86	16.46
55-59	5.32	4.50	11.47
60+	8.50	6.46	23.69
Mean education	8.35	8.80	4.99
Employment status (%)	83.74	84.91	75.06
The current number of wives (%):			
Two wives			82.04
Three wives			11.72
Four wives			6.23
Number of national (Emarati) wives (other than the participant) (%):			26.43
None			61.85
One wife			8.48
Two wives			3.24
Three wives			
Number of non-national (non-Emarati) wives (other than the participant)(%):			65.84
None			29.43
One wife			4.49
Two wives			0.25
Three wives			
Number of husbands	3,402	3,001	401

Source: National Family Survey for the Characteristics of the Native
Households, 1999

Source: National Family Survey for the Characteristics of the Native Households, 1999

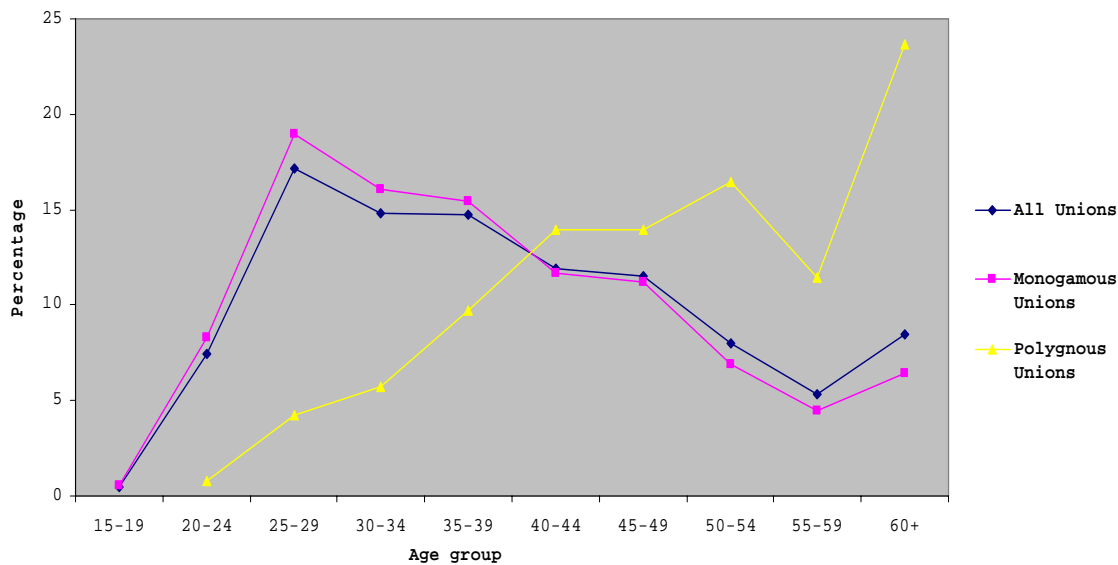**Figure 20. Percentage Distribution of Husbands' Age by Type of Union, 1999**
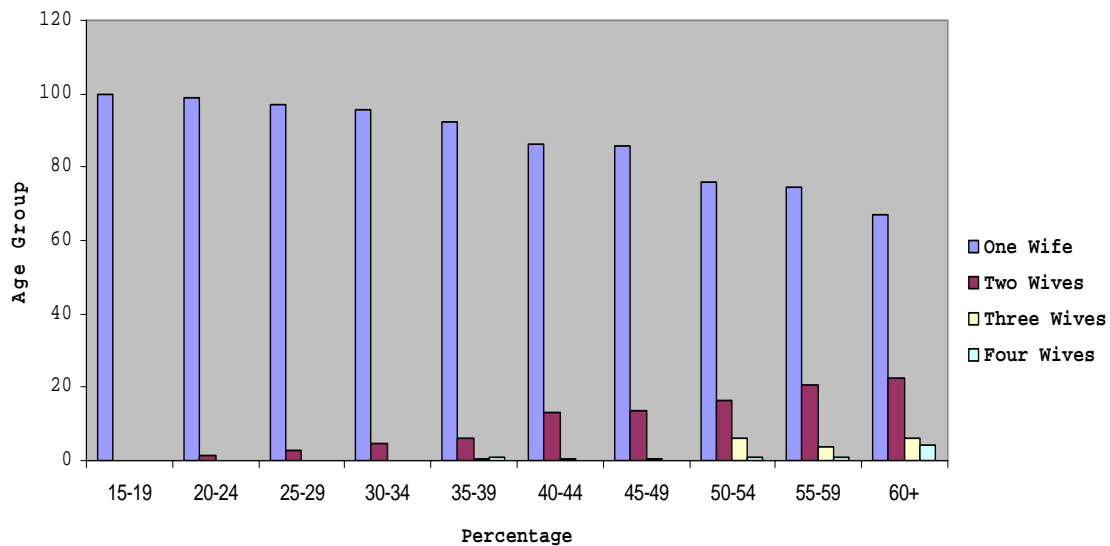
Source: National Family Survey for the Characteristics of the Native Households, 1999

Figure 21. Percentage Distribution of Emarati Married Men by Age and by Current Number of Wives, 1999

Regarding the employment of the husbands, Figure 22 also shows that the highest proportions of polygynists are in the 'military' (27 per cent) and are 'salesmen and other services' (21 per cent). Relatively lower proportions are found among 'general laborers' (14 per cent) and 'legislators, executives, and managers' (13 per cent). In contrast, the lowest percentage of polygynously married men are found among 'craftsmen,' 'technicians,' 'farmers, cattlemen, fishermen, and hunters,' and 'clericals.'
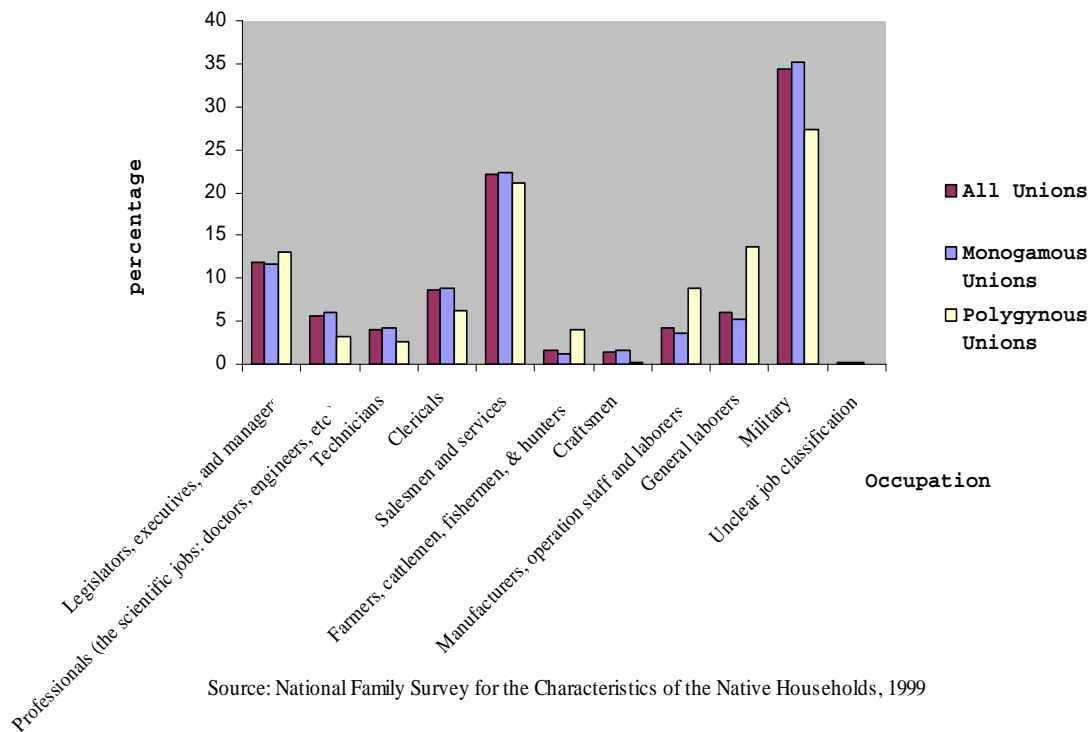
Source: National Family Survey for the Characteristics of the Native Households, 1999

Figure 22.   Percentage Distribution of Emarati
            Polygynists by Occupation, 1999

The next CHAPTER will report the results of my Logistic Regression models for births occurring in the last 12 months.

CHAPTER VI

THE OCCURRENCE OF A BIRTH IN THE LAST 12 MONTHS

In this chapter, I present and discuss the results of Logistic regression models predicting for each woman her likelihood of having a baby in the past 12 months. I begin the chapter outlining my general expectations I have regard to the relationship between polygyny and occurrence of a birth in the past 12 months. Here my major prediction is that polygynous wives will have higher fertility than monogamous wives. I discuss the theoretical rationale for my predication in the next section. Then I discuss briefly the general issue of logistic regression. Then I present and discuss the results of my regression models.

THEORTICAL RATIONALE

I expect to observe a positive relationship between polygyny and women's current fertility, that is, her likelihood of having a baby in the past 12 months. This prediction is based on the Male Demand for Progeny Model (as discussed in an earlier chapter), which implies that, on average, polygynous wives will have more children than monogamous wives. Thus, men marry additional wives mainly to satisfy their desire for a large number of children.

This desire for children may also create competition among wives in polygynous unions to bear more children (Olusanya 1971; Young 1954)so to be able to meet their husbands' demands for children. However, the fertility of more recent wives may be affected by earlier wives saturating both the demand for children and the ability to provide for offspring. Thus, some studies do indeed show that higher-order wives tend to have fewer children than lower-order wives. Also, as Anderton and Emigh (1989) argue, "the demand for progeny manifests itself more clearly in the later life course, where the fertility of earlier marriages is largely determined and affects the continuing fertility of more recent wives." (1989: 852)

A fairly consistent finding in the literature appears to be that the relationship between polygyny and fertility is negative in many African societies, among the Mormons, and in other societies. More precisely, this literature reports that higher-order wives have lower fertility than lower-order wives. My expectation of the opposite, i.e., a positive relationship between polygyny and fertility in the UAE is based on many reasons which are not found, to a large extent, in many African societies. These reasons are social, economic, and biological.

I have already discussed these reasons in CHAPTER III, and I do so in more detail in this chapter. First, Emarati men are financially better-off and can provide the financial costs of having more than one wife, including housing and outlay for each wife and her children. polygynist Emarati men also tend to have less education that their monogamous counterparts. Thus, the study population of this dissertation shows that the husbands of polygynous wives have a lower mean of education (4.99 years) than the husbands of monogamous wives (8.80 years.); this might positively affect their wives' fertility. Second, unlike some women in other societies where intercourse during pregnancy and the postpartum period is frequently forbidden by customs and taboos, Emarati women usually do not have such customs and taboos. The sexual abstinence for Emarati women does not exceed 40 days from the birth of a child, compared, for example, with Ibadan (Nigerian) women who have a mean period of postnatal abstinent of around 22 months: 24 months for women in polygynous marriages versus 20 months for women in monogamous marriages (Ware 1975). Third, the overall duration of breastfeeding for Emarati women is, to a great extent, shorter than that of other societies, such as the

African societies in which the duration of breastfeeding may last as long as three years. Thus, According to Musaiger (1992), the mean duration of breastfeeding for UAE women is 8.1 months: 6.7 for employed women and 8.3 for unemployed women. Fourth, unlike other polygynists in other societies, over 83 percent of Emarati polygynists are married to no more than two wives. So, Emarati polygynists can divide their time among their wives and, presumably increase sexual competition and increase the risk of pregnancy for each wife. Moreover, even if the wives do not live in the same residence, which according to the coital frequency model should decrease the fertility of each woman, the spatial distance between the homes of each wife is usually not an issue in the UAE with the modern transportation and with the fact that wives are usually living within close proximity to one another even if they have separate residences. Fifth, unlike earlier studies that have showed a negative impact of polygyny on women's fertility in some Arab societies, the recent studies have shown that polygyny has a positive effect on women's fertility, such as studies that have been conducted in Jordan (Sueyoshi and Ohtsuka 2003) .

My predictions of secondary interest are 1) as the age of husband increases, the fertility of the wife will decrease; 2) if a wife co-resides with another wife (or wives) she will have higher fertility; and 3) the fertility of the wife will decrease with the number of wives in the union. All my hypotheses are tested controlling for numerous biological and social influences.

LOGISTIC REGRESSION MODELS

The occurrence of a birth for a wife in the last 12 months is a dichotomous (i.e., binary) variable, scored 1 if a woman has had a birth in the 12 months preceding the date of the survey, and 0 if not. Since I will be incorporating several continuous variables in my models as independent variables (e.g. duration of marriage, age at first marriage, etc.), logistic regression permits the estimation of probabilities in models containing continuous and/or categorical independent variables. The logistic regression model also converts the dependent variable, i.e., the occurrence of a birth in the last 12 months, into a logit, or the natural logarithm of the odds of success. The mean is the proportion of times that the dependent variable receives the value of 1, that is, giving birth in the last 12 months.

I have already reviewed and discussed in CHAPTER IV the logistics regression model in more detail, so I will not repeat that discussion here.

The key independent variable is a dummy variable scored 1 if the woman is currently married to a polygynist, and 0 if not. As previously noted, in my sample of married Emarati women, 12 per cent of the women are currently married to polygynists.

RESULTS

I include nine models to test the polygyny effect on fertility for married Emarati women. Table 13 presents the results of progressively more inclusive logistic regression models predicting the log odds of currently once married women having had a birth in the past 12 months. I exponentiated the logistic coefficients, so they are expressed as odds ratios. Model 1 includes only the polygyny dummy variable, scored 1 if the woman is currently in a polygynous marriage. As seen in Model 1, the odds ratio of polygyny variable is not statistically significant. There is no difference between polygynous and monogamous women in the odds ratios of having a birth in the past 12 months.

Model 2 adds a second variable to the equation, the age of the husband; I expect that this variable should have a negative effect on the likelihood of the wife having a recent birth; the older the husband, the less the likelihood. Most importantly, in the equation in Model 2, the polygyny variable now becomes, as predicted, positive and is statistically significant. The odds ratio of 1.62 means that the odds of polygynous wives having had a birth in the past 12 months are 62 per cent greater than the odds of monogamous wives, controlling for the age of the husband.

Model 3 adds another independent variable to the logistic regression equation, namely, woman's age at first marriage. This variable is added as a control. Even after adding woman's age at first marriage, the polygyny variable maintains its positive effect and statistical significance, with an odds ratio of 1.60. Polygynous wives have odds of having a birth in the past 12 months that are 60 per cent greater than the odds of monogamous wives, controlling for both husband's age and wife's age at first marriage.

In Model 4, I added four socioeconomic variables to the equation, namely, wife's completed education, whether the wife is employed outside the home, whether the family

lives in an urban area, and husband's completed education. Once again, and very importantly, the positive and statistically significant effect of the polygyny variable is sustained. Its odds ratio is 1.56, which means that polygynous wives have odds of having had a baby born to them in the past 12 months that are 56 per cent greater than the respective odds of monogamous wives, controlling for husband's age, his education, wife's education, her age at marriage, whether she employed outside the home, and whether the couple resides in an urban area.

When I add a biological variable to the equation in Model 5, that is, age at menarche (in years), the magnitude of the polygyny variable does not change much. Thus, its odds ratio is 1.559, meaning that polygynous wives have odds of having had a baby born to them in the past 12 months that are 56 per cent greater than the respective odds of monogamous wives, controlling for husband's age, his education, wife's education, her age at marriage, whether the she works outside the home, her age at menarche, and whether the couple resides in an urban area.

Moving to Model 6, I added woman's acceptance of marriage as a control variable, that is, whether a woman agreed to marry her husband. The magnitude of the polygyny

variable hardly changes at all from its value in Model 5. Its odds ratio is 1.56, meaning that, as in Model 5, polygynous wives have odds of having had a baby born to them in the past 12 months that are 56 per cent greater than the odds of monogamous wives, holding the other variables constant.

In Model 7, I added one more independent variable that is expected to have an influential effect on woman's fertility, that is, whether a woman has ever used any birth control method in the past; this is a dummy variable, coded 1 if yes. Again, the polygyny variable maintains its positive effect and statistical significance, with an odds ratio that does not change much from Model 6.

Model 8 includes another independent variable that is shown to have a significant effect on the fertility of polygynous women (Garenne and Van de Walle 1989), that is, whether a woman co-resides with another wife (or wives). Around 39 per cent of women in my sample do co-reside with another wife (or wives). The results in Model 8 show that even when controlling for whether a woman co-resides with another wife (or wives), the effect and statistical significance of the polygyny variable is sustained.

Model 9 is the final model and it includes all the previous independent variables along with controls for the number of wives in the union. When I control for the number of wives in the union, the polygyny variable loses its significant positive impact on whether a birth occurred in the last 12 months. Thus, the odds of having a birth in the last 12 months for polygynous wives are not statistically different than the odds of having a birth in the last 12 months for monogamous wives, controlling for the number of wives in the unions and the other previous independent variables.

The final column of Table 13 presents the semi-standardized log odds coefficients for Model 9. These semi-standardized log odds coefficients enable us to compare the magnitude of the partial slopes of each variable on the dependent variable by standardizing the slope so that each coefficient is now based on the same metric. For instance, the standardizing of the slopes allows us to see how much influence each variable has on woman's likelihood of having a birth in the last 12 months. Husband's age, indeed, has the largest (absolute) influence on the woman's likelihood of having a birth in the last 12 months. Its value of -0.755 means that a one standard deviation change in

husband's age will result in a 53 per cent decrease in the log odds for a woman having a birth in the last 12 months, holding constant the effects of the other 11 covariates. The second largest influence on the woman's likelihood of having a birth in the last 12 months is the number of wives in the union. Thus, its value of 0.182 means that a one standard deviation increase in the number of wives in the union results in a 20 per cent increase in the log odds of a woman having a birth in the last 12 months, holding constant the effect of the other 11 covariates. Viewed together, these semi-standardized log odds coefficients indicate that the most influential covariates on the woman's likelihood of having a birth in the last 12 months after age of the husband and the number of wives in the union are: third, woman's work outside home (-0.107); fourth, age at first marriage (0.106); and fifth, wife's education (0.073). The analysis surprisingly shows that being in co-residence with another wife (or wives) has no effect on the current fertility of women.

At the bottom of the table I report values for each model of Pseduo R^2 and its log likelihood. Both statistics provide information about how well the data fit the model.

Table 13. Logistic Regression Models of the Effect of Currently Being in a Polygynous Union, versus in a Monogamous Union, On the Log Odds of Having a Child in the Last 12 Months for the Emarati Married Women, 1999

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Polygynous Union (yes=1)	0.828 (0.105)	1.620* (0.227)	1.596* (0.224)	1.557* (0.220)	1.559* (0.221)	1.564* (0.221)
Age of Husband		0.941* (0.004)	0.943* (0.004)	0.945* (0.005)	0.945* (0.005)	0.945* (0.005)
Age at 1st Marriage			1.024* (0.011)	1.032* (0.013)	1.033* (0.013)	1.032* (0.013)
Woman's completed Education (in years)				1.013 (0.010)	1.013 (0.010)	1.013 (0.010)
Employed Woman Outside Home (yes=1)				0.721* (0.096)	0.721* (0.096)	0.720* (0.096)
Urban Residence (yes=1)				0.881 (0.081)	0.875 (0.080)	0.872 (0.080)
Husband's Completed Education				0.996 (0.008)	0.996 (0.008)	0.996 (0.008)
Age at Menarche (in years)					0.974 (0.034)	0.974 (0.034)
Marriage Acceptance (yes=1)						1.267 (0.423)
Ever Used Contraceptives (yes=1)						
Co-residence with another wife(or wives) (yes=1)						
Number of Wives in the union						
Pseduo R^2	0.001	0.067	0.0684	0.0706	0.0707	0.0709
Log Likelihood	-1920.1	-1792.4	-1789.9	-1785.6	-1785.3	-1785.1

Table 13. Continued

Independent Variable	Model 7	Model 8	Model 9	Semi-Standardized Log Odds Coefficient**
Polygynous Union (yes=1)	1.562* (0.221)	1.531* (0.256)	1.208 (0.221)	0.061
Age of Husband	0.945* (0.005)	0.945* (0.005)	0.942* (0.005)	-0.755
Age at 1st Marriage	1.032* (0.013)	1.031* (0.128)	1.027* (0.013)	0.106
Woman's completed Education (in years)	1.013 (0.010)	1.013 (0.010)	1.012 (0.010)	0.073
Employed Woman Outside Home (yes=1)	0.720* (0.097)	0.721* (0.097)	0.737* (0.099)	-0.107
Urban Residence (yes=1)	0.873 (0.008)	0.874 (0.080)	0.881 (0.082)	-0.059
Husband's Completed Education	0.996 (0.008)	0.996 (0.008)	0.998 (0.008)	-0.012
Age at Menarche (in years)	0.974 (0.034)	0.974 (0.034)	0.976 (0.034)	-0.029
Marriage Acceptance (yes=1)	1.267 (0.422)	1.264 (0.422)	1.294 (0.432)	0.037
Ever Used Contraceptives (yes=1)	0.982 0.084	0.983 (0.084)	0.989 (0.085)	-0.006
Co-residence with other wife(or wives) (yes=1)		1.058 (0.262)	1.001 (0.250)	0.000
Number of Wives in the union			1.536* (0.193)	0.182
Pseduo R^2	0.0709	0.0709	0.0738	
Log Likelihood	-1785.1	-1785.0	-1779.4	

Note: Numbers in parentheses are standard error
* p<0.05
**Semi-standardized log odds coefficients apply only to Model 9

DISCUSSION

In the first 8 models, after controlling for the numerous biological and social variables, the polygyny variable is significant and positive in predicting current fertility, that is, the likelihood of the occurrence of a birth in the last 12 months. This is consistent with my hypothesis that polygyny has a significant positive effect on woman's fertility. However, the final model shows that when controlling for the number of wives in the union, the polygyny variable has no significant positive effect on woman's current fertility. In addition, in this last model, even though the polygynous union variable is not statistically significant, its semi-standardized coefficient is still greater than some of the biological social factors such as husband's education, age at menarche, residing in urban area, agreed to marry the husband, using contraceptives in the past, and co-residing with another wife (or wives).

For my other three hypotheses, namely, my prediction of the negative effect of husband's age, the positive effect of a wife being in co-residence with another wife (or wives), and the negative effect of the number of wives in the union, on the likelihood of occurrence of a birth in

the last 12 months, only the husband's age variable has a statistically significant effect in the predicted direction. For instance, as expected, Model 9 shows that when the husband's age increases by one year, the probability of occurrence of a birth in the last 12 months decreases by 6 per cent, controlling for the other variables.

However, Model 9 indicates that my third hypothesis, namely that co-residing with another wife (or wives) should have a positive effect on woman's current fertility, is not confirmed. Thus Model 9 shows that co-residing of a wife with another wife (or wives) has the same expected direction (positive), but this effect is not significant on predicting the probability of a wife having a birth in the last 12 months, controlling for the other variables.

Also, Model 9 shows that my fourth hypothesis, namely that as the number of wives in the union increases, wife's fertility will decrease, is not confirmed. Indeed, the analysis shows an opposite effect, that is, the fertility of the wife will increase with the number of wives in the union. For instance, when the number of wives of a polygynist increases by one wife, the probability of the

occurrence of a birth increases by 54 per cent, controlling for the other variables.

I will discuss some of these results here, and will do so more fully in the last chapter of this dissertation. One can explain this result in part by referring to the demand for progeny theory, which states that men marry additional wives mainly to satisfy their desire for a large number of progeny (Muhsam 1956; Chojnacka 1980; Ukaegbu 1981). Thus, one of the main reasons for men to have multiple marriages is to have more children (Blance and Gage 2000). The theory also states, however, that the fertility of more recent wives may be affected by a declining demand for children as the stock of progeny by earlier wives saturates both the demand for children and the ability to provide for offspring (Anderton and Emigh 1989).

Among the Emarati married men, unlike many other populations such as those in Africa, the majority of polygynists are married to two wives, and not to more. For instance, 82 per cent of Emarati men who are polygynists are married to two wives, 12 per cent to three wives, and 6 per cent to four wives. This may well explain why that the majority of polygynists can divide their time among their wives and, presumably increase sexual competition and

increase the risk of pregnancy for each wife; most of them have only two wives.

In addition, even if the wives do not live in the same residence, which according to the coital frequency model should decrease the fertility of each woman, the spatial distance between the homes of each wife is usually not an issue in the UAE with the modern transportations and with the fact that wives are usually living within close proximity to one another even if they have separate residences.

My results also show that wife's age at marriage and working outside the house have a significant influence on her current fertility. Thus, as woman's age at first marriage increases, her fertility is shown to increase by 3 per cent, controlling for the other variables. In contrast, working outside the home is shown to decrease women's current fertility by 26 per cent, controlling for the other variables.

The model also shows that my other variables, namely, whether a couple resides in an urban area, the wife's age at menarche, her acceptance to marry her husband, her husband's education, and whether she has ever used

contraceptives, do not have any significant effects on her current fertility.

In the next chapter, I will report the results of the effect of polygyny on cumulative fertility. My dependent variable will be the number of children ever born (CEB) to the woman. Since CEB is a count variable, my regression models in the next chapter will be estimated using Negative Binomial Regression.

CHAPTER VII

CHILDREN EVER BORN

In this chapter, I present and discuss the results of Negative Binomial regression models predicting for each woman her number of children ever born (CEB). I begin the chapter outlining my general expectations with regard to the relationship between polygyny and CEB. As was the case in the previous chapter where I expected and reported a positive association between polygyny and current fertility (whether the woman had a baby in the past 12 months), in this chapter I expect also to find a positive association between polygyny and CEB. I discuss these theoretical issues in the next section. Then I discuss briefly the general issue of count regression and some of the statistical issues leading to my decision to estimate negative binomial models. Then I present and discuss the results of my regression models.

THEORETICAL RATIONALE

As the case in the previous chapter where I expected and reported a positive association between polygyny and women's current fertility, in this chapter I also expect to observe a positive association between polygyny and women's

cumulative fertility. My theoretical rationale is based on the Male Demand for Progeny Model (as discussed in an earlier chapter), which assumes that, on average, polygynous wives will have more children than monogamous wives. It argues that men marry additional wives mainly to satisfy their desire for a large number of progeny. This desire for children may also create competition among wives in polygynous unions to bear more children (Olusanya 1971; Young 1954) so to be able to meet their husbands' demands for children. However, the fertility of more recent wives may be affected by earlier wives saturating both the demand for children and the ability to provide for offspring. Thus, some studies do indeed show that higher-order wives tend to have fewer children than lower-order wives.

A fairly consistent finding in the literature appears to be that the relationship between polygyny and fertility is negative in many African societies, among the Mormons, and in other societies. More precisely, this literature reports that higher-order wives have lower fertility than lower-order wives. My expectation of the opposite, i.e., a positive relationship between polygyny and fertility in the UAE is based on many reasons which are not found, to a large extent, in many African societies. These reasons are

social, economic and biological. I have already reviewed and discussed in CHAPTER III and CHAPTER VI these reasons so I will not repeat that discussion here.

COUNT REGRESSION MODELS

Children ever born is a count variable. Ordinary least squares regression (OLS) is usually not an appropriate method for analyzing a count, unless the count is independently and identically distributed. Long and Freese (2003) have written that while "the linear regression model has often been applied to count outcomes, this can result in inefficient, inconsistent and biased estimates ... It is (thus) much safer to use models specifically designed for count outcomes" (2003: 244)

Among the many models that are appropriate for analyzing counts, the Poisson regression model and the Negative Binomial regression model are the principal ones. Negative Binomial regression is preferred over Poisson regression when there is overdispersion of the dependent variable, that is, the variance is significantly greater than the mean. It turns out that this is the situation with my dependent variable. Indeed when I estimate the full model using Negative Binomial regression, I will be able to determine statistically if there is evidence of

overdispersion in the model. If the alpha coefficient is significant, this means that there is a significant amount of overdispersion and Negative Binomial is the appropriate choice over the Poisson regression (Long and Freese, 2003).

I have already reviewed and discussed in CHAPTER IV these two major count regression models, so I will not repeat that discussion here.

I have estimated Negative Binomial regression models of children ever born for married Emarati women and have determined that the Negative Binomial approach is the appropriate method.

RESULTS

Like the situation in the previous chapter when I estimated the occurrence of a birth in the last 12 months, my major prediction here is that polygynous wives will have higher CEB than monogamous wives. Some of my predictions of secondary interest are similar to that of the previous chapter, except that I will not be able to examine in my analysis here the predication that if a wife co-resides with another wife (or wives), she will have higher fertility. The reason is that the wife's co-residence variable in my data only refers to her current residence, that is, whether she is currently living with another wife

(or wives), not her past co-residence status. In other words, it is not possible to draw inferences from the direct comparison of cumulative fertility (i.e. children ever born to women) and their co-residence status at the time of survey because this may not reflect their residence status at the time of their past conceptions. But I will be able to examine my other two predictions, namely as the age of husband increases, the fertility of the wife will decrease; and the fertility of the wife will decrease with the number of wives in the union. All these hypotheses are tested controlling for numerous biological and social influences.

I estimate a series of Negative Binomial models that examine the direct effect of polygyny and the control covariates on number of children ever born to married Emarati women. Table 14 presents the results of seven nested Negative Binomial models. The first model has only one variable, polygyny; the second model includes polygyny and age of the husband; the third model includes polygyny, age of the husband, and wife's age at first marriage; the fourth model adds to the previous variables whether the couple resides in an urban area; the fifth model adds the additional variable of whether the wife agreed to be

married her husband; the sixth model adds a biological variable, wive's age at menarche, and the last model includes all the previous variables along with controls for the number of wives in the union.

The results in Model 1 show the expected relationship, namely that polygyny is significantly associated in a positive direction with the number of children ever born; the Negative Binomial coefficient is 0.200. If I exponentiate the coefficient, I obtain an odds ratio of 1.221; this means that polygynous wives, on average, have 22 per cent more children ever born to them than monogamous wives.

However, once I begin introducing control variables into the model, the positive association shown in Model 1 became negative. Thus, in Model 2 I added age of the husband as a second variable. The age of the husband shows unexpected positive association. Thus, as the age of the husband increases, the number of children ever born to their wives decreases. But the more important point is that with age of the husband now included in the model, the polygyny variable no longer has a positive effect on the number of children ever born to women; the relationship is now negative and statistically significant.

Model 3 adds another independent variable to the Negative Binomial equation, namely, woman's age at first marriage. This variable is added as a control. Even after adding woman's age at first marriage, the polygyny variable maintains its negative and statistically significant effect. Being in a polygynous union for a wife, versus being in a monogamous union, decreases the number of her children ever born by 9 per cent; controlling for age of the husband.

After adding another control variable in Model 4, that is, whether the family lives in an urban area (coded 1 if yes), the polygyny variable still maintains its negative significant effect on the children ever born; its magnitude does not change much from Model 3.

When I added a biological variable to the equation in Model 5, age at menarche (in years), the polygyny variable maintains its negative effect and statistical significance; with a coefficient of -0.108.

Moving to Model 6, I added whether a woman agreed to marry her husband, as a fifth control variable. Once again the magnitude of the polygyny variable hardly changes at all from its value in Models 4 and 5. Its coefficient of -0.109 has an odds ratio of 0.898. This means that being in

a polygynous union, versus being in a monogamous union, decreases the number of children ever born by almost 10 per cent, controlling for a host of independent variables.

Model 7 is the full model and it includes all the previous independent variables along with controls for the number of wives in the union. When I control for the number of wives in the union, the polygyny variable loses its significant negative effect on children ever born. Thus, the production of CEB does not significantly vary between wives in polygynous unions and wives in monogamous unions, controlling for the number of wives in the unions and all the other previous independent variables.

This intriguing relationship deserves additional discussion. It would appear from my statistical analysis that a key reason for the demonstrated negative association between polygyny and CEB is the number of wives in the marriage. The more the number of wives, the less the CEB. I address in more detail in the next chapter some of the implications of this intriguing relationship.

The last two columns of Table 14 present the semi-standardized odds ratios and their percentage change values for Model 7. These semi-standardized odds ratios indicate that age of the husband is the most influential covariate

predicting the children ever born to women, followed by age at first marriage, number of the wives in the union, whether the couple resides in an urban area, age at menarche, whether wife accepts to marry her husband, and lastly whether the wife is in polygynous union.

At the bottom of the table I report the Pseduo R^2 values for each model; this provides information about how well the model fits the data. The results of the Pseduo R^2 indicate that as I add more independent variables to the model, the better the model fit. Thus, the more complex model (Model 7, i.e., with seven independent variables) is a better fit than the other simpler models (Model 1 to 6).

Table 14. **Negative Binomial Regression Models of the Effect of Currently Being in a Polygynous Union, versus in a Monogamous Union, On the Children Ever Born for the Emarati Married Women, 1999**

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Polygynous Union (yes=1)	0.200* (0.041)	-0.1615* (0.0353)	-0.102* (0.032)	-0.109* (0.032)	-0.108* (0.032)	-0.109* (0.032)
Age of Husband		0.038* (0.001)	0.030* (0.001)	0.030* (0.001)	0.030 (0.001)	0.030* (0.001)
Age at 1st Marriage			-0.067* (0.003)	-0.067* (0.003)	-0.068* (0.003)	1.032* (0.013)
Urban Residence (yes=1)				-0.082* (0.022)	-0.076* (0.022)	-0.075* (0.022)
Age at Menarche (in years)					0.022* (0.009)	0.022* (0.009)
Marriage Acceptance (yes=1)						-0.058 (0.080)
Number of Wives in the union						
Constant	1.565*	0.023	1.523*	1.549*	1.277*	1.331*
Pseduo R^2	0.0014	0.0736	0.1025	0.1033	0.1036	0.1037

Table 14. Continued

Independent Variable	Model 7	Odds Ratios**	Semi-Standardized Odds Ratios**	Percentage Change in Semi-Standardized Odds Ratios
Polygynous Union (yes=1)	0.011 (0.036)	1.011	1.004	0.4
Age of Husband	0.032* (0.001)	1.033	1.499	50.0
Age at 1st Marriage	-0.065* (0.003)	0.937	0.775	-22.5
Urban Residence (yes=1)	-0.083* (0.022)	0.921	0.962	-3.8
Age at Menarche (in years	0.020* (0.009)	1.020	1.024	2.4
Marriage Acceptance (yes=1)	-0.077 (0.065)	0.926	0.989	-1.1
Number of Wives in the union	-0.216* (0.029)	0.806	0.913	-8.7
Constant	1.480*			
Pseduo R^2	0.1069			

Note: Numbers in parentheses are the standard errors.
    * $p<0.05$
    ** Odds ratios and semi-standardized odds ratios apply only to Model 7

DISCUSSION

In the first 5 models, after controlling for the numerous biological and social variables, the polygyny variable was shown to be significant and negative in predicting the cumulative fertility of married Emarati women, i.e., the children ever born to married Emarati women. This is inconsistent with my major hypothesis that polygyny has a significant positive effect on woman's fertility. However, the final model shows that the polygyny variable, as expected, has a positive effect, but this effect is not significant when controlling for the number of wives in the union. In other words, when I control for number of wives, the negative association of polygyny and CEB disappears. In addition to its insignificant effect on woman's cumulative fertility, the semi-standardized odds ratios in the last model show that polygyny has the least influential effect on woman's fertility.

One of the explanations in the literature, mainly from African countries, for the negative association between polygyny and CEB is the number of wives in the marriage. The more the number of wives in the union, the less the CEB. Garenne and Van de Walle (1989) have demonstrated

that the mechanism through which polygyny lower women's fertility is that polygyny monopolizes younger women for the benefit of older men. Thus, as the number of wives increases, the age difference between the spouses increases, while male fecundity decreases with age.

This hypothesis is confirmed when I examined the relationship between number of wives in the union and age differences between spouses in my study population. Thus, among the Emarati married women, when the number of wives increases in the union, the age differences between spouses increases, controlling for numerous social and biological variables.

Also, in their study, Garenne and Van de Walle (1989) have showed that the decline of female fertility with increasing number of wives is mostly accounted for by the effect of the age of the husband. This probably explains the negative association between polygyny and Emarati women's cumulative fertility, when controlling for both age of the husband and number of wives in the union. This is also confirmed when I have estimated the same model (i.e. Model 7) using age difference between spouses as a control variable instead of age of the husband (because of multicollinearity I was not able to include both of them in

the same model). For instance, when I have estimated the polygyny effect on CEB controlling for the age difference between spouses, instead of age of the husband, as well as including the same control variables in Model 7, the polygyny variable has the expected relationship, namely a positive significant relationship with women's cumulative fertility. These results show that polygynous wives have 16 per cent more children ever born to them than monogamous wives, controlling for the age differences between spouses, number of wives in the union, and the other control variables.

As for my other two hypotheses, namely, my prediction of the negative effect on CEB of husband's age and the negative effect on CEB of the number of wives in the union, the later predication is confirmed. Thus, the results indicate that as the number of wives increases in the union, the production of CEB decreases by 19 per cent, controlling for the other variables.

However, my prediction of the negative effect of husband's age on woman's cumulative fertility is not confirmed. My results seem to indicate that as the age of the husband increases, the production of CEB increases by 3 per cent, holding the other variables constant. This

unexpected finding seems to run counter to the idea that as husbands become older, their wives' cumulative fertility decreases.

As for the other variables in the last model, the results show that woman's age at first marriage, residing in urban area, and age at menarche all have a significant effect on predicting woman's cumulative fertility. Thus, both age at first marriage and urban residence show a negative effect on fertility. The results show that as the age of marriage increases, woman's cumulative fertility decreases by 6 per cent, controlling for the other variables. Also, residing in urban areas reduces woman's cumulative fertility by 8 per cent, controlling for the other variables. In contrast, the results show that age at menarche has a significant positive effect on woman's cumulative fertility. Thus, as age at menarche increases, woman's cumulative fertility increases by 2 per cent.

However, similar to my previous analyses of current fertility, wives' acceptance to marry their husbands has no statistical effect on their cumulative fertility, controlling for the other variables.

In the next chapter, I will discuss in more detail my findings and implications for this dissertation, and then will make suggestions for future research.

CHAPTER VIII

DISCUSSION AND CONCLUSION

In this final chapter of my dissertation, I review and discuss the findings presented in earlier chapters. Next, I discuss the general implications of this research dealing with polygyny and fertility. Then I focus on UAE population policy and the attempts to increase the fertility of UAE nationals. Finally, I put forth some suggestions for future research about the effects of polygyny on fertility.

FINDINGS

Using data from a nationally representative sample survey conducted in the United Arab Emirates in 1998-1999, this dissertation has examined the effect of polygyny on married Emarati women's fertility. Two different measures of fertility have been employed: the first is a current fertility measure, that is, the occurrence of a baby in the past 12 months; and the second is a cumulative fertility measure, that is, the children ever born in the woman's lifetime. Both measures apply to married Emarati women.

There are many reasons for using two measures of fertility in this dissertation. First, I attempted to see if using different measures of fertility results in

different findings. Second, I endeavored to examine the impact of polygyny on both women's current and cumulative fertility. Third, I wanted to be able to gauge the effects of woman's present social and demographic characteristics, such as her education, employment status, her husband's education, contraceptive use, and co-residence status on her fertility. Thus as mentioned before, much of the information in the survey is reflecting women's present characteristics. But the survey does not always measure the woman's characteristics at the time of her conception(s). So in order to be able to use this important information about UAE women and about UAE nationals' family life, different kinds of measures needed to be used. For instance, when I predict current fertility, I can use as independent variables social and demographic characteristics at the time of survey, such as women's education, employment status, contraceptive use, co-residence status, and their husband's education. But when I predict the cumulative fertility measure, I can only use women's characteristics at the time of conception or their characteristics that do not change over time, such as their residence status during the first 12 years of their lives,

whether they have agreed to marry their husbands, their age at menarche, their age at first marriage, and so forth.

The research reported in this dissertation was also restricted to analyses of the polygyny effect on fertility among currently married women who were married only once. This restriction is needed because many researchers have shown that one of the confounding factors that may interrupt the effect of polygyny on fertility is the marital instability of women. Thus, the number of marriages a woman has had may well affect her number of live births (Varea, et al. 1996; Mulder 1989).

In my dissertation I have shown that after controlling for relevant biological and social factors, polygyny, that is, being in a polygynous union versus being in a monogamous union, has positively and significantly influenced wife's current fertility, namely, her likelihood of having a baby in the past 12 months. However, when I introduce a control for the number of wives in the union, the effect of polygyny on wife's current fertility looses its significance.

In contrast, I also show that polygyny has a negative and significant effect on the wife's cumulative fertility, i.e., the number of children ever born to her. However, as

in the case with current fertility, it is only when controlling for the number of wives in the union that the negative significant influence of polygyny on wife's cumulative fertility becomes altered. Thus, after controlling for the number of wives in the union, being in a polygynous union versus being in a monogamous union has a positive effect on the number of children ever born to Emarati women, but, as was the case with wife's current fertility, this effect is not statistically significant.

As previously mentioned in CHAPTER II, there is no consensus on the effect of polygyny on female fertility. However, most studies, especially those conducted in African countries and in Mormon communities in the United States, seem to agree that polygyny is usually negatively associated with female fertility (Musham 1956; Ivins 1956; Dorjahn 1958;Van de Walle 1965; Henin 1969; Page 1975; Ukaegbu 1977; Brown 1981; Farooq 1985; Bhatia 1985; Shaikh et al. 1987;Garenne and Van de Walle 1989; Hern 1992; Josephson 2002; Lardoux and Van de Walle 2003). My findings on Emarati women's cumulative fertility (i.e. their CEB) are thus consistent with these findings of prior research, that is, polygyny has negative effect on women's fertility; but when I controlled for the number of wives in the union,

my research shows that polygyny is no longer negatively affecting Emarati women's cumulative fertility. More precisely, it shows that polygyny has a positive but insignificant effect on women's fertility. This last conclusion also emerged when I examined the polygyny effect on Emarati women's current fertility (i.e. their likelihood of having a baby in the past 12 months). Thus, controlling for the number of wives in the union, polygyny no longer has the expected significant and positive effect on women's likelihood of having a recent birth. This finding for current fertility is, in fact, consistent with prior research that showed a positive effect of polygyny on women's fertility, as Sueyoshi and Ohtsuka's (2003) study in Jordon, Sembajwe's (1979) study of the Yoruba (Western Nigeria), and Arowolo's(1981) study in Ibadan, (Nigeria). However, my research shows that this positive effect disappears when controlling for the number of wives in the union.

The research in my dissertation has also showed that even though the polygyny variable is not statistically significant after controlling for the number of wives in the union, its influence on women's current fertility is still greater than some of the biological and social

factors such as husband's education, age at menarche, residing in urban area, agreed to marry the husband, using contraceptives in the past, and co-residing with another wife (or wives). In contrast, for cumulative fertility, the polygyny variable has the least influential effect on women's fertility; after age of the husband, age at first marriage, number of wife (or wives) in the union, residing in urban areas, age at menarche, and agreed to marry the husband.

It would appear from my statistical analysis that polygyny influences the fertility of Emarati women through a key mechanism. This mechanism is the number of wives in the union. Thus, the key reason for the demonstrated positive association between polygyny and women's likelihood of having a baby in the past 12 months; and the key reason for the negative association between polygyny and women's CEB is the number of wives in the union. In other words, the results indicate that the effect of polygyny on women's current and cumulative fertility is mostly accounted for by the effect of the number of wives in the union.

I will discuss next some of the possible explanations for these results about the polygyny effect on women's

current and cumulative fertility, namely why polygyny has a positive effect on women's current fertility but a negative effect on their cumulative fertility.

One of the reasons for these conflicting results may have to do with the way I have defined marital status. For instance, I have defined women's marital status as a binary variable, that is, a woman can only be a monogamous or a polygynous wife. The problem with this definition is that it fails, to some extent, to capture the differences in fertility between the wife's rank in polygynous union and their monogamous counterparts; and between polygynous wives themselves, namely between lower and higher order wives. Instead, a better definition of marital status would consider the wife order in polygynous unions in order to avoid the aggregation of fertility of all polygynously married women (Mulder 1989). Furthermore, a better approach for capturing the fertility differences, especially when measuring women's current fertility (i.e., her likelihood of having a baby in the past 12 months), would be to compare the fertility of monogamous wives and polygynous wives not only by the wife order, but also by the mean number of co-wives of reproductive age married to a woman's husband during her own reproductive career (Mulder 1989).

Such an approach would be more sensitive to the reproductive competition between monogamous and polygynous wives, and between polygynous wives themselves. Unlike cumulative fertility, current fertility is very sensitive to the women's current reproduction status. For example, if women have ceased reproduction more than one year ago, or if they are infertile, which is not an uncommon situation among first wives, they will not be in a direct competition with the other wives in any marital union (i.e., with monogamous wives or with their co-wives in polygynous unions). In fact, one of the limitations of the data from the UAE survey I used in this study is that polygynous wives are not identified by their rank in the marital union.

Another reason for the demonstrated positive effect of polygyny on current fertility and the negative effect on cumulative fertility, which are accounted for by the effect of the number of wives in the union, might be a result of a high incidence of higher-order wives in my study population. For instance, as I just mentioned, I have examined the aggregated fertility differences between women in polygynous and monogamous unions instead of examining the differences between monogamous fertility and polygynous

fertility by wife order and by their reproduction status (i.e., being fertile, infertile, or sub-fertile wives). If I have a high incidence of higher-order wives in my study population, then the higher-order wives will by definition have had marriages of shorter duration, compared to lower-order wives. This would have likely lowered the fertility of all polygynous wives. Thus, many studies have showed that, over all, higher-order wives will have lower cumulative fertility than the lower-order wives (Smith and Kunz 1976; Sween and Clignet 1978; Arowolo 1981; Anderton and Emight 1989). However, Muhsam (1956) found that second wives had higher fertility than first wives, though not consistently at all ages, as a result of favoritism by their husbands. Lardoux and Van de Walle (2003) have also shown that after controlling for age and number of wives in the union, wives of higher rank tend to have higher fertility than wives of lower rank. So it might be that a large number of polygynous wives in my study population are higher-order wives, which consequently has affected polygynous wives' current fertility positively and the polygynous wives' cumulative fertility negatively.

Studies have also found that a larger difference in age at marriage between the husbands and higher-order wives

may also force the higher-order wives into unions with older, and probably less fecund, husbands (Ukaegbu 1981). Therefore, if my study population has a high incidence of higher-order wives, the age differences between them and their husbands might be another explanation for my findings. Thus, the higher-order wives are more likely to give a recent birth (Lardoux and Van de Walle 2003), but less likely to have more children ever born to them than monogamous wives or their lower-order co-wives (Smith and Kunz 1976; Sween and Clignet 1978; Arowolo 1981; Anderton and Emight 1989).

A third reasons for the conflicting findings of the polygyny effect on women's current and cumulative fertility is the difficulty in this study to control for some of the confounding influences of the variety of mechanisms through which polygyny affects fertility, i.e., some of the factors that often accompany polygyny. For instance, several studies have showed that certain factors may select certain types of women in polygynous unions (Bean and Mineau 1986; Mulder 1992; Sueyoshi and Ohtshka 2003). To illustrate, husbands who recognize that their wives are infecund or sub-fecund, especially at the early ages of marriage, tend to have an additional wife (or wives), and the first wives

will become senior polygynous wives (Sueyoshi and Ohtsuka 2003). Thus, if my study population has a high incidence of infertile or sub-fertile women, these women are more likely to be found in polygynous unions than in monogamous ones, which will lower the average cumulative fertility for all polygynous wives (Van de Walle 1965). Moreover, if the husband is sub-fecund, the fertility of any additional wives will be lower as well (Anderton and Emight 1989).

Even when I have controlled for the effects of marital status (by restricting my analysis to only currently married women who are once married), the expected relationship between polygyny and fertility did not emerge. It was only when I controlled for the number of wives in the union that I was able to find the expected relationship between polygyny and cumulative fertility. It is also probably that, as Anderton and Emight (1989) have suggested, using aggregated fertility difference between women in monogamous and polygynous marriages makes it difficult to explain the relationship between polygyny and fertility because of additional confounding factors. So in order to conclude that fertility differences are a result of women's marital status, one needs to eliminate these confounding factors that might intermediate the

relationship between polygyny and fertility. One way to do that, as suggested by Anderton and Emight (1989), would be to limit attention to polygynous marital fertility because by doing so it is possible for the researcher to analyze, or to control for, the nature of polygynous unions occurring in the given population, such as the ages of the husband and wife at marriage, as well as infertility; and in turn it is possible to identify more precisely the effects of polygyny on fertility behavior in the marital unions.

Nevertheless, my expected positive relationship between polygyny and fertility in the UAE is found when I analyze women's current fertility, but is not found when I study women's cumulative fertility. Number of wives in the union is the mechanism through which polygyny affects Emarati women's fertility. Thus, the main reason for the higher current fertility of wives in polygynous unions, compared to wives in monogamous unions, is the number of wives in the union. The higher the number of wives in the union, the higher the likelihood of women giving a baby in the past 12 months. This probably is due to the presence of higher order-wives in the union. In general, higher order-wives are more likely to have a recent baby than the lower

order-wives, because they are not only more likely to be in sexual competition with the lower-order co-wives, but also with their monogamous counterparts whose fertility, in fact, should be compared with the first wives, not with the higher-order wives. Because, in general, younger wives who are higher-order wives in the union are sexually preferred, and they thus tend to have higher fertility than lower-order wives (Lardoux and Van de Walle 2003).

Not only is the number of wives in the union a key reason for the demonstrated polygyny-fertility relationship, but also the age of the husband is another mechanism through which polygyny affects Emarati women's fertility. As I have showed in CHAPTER VII, the decline of Emarati women's cumulative fertility with increasing number of wives is mostly accounted for by the effect of husband's age. This was confirmed when I controlled for the age difference between spouses and number of wives in a separate model. That is, when I controlled for age difference between spouses and number of wives in the union as well as for the other social and biological variables, the results showed that polygynous wives have 16 per cent more children born to them than monogamous wives.

Even though my main focus in this dissertation was with examining the relationship between polygyny on women's fertility, it is of interest as well to look at the effects of other variables on Emarati women's fertility. I will consider the effects of age of husband, wife's co-residence with another wife (or wives), number of wives in her marriage union, her age at first marriage, her employment status, whether she resides in an urban area, and whether she has agreed to marry her husband, on her current and cumulative fertility. In doing so, I will also be able to examine my other hypotheses, namely the negative effect of husband's age, the positive effect of co-residence with another wife (or wives), and the negative effect of number of wives in the union on women's fertility.

The findings of this dissertation have showed that for both current and cumulative fertility, age of the husband has the most influential effect. For current fertility, it is followed by number of wives in the union, age at first marriage, and working outside the home, while for cumulative fertility, it is followed by age at first marriage, number of wives in union, and residing in urban areas.

In addition, my findings show that while current fertility of a wife decreases as the husband ages, which is consistent with Garenne and Van de Walle's (1989) research, the cumulative fertility of a wife increases as husband ages. In other words, my hypothesis of the negative effect of husbands' age on wife's fertility is confirmed for current fertility, but not so for cumulative fertility. Thus, when the husbands' age increases by one year, the probability of wives producing a child in the past year decreases by 6 per cent, controlling for the other variables. In contrast, as the age of husbands increases, the production of children ever born to wives increases by 3 per cent, holding the other variables constant. One explanation for this difference in the effect of age of husband on current and cumulative fertility might be that in cumulative fertility, unsurprisingly, as a husband lives longer, his wife will be more so exposed to coital frequency, and therefore the more children she will have in her lifetime.

My findings also indicate that my third hypothesis, namely that co-residing with another wife (or wives) should have a positive effect on woman's current fertility, is not confirmed. For instance, my findings show that co-residing

with another wife (or wives) has the same expected direction (positive), but this effect is not significant on predicting the probability of a wife having a recent birth, controlling for the other variables.

My last hypothesis is that as the number of wives in the union increases, the wife's fertility will decrease. This hypothesis was confirmed with regard to cumulative fertility, but not with respect to current fertility. For instance, for cumulative fertility, my findings show that as the number of wives increases in the union, the children ever born decreases by 19 per cent, controlling for the other variables. This finding is consistent with Lardoux and Van de Wall's (2003) findings that fertility in Senegal tends to decrease with the increase in the number of wives in the union. In contrast, for current fertility, when the number of wives of a polygynist increases by one wife, the probability of the occurrence of a birth increases by 54 per cent, controlling for the other variables. This finding appears to support my previous discussion on the possible influence of higher-order wives on current fertility of all polygynous wives. Moreover, another explanation for this positive association is likely that current fertility was able to capture the competition factor between wives to

produce more children as each one of them will try to have more children to show the mutual love between her and her husband to the other wives. Co-wives also will try to alternate births between them in order to produce more children to satisfy their husband's demand for more children, which is one of the main reasons men marry multiple wives, i.e., to have more children. Furthermore, sometimes, wives will not only try to alternate births between them, but will also try to give birth when the other wives do. For example, Lardoux and Van de Walle (2003) showed that the odds of one wife giving a birth were higher when another wife had a birth at the same time. To illustrate, in unions with two wives, when the second wife has a child, the probability of a birth to the first wife is substantially increased, even without any control for age of the husband. In addition, as previously discussed, unlike other populations practicing polygyny, among Emarati married men, the majority of polygynists are married to two wives, and not to more. Indeed, 82 per cent of Emarati men who are polygynists are married to two wives, 12 per cent to three wives, and 6 per cent to four wives. This may well explain why that the majority of polygynists can divide their time relatively evenly between their wives and,

presumably increase sexual competition and increase the risk of pregnancy for each wife; most of them have only two wives. Furthermore, even if the wives do not live in the same residence, which according to the coital frequency model should decrease the fertility of each woman, the spatial distance between the homes of each wife is usually not an issue in the UAE with modern infrastructure and transportation, and with the fact that wives are usually living within close proximity to one another even if they have separate residences.

In fact, while the positive effect of number of wives in the union on current fertility has strong support for the demand for the progeny model, the negative effect of number of wives in the union on cumulative fertility has strong support for the favoritism model.

My results also show that wife's age at marriage has a significant effect on both current and cumulative fertility. However, this effect works in opposite directions. For instance, as woman's age at first marriage increases, her current fertility is shown to increase by 3 per cent, controlling for the other variables. In contrast, as woman's age at first marriage increases, her cumulative fertility decreases by 6 per cent, controlling for the

other variable. One explanation for the positive effect of age at first marriage on woman's current fertility is that the current fertility measure (i.e., the likelihood of a woman giving a baby in the past 12 months) was able to capture the effect of woman's postponing first marriage on her attempts to make up for the time she spent unmarried. For instance, a woman who married later can shorten her birth spacing periods and catch up in childbearing with, or even surpass, her counterpart who married at a younger age. In other words, the older a woman is when she gets married, the more likely she will try to accelerate childbearing to compensate for the initial delay (Anderton and Emight 1989). Thus the more likely it is that she will have had a recent birth (in the last 12 months).

In contrast, the explanation for the negative effect of age at the first marriage on cumulative fertility is that the cumulative fertility measure (i.e., children ever born to a woman) captures the effect of the timing of marriage on a woman's lifetime fertility. Thus, if a woman marries at younger age, she will have more children born to her than a woman who marries at an older age.

Age at first marriage is not the only independent variable that has an opposite influence when predicting

current and cumulative fertility. Whether the woman resides in an urban area also has such an opposite influence. To illustrate, residing in an urban area was shown to have a statistical negative impact on woman's cumulative fertility, but no significant influence on her current fertility, controlling for the other variables.

Working outside the house has a significant influence on woman's current fertility. It decreases woman's current fertility by 26 per cent, controlling for the other variables. In contrast, Emarati women's education, her husband's education, and whether she has ever used contraceptives, do not have any significant effects on her current fertility.

Moreover, whether or not a wife agreed to marry her husband has no significant impact on her current or her cumulative fertility. One reason is the lack of variation in this independent variable. For instance, almost 98 per cent of Emarati women have agreed to marry their husbands. Another reason is perhaps the strong influence of the pronatalist culture on woman's decision for having children. As a Muslim and socially traditional society, the UAE culture encourages spouses to have many children, mainly because producing more children will ensure the

spouses the means of achieving their societal and family goals, such as preservation of the family and lineage, providing labor and emotional support, and providing old-age security for themselves. In fact, demographic processes, such as fertility, are less the direct product of an explicit concern about numbers of desired children, and more so the result of individual strategies and decisions reflecting the structure of power in the society (Obermeyer 1992). It is no doubt then that many Emarati women define marriage as a legal and social institution for producing children. Without children the marriage institution is considered to be an incomplete state (Alnuaimi 2001). Thus, having many children is considered a symbol of importance and success in life. Also, the social status of women still tends to be based on marriage and raring children, especially boys. Moreover, since socio-economic security and family stability both depend on the number of children in the family, it seems that spouses will continue to view marriage as the means for achieving these societal goals, irrespective of whether they have agreed to marry each other or not.

IMPLICATIONS

In this section, I will discuss some of the implications of my research on polygyny and fertility for the literature. Then I will discuss, to a greater extent, the implications of my research for the UAE.

Implications of My Study for the Literature of Polygyny and Fertility

According to Bongaarts and Bulatao (2000), fertility has historically been the key component of population change and the most difficult to predict. There are many social factors that influence human fertility. Some of these factors are shared by all members of the population, such as marriage, education, contraceptives use, female labor force participation, and residence. Some factors are heavily found in certain populations, such as postpartum infecundability and abstinence, as in Africa; and some factors are only restricted to certain populations, such as polygyny.

Therefore, it is important for demographers to consider these differences between populations when studying the mechanisms through which certain factors (or determinants) influence one of the main demographic processes they study, that is, fertility. For instance,

many studies have shown that polygyny, as a type of marriage highly practiced in many African societies, is influencing female fertility in many populations in these societies. Some of these studies have shown that the effect of polygyny on female fertility is negative (Musham 1956; Ivins 1956; Dorjahn 1958;Van de Walle 1965; Henin 1969; Page 1975; Ukaegbu 1977; Brown 1981; Farooq 1985; Bhatia 1985; Shaikh et al. 1987;Garenne and Van de Walle 1989; Hern 1992; Josephson 2002; Lardoux and Van de Walle 2003), others that it is positive (Sembajwe 1979; Arowolo 1981; Sueyoshi and Ohtsuka 2003); and still others that there is no relationship, or if any, it has only marginal influence (Ohadike 1968; Pool 1968; Olusanya 1971; Seetharam and Duza 1976; Chojnacka 1980; Logue 1984; Ahmed 1986; Sichona 1993). In any case, demographers can no longer ignore the effect of polygyny on female fertility when studying women's reproductive behavior in societies where monogamy is not universal.

The effect of polygyny on female fertility is indeed a complex relationship. It needs to be examined in different social settings and using different methods in order to be able to identify the mechanisms though which polygyny influences fertility.

In this dissertation, I was able to examine the polygyny effect on fertility in a new social setting, in the United Arab Emirates. I claim that this is new because my analysis is the first study, to my knowledge, of polygyny and fertility in an oil rich Gulf country. Most prior studies have been undertaken in African societies, in some lowland South American societies, in certain Mormon communities, in some non-Arab Muslim societies (e.g., in Bangladesh), and in some Arab non-Gulf Muslim societies (e.g., in Jordan and in Morocco). My study is also new because the social setting is very different than that we are used to read about in the literature. Most of the polygyny-fertility studies reported in the literature were conducted in African countries where very different economic, social, and cultural factors play a role in determining the relationship. In fact, one of the main objectives of my dissertation was to see if examining the polygyny-fertility relationship in a different social setting might result in a different relationship than that found in the African countries, and to explore the mechanisms through which polygyny affects fertility.

I was also able to use different methods to examine the polygyny effect on fertility, and to show that polygyny

influences fertility through certain factors, particularly, number of wives in the union and age of the husband.

This dissertation also points to the importance of using different methods to examine social relationships. For instance, in my dissertation I used different measures of fertility to examine the impact of polygyny, and other variables, on the reproductive behavior of women. I studied the effect of polygyny on the likelihood of the occurrence of a birth in the past 12 months, as well as the children ever born to her. In so doing, my findings were able to capture different aspects of the effects of certain variables on different measures of fertility. For instance, unlike its effect on cumulative fertility, age of marriage variable was able to capture the effect of woman's postponing marriage on her current fertility. I reasoned that when a woman marries late, she tends to accelerate her childbearing to compensate for her initial delay of marriage. When I examined the effect of this same variable on cumulative fertility, I did not show the same association. Also, using different measures of fertility enabled me to suggest the different mechanisms through which the polygyny-fertility relationship occurs.

Implications of My Study for UAE Population Policy

Unlike virtually all countries of the world, except for Qatar, the majority, indeed over 80 per cent, of the population of the United Arab Emirates is comprised of non-citizens of the UAE. Accordingly the government of the UAE has adopted a range of policies aimed at increasing its population size. These policies can be classified into two types. One focuses on natural increase, that is, raising fertility and lowering mortality; and the other focuses on migration.

In this section, I will only discuss the policy attempts of the UAE government to raise its population by increasing the fertility of UAE nationals.

According to the 2003 United Nations World Fertility Report, the UAE was among the governments that perceive the national fertility level in 2001 as too low; therefore, the UAE's aim was to raise its fertility level so as to increase population growth (United Nation 2003). However, recent publications from the United Nations regarding world population policies in 2005 indicate that the UAE, as a previously pronatalist government, gradually changed its stance in recent years and accepted family planning and

contraception as an integral part of maternal and child health programs (United nation 2005).

Indeed, unlike other countries, the UAE government has never imposed any direct means for increasing fertility. Instead, the government has established several indirect means aimed in the first place at easing the living expenses for its people and providing better health care for children and their mothers; such may well have a positive influence on the fertility of UAE nationals. I will point here to four indirect means, which probably have influenced fertility, but were originally set forth by the UAE government to help UAE nationals cope with living expenses and enhance their maternal and child health care.

The first involves providing incentives to national families when one of the parents is working in the governmental sector. These incentives are given as a monthly allowance and added to one parent's salary for every one child in the family (around $163/month per child).

The second is that UAE national families with a large number of children are given priority by government for housing and housing loans.

The third is the establishment of the Marriage Fund Organization. Because getting married in the UAE can be very expensive, the Marriage Fund Organization was established in 1992 in order to encourage single UAE national men and women to marry, to help them overcome the financial obstacles preventing them from marrying, to try to reduce the number of their marriages to non-national women, and to strengthen traditional family bonds. A typical wedding between nationals in the UAE can cost hundreds of thousands of dollars for receptions, wardrobe, jewellery, dowry, and gifts. As a result, many young national men take on significant amounts of debt through commercial banks to meet the wedding expenses. This often leads to stress and strain in the marriage. Even more worrisome for the government than wedding expenses is the fact that many national men were marrying non-national women, frequently because of the lower costs. This is thought to lead to cultural and social problems in the marriages, and between the newly married UAE nationals and the larger society. Since 1992, the Marriage Fund has provided financial assistance for over 44,000 weddings; as a consequence the percentage of marriages of UAE nationals to non-national women has declined.

The Marriage Fund does not have as direct goals the raising of the fertility of UAE nationals. But it does provide assistance and encouragement for national men and women to marry at relatively earlier ages, rather than waiting until the men are financially better able to provide their wedding expenses. This could well delay marriages to older ages. The Fund thus helps couples to marry and start having family and children at earlier ages.

The fourth is the establishment of labour laws that ease the difficulties involved in rearing children and working outside the home. To illustrate, under the Labour Law Article 30, a "female worker shall be entitled to maternity leave with full pay for a period of forty five days, including both pre and post natal periods, provided that she has completed not less than one year of continuous service with her employer. A female worker who has not completed the aforesaid period of service shall be entitled to maternity leave with half pay" (Ministry of Labour and Social Affairs 1980: 12). Also, Labour Law Article 31 states that "During the 18 months following her delivery, a female worker nursing her child shall, in addition to any prescribed rest period, be entitled to two additional breaks each day for this purpose, neither of which shall

exceed half an hour. These two additional breaks shall be considered as part of the working hours and shall not entail any reduction of wage" (Ministry of Labour and Social Affairs, 1980: 12).

In addition, recent legislation in the UAE government guarantees the maternity leaves of Emarati working women, a new change in both Article 30 and 31. Thus, the relevant new civil service law approved on November, 4, 2001 states that "Emirati women will be given, for purposes of child care, two months fully paid maternity leave, two more months on half-pay leave, and then another two months leave without pay" (El-Haddad 2006: 287).

The question I raised in the Introduction chapter of this dissertation was whether polygyny might become another component in a UAE population policy to increase the fertility of UAE nationals. The UAE nationals comprised no more than 20 percent of the total UAE population in 2005, and according to *Albayan*, a local governmental newspaper, the percentage fell to 13.5 per cent in 2007 (Abdelhamed 2008). So, would increasing the prevalence of polygyny among the nationals produce more children? Should polygyny be one of the elements of UAE population policy to help deal with the demographic problem facing the UAE today?

Actually, my dissertation results show that polygynous wives' current and cumulative fertility is not significantly different from that of monogamous wives, controlling for the number of wives in the union and age of the husband. However, one might argue that if the number of wives influences women's fertility through the effect of husband's age, polygyny might indeed be able to positively influence women's fertility by encouraging men to marry multiple wives at younger ages. To illustrate, with financial support from the UAE government, Emarati men would no longer have a serious financial burden if marrying more than one wife at early ages. Therefore, a population policy should consider polygyny as an important mechanism for endeavoring to increase the UAE nationals' population. In other words, one might argue that practicing polygyny at younger ages may help UAE to increase the fertility and, thus, the population growth of its nationals.

This particular issue is beyond the direct scope of this dissertation, but my findings do show some relevance for using polygyny as a mean for increasing UAE nationals' fertility. In this dissertation, I have demonstrated that polygyny is not the most important factor influencing Emarati women's fertility. In fact, age of the husband and

woman's age at marriage are among the most important factors that influence Emarati women's fertility, regardless of the type of union they enter. For instance, the findings of my dissertation have showed that with regard to current fertility, as age of husband increases, wife's fertility deceases by 6 per cent, controlling for other variables. With regard to cumulative fertility, one year increase in woman's marriage age lower her fertility by 6 per cent, controlling for other variables.

Another important factor that influences current fertility is female labor force participation. The findings of this dissertation have demonstrated that the fertility of employed Emarati women is 26 per cent less than that of unemployed Emarati women, controlling for other variables

Moreover, the argument that polygyny could well influence the population growth rate by producing more children, might not be particularly well-grounded because as Chojnacka (1980), argues "the major demographic consequence of polygyny is reflected in the very young nuptiality pattern for women which directly affects the rate of population growth" (Chojnacka 1980: 106). In other words, what affects population growth might not be the polygyny prevalence by itself, but the fact that women in

polygynous marriages marry at young ages and therefore produce more children.

Therefore, a more prudent UAE population policy aiming at increasing fertility in order to increase the population numbers of nationals would focus on encouraging both women and men to marry at younger ages, and on easing the incompatibility between women's work, as well as her desire to pursue her education, and her intended number of children. These institutional responses are seen by many demographers as ways to increase fertility in low fertility populations, such as those in Europe and, to a lower extent, in the United States (Morgan 2003).

If the UAE government plans to adopt a national population policy through increasing fertility, it needs to focus on direct means, not only on the indirect means that may or may not have been effective in increasing its nationals' population size. In fact, until now there is no clear fertility policy in UAE or in any of the other Gulf countries. As previously mentioned, the monthly allowance, maternity leave, marriage funds, and other means do not aim in the first place at increasing the population of the UAE nationals. Instead, they aim at easing the living expenses and at providing better heath care for children and their

mothers. And with increasing levels of female education and labor force participation, it will be very hard to increase fertility of the nationals. In fact, many Emarati women postpone marriage, and therefore having children, until they finish their education, a time when marriage chances are diminished. Also, even when women marry by the time they finish their education, the postponement of marriage, and therefore births, bring the risk that women will not have all the children they intended to have. One reason is the high level of infecundity at older ages (Morgan 2003). Another reason is that the competing demand may interact with being "too old" in a social sense, for rearing children (Morgan 2003).

In fact, even though it has not been clearly shown in this dissertation, a review of the trends in developing countries has shown that there is a strong correlation between advanced female education (10 or more years) and low fertility (Fargues 1989; Jejeebhoy 1995). Women's education is considered to be one of the transformations experienced by the UAE family that has clearly influenced their marriage ages. Also, educating and preparing girls for a world outside their family circle have given them occupational ambitions other than the traditional role of

homemaker and mother (Faruges 1989). Caldwell (1982) has argued that mass schooling probably has had a greater impact on the family in developing counties than it ever had in Western countries. This is so mainly because it occurred in many countries at earlier stages of economic and occupational development than it did in the West, and because by definition the process involved Westernization and the Western concepts of gender and family. Also the media has played a substantial role in breaking down some of the cultural barriers and in the diffusion of universal fertility norms (Caldwell 1982). In fact, the media's role in reflecting Western attitudes and value systems of family limitation and small family size has become among the most important factors in the contemporary decline in fertility in a number of developing countries (Knodel and Van de Walle 1979; Caldwell 1982). This is very true when we observe how the attitudes toward values and family size among UAE youths have changed after modernization, especially, in recent years. For example, many new UAE parents believe that the quality of children is more important for them than their "quantity." Many parents are favoring fewer and "high-equality" children because they believe that each child is unique and deserves substantial

parental investment, including financial support and parental time and attention (Morgan 2003). So, the relatively large family size now is viewed as inconsistent with good parenting, a view shared by many parents in both developed and some developing countries (see also Bulatao 1981). This ideological shift is encouraging UAE parents to focus attention on just a few children, thus creating another challenge for any population policy that the UAE government may decide to establish. Furthermore, women's changing attitudes toward themselves and their husbands make them believe that bearing numerous children might threaten their attractiveness and beauty as well as take them away from their husbands, many of whom share with them similar attitudes.

All these factors add a challenge to any population policy that the UAE government may be thinking to establish, especially when we know that the nationals' fertility rate has fallen from 7.2 in 1985 to 4.6 in 2004 (Morris 2005). The UAE Human Resources Report (2005: 11) has also noted that "the most outstanding development in demographic characteristics of the UAE population is the sharp and constant decline in the gross fertility rate; from 1985 to 2004, it dropped by 57% for the UAE

population." In fact, the fertility rate is expected to fall further in the future, leading to a slower population growth among nationals.

Moreover, arguably it is much more difficult to increase fertility when it is low than to decrease it when it is high (May 2005). As in the case of Singapore, in 1984 authorities tried to correct some of the excessive results of the antinatalist policy. The main goal was to encourage fertility among Chinese couples with the highest education levels. The new policy has not yet produced conclusive results (May 2005), but many have argued that with the secular changes (couple's high educational level, female labor force participation, Western value system, and so forth), it will be very hard to raise the fertility levels to government aspired levels.

Furthermore, the fertility literature clearly shows that "once the fertility transition begins, it does not stop until fertility reaches levels of approximately two children or lower; once a 10% decline in fertility occurs (for any province), an irreversible transition was underway" (Mogran and Hagewen 2005: 241). Applying this to the UAE, the fertility of UAE nationals has dropped from 7.2 in 1985 to 4.6 in 2004. This means that the UAE

nationals' fertility has experienced around a 39 per cent decline.

As we have seen in this dissertation, the UAE is not the only country in the Gulf experiencing a fertility decline. The other Gulf countries are also experiencing fertility declines in varying degrees.

FUTURE RESEARCH

There are numerous ways to extend this research. One is to examine the interaction effect among the independent variables. The results reported in this dissertation pertain to direct, or main, effects of polygyny and the other covariates on women's fertility behavior. It may well be the situation that the effect of polygyny on the likelihood of having birth in the last 12 months and the children ever born may vary according to the magnitude of one or more of the other independent variables. Thus, in addition to examining the main effects of polygyny on women's fertility, I might also ask if polygyny has an effect on fertility when it is interacting with other independent variables. It might be, for instance, that the effect of polygyny on women's reproductive behavior is stronger for unemployed women compared to employed women,

or for women who reside in rural areas compared to women who reside in urban areas.

Also many studies have shown that age of husband is the most important factor affecting couple's sexual activity when the influences of women's age and marriage duration are taken into account. Due to multicollinearity I was not able to use women's age and marriage duration along with husband's age in my models. Maybe new models trying to deal with this issue are needed as a way to capture the nature and consequences of age of the husband on women's reproductive behavior.

A second suggestion would be to examine the relationship between polygyny and fertility by wife order. Perhaps the aggregate comparison between fertility of all polygynous wives with monogamous wives may fail to identify variation in fertility among polygynous wives themselves which may account for the polygynous -monogamous differences. As argued by many researchers, a more satisfactory test of examining polygynous-monogamous fertility differences requires a comparison of polygynous wives specified by wife-order with monogamous wives. Or a more sensitive measure of marital status than wife order needs to be used, such as the mean number of women in

reproductive age married to a woman's husband during her own reproductive career (Mulder 1989). Such a marital status measure, Mulder (1989) has argued, can capture the extent, nature, and consequences of competition between co-wives. For instance, this index measures the intensity of reproductive competition between co-wives during their reproductive years, rather than ranking the wives by order of marriage. Thus, one of the problems of wife order is that it fails to measure the costs of sharing the husband. For example, women may be a third wife in the union, but her co-wives may have ceased reproduction more than 20 years ago, or may even have died. Therefore, she will not be in direct comparison with other polygynous wives.

A third suggestion is to examine the effect of polygyny on female fertility controlling for the educational difference between husbands and their wives. The underlying assumption is that if a wife has more education than her husband, she might have more power, which therefore might influence the reproductive decision making in the family.

A fourth suggestion is to examine the causes of polygyny, or confounding factors associated with polygyny, which might be mistakenly viewed as consequences of

polygyny. For example, men married to women with whom they cannot produce children are more likely to take second wives. Childlessness might be higher among the first polygynous wives than among monogamous wives, which may well affect all polygynous women's fertility. So, as argued by Mulder (1989), a number of alternative explanations must be ruled out minimizing the evidence of a selective process whereby women of low reproductive potential (for example, infertile) are more likely to find themselves in polygynous marriages. Unfortunately, the survey data I used in this dissertation are the only such survey data available to me at this time; there are no data in the UAE survey dealing with women's infertility status. Future research using different data needs to take into account the above issues to be better able to rule out the above kinds of explanations.

A fifth suggestion is to expand this research to the other Gulf countries. The Gulf countries have similar social and cultural environments, but to a varying degree different economic conditions. Expanding this research would be beneficial for the continuation of this research because as we have seen the prevalence of polygyny tends to be different in the different Gulf countries, with the

highest percentage in Saudi Arabia (19 per cent) and the lowest percentage in Bahrain and Qatar (8 per cent). Also, examining the polygyny-fertility relationship in different social settings might expand our knowledge about this relationship.

As previously pointed out, the relationship between polygyny and fertility is a complex one. It can not be examined definitively with data from a single survey. To explore the general effects of polygyny on women's reproductive behavior, more research is definitely needed.

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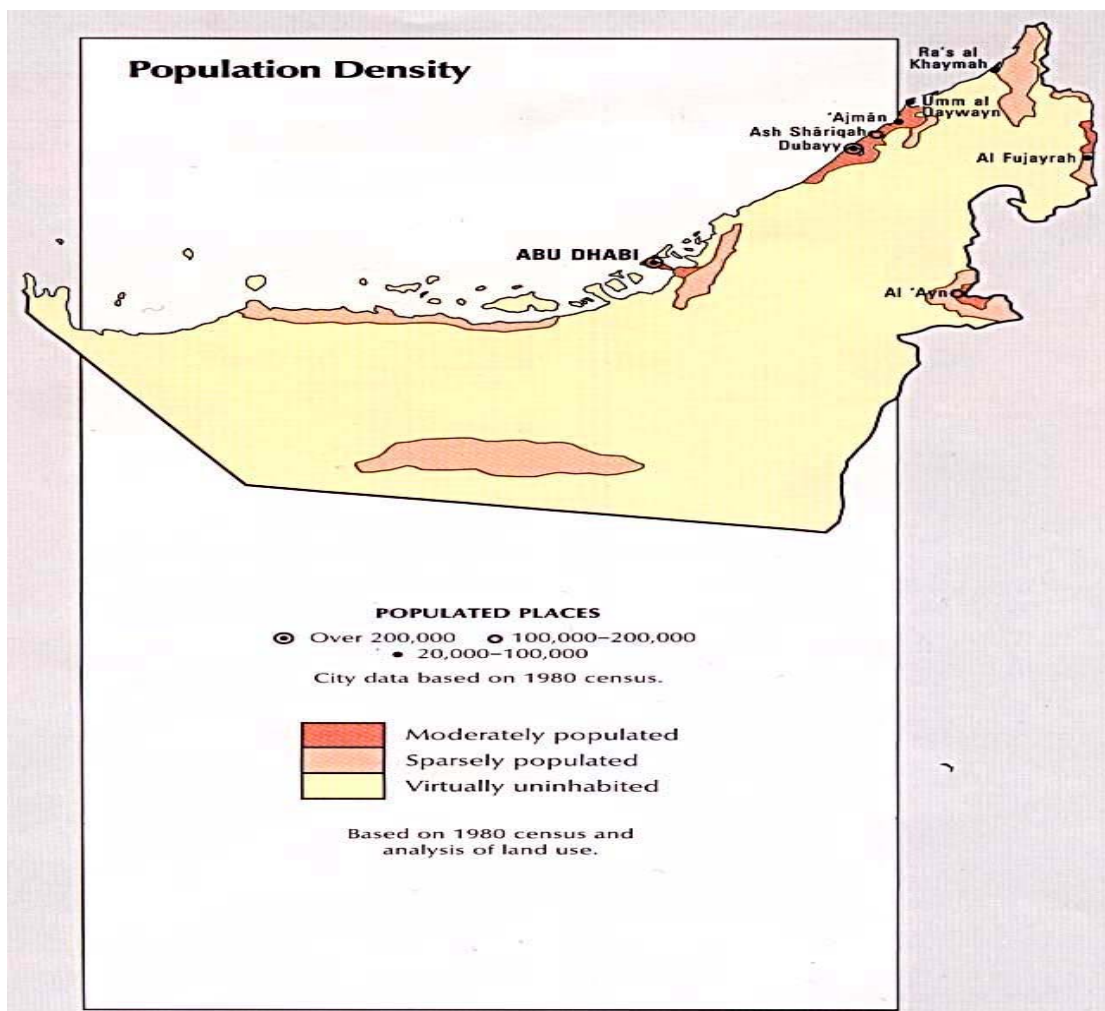
APPENDIX A

MAPS

Figure 23. Map of Asia

Figure 24. Map of the United Arab Emirates

Figure 25. United Arab Emirates Population Density, 1980

APPENDIX B

DISTRIBUTION OF CEB AND UNIVARIATE POSSION
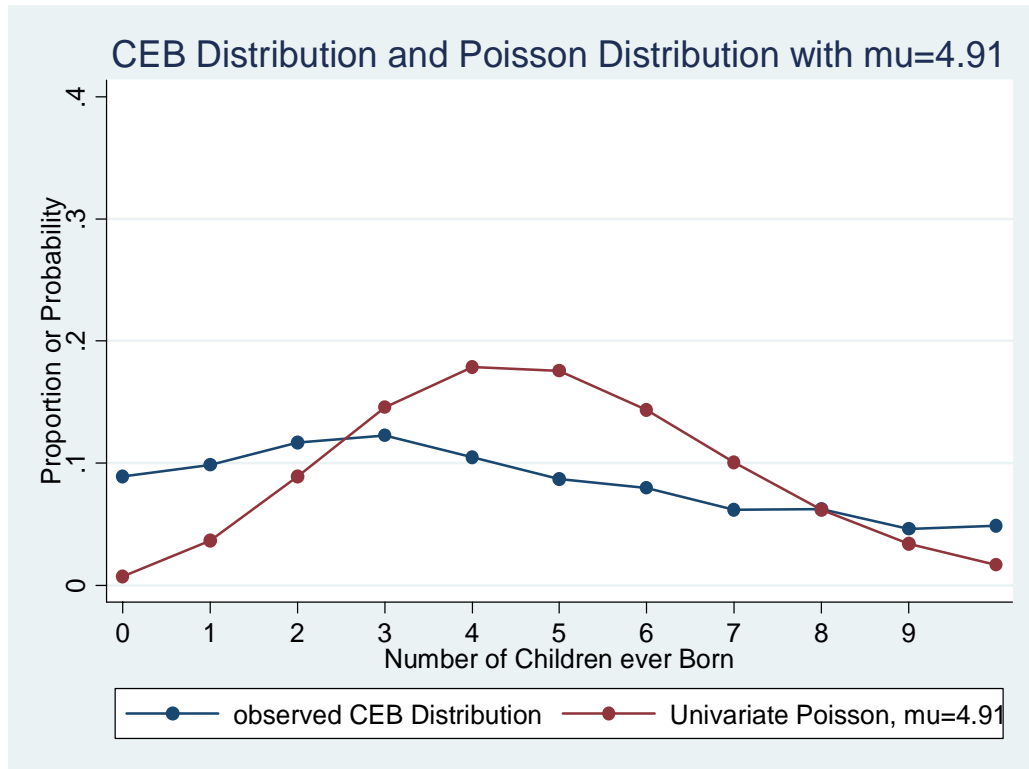

Figure 26. Distribution of CEB and Univariate Poisson
             for Emarati Women, 1999

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