Hammoudeh[a,b], Weeam, Hogan[a], Dennis. Decomposing the Palestinian 'demographic puzzle': An exploration of the proximate determinants of fertility in the West Bank and Gaza

Introduction:

Between 1995 and 2006, the total fertility rates (TFR) in the occupied Palestinian territories (oPt) dropped over thirty percent from a TFR of 6.1 children per woman to 4.6 children per woman. The decline of fertility slowed considerably between 2006 and 2010 with a 2010 TFR of 4.4 children per women. Much of the literature on Palestinian fertility has focused on the exceptionally high fertility rates in the West Bank and Gaza, which have posed a 'demographic puzzle.' The structural factors considered necessary for fertility decline, such as improvements in women's education, significant reductions in infant mortality rates, access to contraception, and increased urbanization are present in the oPt, yet have not resulted in the level of fertility typically associated with these social changes (Fargues 2000; Khawaja et al 2009).

A significant thread of the literature has focused on political explanations for the relatively high levels of Palestinian fertility, where scholars have argued that pronatalist ideologies espoused by Arab leaders have encouraged high fertility levels (Courbage 1999; Fargues 2000; Khawaja 2000). However, most of the evidence for this argument has been based on time trends in fertility, particularly the rise of fertility during the first Palestinian uprising between 1987-1993. Other studies have examined variations in fertility trends across the West Bank and Gaza Strip, including demographic and women's education variables as possible explanatory factors in explaining fertility trends (Khawaja 2000, 2003; Khawaja et al 2009). However, these studies have examined education and marriage separately without including these factors in a model assessing their overall impact on fertility; none of the studies have directly accounted for the

contribution of each of these determinants to fertility change.

This study examines the factors associated with the considerable fertility decline that has been noted since 1995, and the recent stabilization of fertility at roughly four children per woman. More specifically this paper addresses the following research questions: (1) How has fertility changed in the oPt between 1996 and 2010; (2) Have changes in fertility been the same in the West Bank and Gaza Strip? (3) What is the main proximate determinant driving fertility change?; (4) Are there important regional differences in terms of the proximate determinants of fertility?; (5) What are the factors associated with modern contraceptive use in the oPt?, and have these factors changed between 2000 and 2010?

Background:

The occupied Palestinian territory (oPt) is divided into two distinct geographic areas, the West Bank and Gaza Strip. The Gaza Strip covers an area of less than 400km^2 and with a population of around 1.8 million people; it is one of the most densely populated places in the world. The West Bank is less urban than Gaza. On average, the Gaza population is slightly more educated than the West Bank population. However, the Gaza Strip has greater poverty and spiraling unemployment rates as a result of siege and closure (Giacaman et al 2009), and has been sealed off from the West Bank and from the outside world (Sayigh 2007).

A recent World Bank report shows that the Palestinian economy has been in decline since the mid-90s (World Bank 2013). The Palestinian economy is very donor dependent. Much of the workforce in the oPt is employed by the Palestinian Authority, which relies on international funding agencies to meet its annual budgetary needs. The situation in Gaza has been especially

difficult, where Gaza's external borders have often been closed and only open periodically to allow limited movement of people and goods. In the West Bank, restrictions on mobility are also pervasive with over 300 checkpoints within the West Bank and the construction of the separation wall resulting in devastating impacts on mobility, livelihood, human security, and the Palestinian economy as a whole. The situation has also been further aggravated by political strife between the Fatah led Palestinian Authority in the West Bank and the Hamas government in the Gaza Strip.

Despite these hardships, Palestinian health indicators generally point to remarkable progress, especially in comparison to other countries in the region with similar economic and demographic characteristics. Infant mortality rates are among the lowest levels in the region (Abdulrahim et al 2009), with an estimated Infant Mortality Rate (IMR) of 20.0 infant deaths per 1000 births in 2010 (PCBS 2012). Antenatal care is nearly universal, and over 95% of all deliveries are attended by skilled personnel. Child immunization is also almost completely universal (PCBS 2007).

These improvements have been attributed to an effective primary health care system that was initiated through the work of a grassroots movement focused on health beginning in the late 70s and early 80s. Primary health care is currently largely funded by international donors, as well as the health services provided by the United Nations Relief and Works Agency, which was established in 1950 and is responsible for health and education services for registered Palestinian refugees (Giacaman et al 2009).

Literature Review:

Numerous studies have highlighted the importance of environmental, social, and economic factors in explaining variations in fertility trends within and across populations (Blake and Davis 1956; Bongaarts, Frank, and Lesthaeghe 1984; Bongaarts 2008; Bongaarts and Watkins 1996; Cleland 1994; Caldwell and Caldwell 1987). While the importance of these factors in influencing fertility has been established, their impact on fertility is indirect and varied across settings. Contextual factors typically influence fertility by influencing the proximate determinants of fertility. Building on the framework developed by Davis and Blake (1956), Bongaarts formulated a model that first summarized the eleven intermediate variables to eight proximate determinants and then reduced the model to four key proximate determinants: proportion married among women in the reproductive age group; contraceptive use; induced abortion; and postpartum infecundability, which is primarily based on duration of breastfeeding (Bongaarts 1978; Bongaarts and Potter 1983). Furthermore, these four proximate determinants were found to explain about 96% of the variance in fertility across populations (Bongaarts and Potter 1983).

Bongaarts and Potter (1983) identify trends in total fertility and the role of the proximate determinants at various stages of development based on trends at the time of their study. In more developed societies, fertility decline occurs through: a postponement of marriage, which results in the delay of childbearing and the reduction of the duration of time a woman will spend in union during her reproductive years; and increased use of contraception and induced abortion in cases of unwanted pregnancies. In less developed settings, or pre-transitional societies, fertility is high.

The main contributors to overall fertility, however, differ from those in more developed countries. Marriage in less developed countries tends to be more universal and typically occurs at younger ages, hence increasing the amount of time women spend in union during their reproductive years. In these settings, contraceptive use and induced abortion tend to be more infrequent. Fertility is reduced primarily through postpartum infecundability resulting from the high prevalence and relatively long durations of breastfeeding, as well as some cultural norms relating to the acceptable period of postpartum abstinence (Bongaarts and Potter 1983). As populations move along the stages of the fertility transition, the contributions of the proximate determinants are expected to change. Studies from settings around the world show that there are significant variations in the contributions of the proximate determinants of fertility both within and across populations.

Since the development of the model, the Bongaarts framework has been used in a multitude of studies examining fertility trends in various regions of the world (Eltigani 2005; Palamuleni 2008; Sibanda et al 2003; Spoorenberg 2009; Tey, Ng, and Yew 2011). Sibanda et al (2003) use the Bongaarts framework to examine the factors behind fertility decline in Addis Ababa compared to other urban and rural areas in Ethiopia. They find that the single most important proximate determinant in reducing fertility in Addis Ababa, as well as in other areas, is the increase in the proportions of unmarried women. Contraception is the next main contributor to the decline in fertility. The changes in marriage patterns have resulted in reducing fertility to very low levels compared to other parts of Ethiopia and sub-Saharan Africa. In their analysis of the proximate determinants of fertility in Peninsular Malaysia, Tey et al (2011) also find that marriage postponement and contraceptive use are the most important proximate determinants in

terms of their effects on fertility. Another study (Spoorenberg 2009) of sharp Mongolian fertility decline in the post-socialist era found that the main source of fertility decline was the increased reliance of women on modern contraception in the new market economy, which made modern contraception available. Prior to the economic shift, induced abortion was the proximate determinant that accounted for the greatest proportion of fertility limitation.

Sources of Fertility Decline in the Arab World:

Fertility levels in the Arab world have dropped substantially, with an average TFR of about 3 births per woman in most of the Arab world, and with some countries like Lebanon and Tunisia at or below replacement level fertility. The oPt stands as an exception in this regard with an average of slightly over four births per woman, despite socio-demographic characteristics and contraceptive prevalence levels similar to countries with much lower fertility levels. Yemen is the only Arab country with higher total fertility rates than the oPt, and varies quite markedly on key socio-demographic variables like women's education.

Rashad (2000) and Eltigani (2005) examine changes in the proximate determinants of fertility and evaluate some of the underlying factors that have influenced fertility transition in the Arab world (primarily excluding the oPt). Rashad (2002) finds that while fertility decline in parts of the Arab world was delayed compared to other regions, fertility decline has actually occurred at comparable and at times faster rates compared to other parts of the world. Similarly, Eltigani (2005) finds that contrary to what had previously been purported about Arab fertility being peculiar in that it starts early and continues into late reproductive ages, the age pattern of fertility in the Arab world is actually very similar to other regions in that with the decline in fertility,

fertility has shifted from very young ages to adult ages, with more births occurring among women between 24 and 29 years of age and declining among women between 15 and 19 years of age. Findings from both studies indicate that variations in fertility in Arab countries are now primarily determined by age at marriage and the percentage of women currently married. Rashad (2000) points out that it is not just that marriage has been delayed in many Arab countries, but that increasing proportions of men and women in the Arab world are expected to remain unmarried well into later reproductive ages (even 40 and older). The role of contraception in inhibiting fertility in these countries has also become more significant in recent years, and in a few countries (for example, Algeria and Tunisia) is actually the most significant proximate determinant of fertility (decline).

The findings of these studies reveal that in the Arab world, fertility behavior has moved towards more intentional control of fertility rather than a state where fertility is determined incidentally by nuptiality and lactational behavior (Eltigani 2005). Furthermore, declines in fertility have been substantial, with fertility in most countries declining by more than two births per women from the late 1970s to 2000, with considerable variation across countries. Both studies highlight the importance of contextual factors and differences across countries in understanding fertility transition in Arab countries. These factors include differential changes in nuptiality and family formation patterns, as well as socio-economic conditions, which are quite varied across the Arab world.

What these and other studies reveal is that the proximate determinants affect fertility in various ways across settings and at times within settings. Understanding the influence of the proximate

determinants outlined in the Bongaarts framework on fertility can help in understanding the mechanisms by which socioeconomic conditions work to impact fertility. Similarly, this study utilizes the Bongaarts framework to examine the role of the proximate determinants of fertility in accounting for the fertility decline that has occurred in the occupied Palestinian territories since the mid-90s, and its continued high levels.

Methods:

This paper employs a quantitative research design using secondary demographic and health datasets collected by the Palestinian Central Bureau of Statistics. This paper begins with a decomposition analysis of the proximate determinants of fertility decline in the oPt. Following the decomposition, we conduct a more detailed multivariate analysis of modern contraceptive use between 2000 and 2010.

Datasets:

Data from four Demographic Health Survey (DHS)-type household surveys were utilized in this paper. The household surveys were conducted by the Palestinian Central Bureau of Statistics (PCBS), and are all representative at the national level (combining West Bank and Gaza Strip). Data from the 1996 Health Survey, the 2000 Demographic and Health Survey, the 2006 Palestinian Family Health Survey, and the 2010 Multiple Indicator Cluster Survey (MICS) were utilized. The four datasets are used in order to examine fertility and contraceptive use trends over different points in time between 1996 and 2010[1].

[1] Data from the 1996 health survey is from a subsample of the 1995 Demographic survey undertaken by PCBS. The survey was based on a multistage stratified sample design. The survey sample was constructed from population estimates and household listings of select clusters, or cells, in small areas (PCBS 1996). For the 2000 survey,

Sample Description:

Despite the variations in sampling strategies, the samples of all of these respective surveys are nationally representative. Table A1 provides a summary of the data sources and sample design.

For the decomposition analysis, all women of reproductive age are included in the calculations. Initially we conducted an analysis of contraceptive use for all four surveys (not reported). However we were severely constrained by the 1996 demographic and health survey due to the unavailability of key socio-demographic variables we were interested in that include the number of births a woman has had as well as questions on women's involvement in contraceptive decision-making. Because the analysis we could do with the 1996 dataset[2], we decided to focus the multivariate analysis on the 2000, 2006, and 2010 surveys. With these data sets, we were able to include key socio-demographic characteristics as well as indicators for women's autonomy and involvement in contraceptive decision-making. The final sample for this analysis of contraception consisted of currently married non-pregnant, non-menopausal women between the ages of 15 and 49.

Measures:

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stratified random samples were drawn using a sampling frame based on the 1997 population census. The sampling frame for the 2006 survey was based on an updated frame originally based on 1997 census. The 2000,2006, and 2010 surveys use a multistage stratified sample design, but unlike the 1995 and 1996 surveys, they were based on samples drawn from census enumeration areas. The 2006 and 2010 surveys were further stratified by governorate (within the two main regions of West Bank and Gaza Strip) and type of locality; while the 2000 survey was stratified by region and type of locality[1]. All of these surveys include complete birth histories for women and more detailed information for more recent births (the last two births for the 1996 survey and all births in the last five years for 2000, 2006, and 2010 surveys) for ever-married women between the ages of 15-49.

[2] In this analysis, the independent variables that were included were age, age-squared, education (in years), current employment, number of household members, and region. Because the total number of births a woman had was not made available in the 1996 dataset, the number of household members serves as a rough proxy for the number of children in the household or overall household size. While this choice has its obvious limitations, it was the best that could be done with the data available. Age at marriage and type of locality could not be included in this analysis as well.

Stage I-Decomposition:

The measures included in stage I consists of the indices based on the Bongaarts framework with the exception of the index of abortion. Induced abortion is extremely rare in the oPt and there are no reliable population statistics on abortion, rendering it impossible to calculate this index. The indices included are the index of proposition married $C_{m,}$ index of contraception $C_{c,}$ and the index of postpartum infecundability $C_{i.}$ The index of proportion married C_m is calculated based on the weighted average age of the age-specific proportions married, with the weights given by the age-specific marital fertility rates. All index scores range from 0 to 1; a score of 1 indicates that all women within the reproductive age group are married[3]. Births occurring in the year leading up to the survey period are included in the analysis of fertility.

The index of contraception C_c is equal to 1 if no form of contraception is used and zero if all fecund women use modern methods of contraception that are 100 percent effective. The index of postpartum infecundability, C_i, is equal to 1 in the absence of postpartum abstinence and breastfeeding and zero when infecundability is permanent. Bongaarts recommends using 15.3[4] as the maximum number of births or the total natural fertility rate (TN), based on the theoretical maximum level of natural fertility. The equation for the total fertility of a population is[5]:

$$TFR = TN \times C_m \times C_c \times C_a \times C_{i.}$$

Stage II-Multivariate Analysis:

[3] This index assumes that no childbearing happens outside of wedlock.
[4] Since this is an estimate, it is expected to result in some variation between observed and predicted fertility. Furthermore the estimated efficacy of contraceptives may also explain some of the variation between observed and predicted values.
[5] For a more detailed description of the calculation of the indexes, see Bongaarts (1978).

For the multivariate analyses, the main dependent variable of interest is current use of modern contraception. Table A2 in the annex outlines the concepts, measures, and variables included in this stage of the analysis.

Analysis:

The analysis for this paper consists of two stages. The first stage begins with a decomposition analysis of the sources of fertility decline based on the Bongaarts framework. Following the decomposition analysis, additional micro-level analyses of the most important proximate determinant, based on overall contribution to fertility, are conducted. The second part of this paper will focus on the determinants of contraceptive use among Palestinian women in the West Bank and Gaza Strip.

Stage I: Decomposition:

The analysis was conducted using the Bongaarts framework initially at the aggregate oPt level for 1996, 2000, 2006, and 2010and then further disaggregated into West Bank and Gaza Strip for 1996 and 2010. Since mobility between the two regions is highly restricted (Giacaman et al 2009), it is safe to treat them as separate physical entities for the purposes of this analysis. The contribution of each of the proximate determinants is compared across region and across survey year. For the 1996 and 2000 surveys, the raw data did not include information on breastfeeding duration. The prevalence and mean duration of breastfeeding were, however, reported in the final report (PCBS 1997, 2001). For the calculation of postpartum infecundability, reported figures were used for the 1996 and 2000 survey samples. Following the calculation of the indices, the proportion change in fertility accounted for by each of the indices was calculated. The overall

change in fertility would depend on the sum total of the changes in fertility accounted for by each of the proximate determinants.

Stage II: Multivariate Analysis of Modern Contraceptive Use:

The multivariate analysis consisted of separate logistic regression analyses run for each of the survey years (2000, 2006, and 2010) separately[6]. For these surveys, an initial model including socio-demographic characteristics was conducted. This model included, age, age squared, age at marriage, number of births, education, current employment, region of residence, and type of locality (results not shown). A second model including the socio-demographic characteristics as well as additional variables on women's involvement in contraceptive decision-making, and fertility/reproductive desire were included. The final results only present the second model because it offers more insight into possible social mechanisms at play in contraceptive decision making. Furthermore, the coefficients for socio-demographic characteristics in the first model were similar to those in the final model.

Results:

Stage I: Decomposition:

Research Question 1: How has fertility changed in the oPt between 1996 and 2010?

Overall, for the oPt, there has been a 27.6% decline in predicted TFR and a 27.9% decline in observed fertility, with the biggest declines from 2000 to 2006. These overall changes in fertility are based on the sum total of changes in fertility accounted for by the three indices.

Research Question 2: Have changes in fertility been the same in the West Bank and Gaza Strip?

[6] Relative sample weights were included in the analysis. Tests for multicollinearity were conducted for all multivariate analyses, and no issues were found.

The results also indicate some regional variation in the fertility decline. Comparing overall change in TFR in the period between 1996 and 2010, it is evident that the TFR was highest in Gaza in 1996 and 2010, while the predicted TFR decline in the West Bank was 1.3 children per woman compared to a decline of 2.0 children in Gaza. The pace of decline was somewhat faster in Gaza (33.4%) than in the West Bank (27.9%). This is also the case when examining trends in observed fertility, where between 1996 and 2010, there has been a 25.9% decline in observed fertility in the West Bank compared to 29.7% in the Gaza Strip.

Research Question 3: What is the main proximate determinant driving fertility change?

Table 1 provides a decomposition analysis of the factors in fertility change based on the four surveys. For each survey, the fertility rates are based on births born in the year leading up to the survey. As can be seen from the results, the index of contraception (C_c) is the lowest by the 2006 period, indicating the primary role of contraception in fertility reduction between 1995 and 2006. However, while change in contraceptive use between 2006 and 2010 also were the leading factor in fertility decline, the change was small enough that predicted fertility was nearly unchanged during the recent period. There has been more change in this index compared to the other indices overall, as confirmed by the percentage change in total fertility due to this index (table 2) between 1996 and 2010. There has been a slight decline in fertility attributable to changes in the proportions married ($C_{m)}$.

Research Question 4: Are there important regional differences in terms of the proximate determinants of fertility?

A greater percentage of change attributable to contraception took place in Gaza than the West Bank between 1995 and 2010, with about an 18.4% decline in fertility associated with the contraception index in the West Bank compared to 22.2% in the Gaza Strip. The percentage change in fertility attributable to changes in proportions married are greater from 1995 to 2010 in the Gaza Strip (7.4% decline) compared to the West Bank (4.9% decline). The calculations of the index of postpartum infecundability (Ci), which is primarily based on breastfeeding duration, presented in Table 2 indicate a modest change in fertility accounted for by increased breastfeeding duration in the West Bank and Gaza Strip with increases in breastfeeding duration resulting in a 4.6 % decline in fertility in the West Bank compared to a 3.6% decline in the Gaza Strip.

Stage II-Multivariate Analysis of Modern Contraceptive Use:

Research Question 5: What are the factors associated with modern contraceptive use in the oPt? And have these factors changed between 2000 and 2010?

Table 3 provides an overview of the descriptive characteristics of women included in the more detailed analysis of the 2000, 2006, and 2010[7]. Overall, about 40% of the women in the 2000 sample were using modern contraception at the time of the survey compared to about 46% in 2006 and 49% in 2010. Employment among women has increased between 2000 and 2010, with 6.74% of women employed in 2000 compared to 11.81% in 2010. A growing proportion of women are living in urban areas; in 2010, 72.7% of women were living in urban areas compared to 48.69% in 2000.

[7] These analyses exclude women that reported being menopausal or women reporting that they were unable to become pregnant.

Taking into account all of the factors predicting contraceptive use in the extended multivariate models (Table 4), we see that increases in contraceptive use that are associated with additional years of age until age 35 are similar in 2000, 2006, and 2010. Each additional birth increases the odds of contraception by roughly 15%. In these models, each additional year of education increases the odds of contraceptive use by 8% in 2000, 4% in 2006, and 5% in 2010. The statistical significance of these differences was confirmed through significance tests that were conducted post-estimation (not reported). Employment is rare among married women in the Palestinian territories and, unlike most other populations, has no impact on contraceptive use. Also, unlike other populations around the developing world, living in urban rather than rural areas is not associated with higher rates of contraception. However, refugees residing in camps are more likely to use contraceptives than rural and urban residents; the effect of camp residence on increased contraceptive use declines from 38% in 2000 to 17% by 2010. Contraceptive use is higher in the West Bank than in Gaza - 62% higher in 2000 declining to 48% by 2010.

Women involved in the final decision to use contraception were more likely to use modern contraception compared to women that were not involved in contraceptive decision-making. Women involved in contraceptive decision making were about 32% more likely ($p<0.001$) than women not involved in contraceptive decision making to be currently using modern contraception in 2000. Among women in the 2006 and 2010 samples, women involved in contraceptive decision-making were about 1.66 times as likely to use modern contraceptive compared to women that were not involved in contraceptive decision-making ($p<0.001$). Women reported that they did not want additional children were 2.6 times more likely to use contraceptives in 2000 compared to women reporting that they wanted to have more children in

the future. In 2010 women reporting not wanting anymore children were found to be 3.5 times more likely to use contraception compared to women reporting wanting additional children in the future.

Discussion and Conclusions:

While fertility in the West Bank and Gaza Strip continue to be high given the high levels of urbanization and years of schooling in the occupied Palestinian territories, the findings of this study show that significant declines in fertility have occurred between 1995 and 2010, with the biggest declines occurring between 2000 and 2006. Between 2006 and 2010, there appears to be minimal change in predicted total fertility, which may indicate a possible stalling of fertility decline. In fact, the effects of additional years of schooling on contraceptive use declined between 2000 and 2010 even as the average years of education increased. Urban residence had no effect on contraceptive use, explaining why the dramatic increases in percentage of women living in urban areas had no impact on overall fertility. The analysis of the proximate determinants of fertility highlights the importance of contraception as the most significant source of fertility decline in the oPt, with increases in age at marriage having a smaller but significant impact on fertility reduction.

While the downward trend in fertility in the Palestinian territory is similar to that in other parts of the Arab world, what appears to be unique about the oPt is the minimal role of marriage in fertility decline. This stands in contrast to the findings of Rashad (2000) and Eltigani (2005), which both highlight the importance of delayed marriage in declining fertility in Arab nations. Compared to other Arab nations, however, the recent stall in fertility decline in the oPt, given

significant increases in the level of education and urbanization is puzzling. Indeed, compared to the few Arab nations with such high urbanization and education, the fertility levels in the occupied Palestinian territories remains quite high, constituting an ongoing 'demographic puzzle.'

The contribution of this study is the direct approximation of the impact of changes in the proximate determinants on fertility change through a formal decomposition analysis. The results indicate the increasingly important role of contraception, signaling a shift towards more deliberate control of fertility in the oPt. While marriage patterns have not resulted in large changes in fertility, significant fertility decline has occurred because of contraception. If marriage patterns in the oPt begin to shift to older age at marriage similar to changes to nuptiality in other parts of the Arab world, we are likely to see further declines in overall fertility.

The odds of contraceptive use continue to be higher in the West Bank than in Gaza, even taking into account differences in place of residence and education. Once we controlled for women's involvement in contraceptive decision-making, residence in a refugee camp (which have more traditional gender roles) was associated with a higher propensity to use contraception. Although the measures of women's involvement used are fairly limited in scope due to data limitations, they do point to the importance of understanding contraceptive use in light of women's status in society. Women's behaviors cannot be understood strictly within an individualist rational choice framework, but must pay attention to contextual and social factors that weigh heavily on women's decisions and in fact their ability to make decisions. In a context like the oPt, and particularly the Gaza Strip, where there is great cultural emphasis on childbearing and where

involvement in decisions about childbearing often extend to members of the extended family, a contextualized view of fertility behavior becomes increasingly important.

The increased contraceptive use between 1995 and 2006, and the faster rate of contraceptive adoption in Gaza may be related to UNRWA services within Palestinian refugee camps, where family planning is provided through primary health care services. UNRWA family planning services began in 1995[8] and are more prominent in the Gaza Strip, given that about two-thirds of the population of the Gaza Strip are registered refugees and qualify for UNRWA services.

While education is an important determinant of modern contraceptive use, the association between years of education and contraceptive use actually gets weaker over time. This indicates that the uptake of modern contraceptive use among women in the oPt generally increased from 2000 to 2010, variations in the probability of uptake across educational groups are less pronounced. This is indicative of a diffusion effect, where education may have been more important when technologies were initially introduced, but once these technologies became more diffused in society, gaps in uptake between more and less educated women have decreased (Behrman, Kohler, and Watkins 2002; Bongaarts and Watkins 1996).

The last part of the analysis attempts to go further in exploring the impact of women's family size preferences as well as their autonomy or ability to make decisions regarding contraceptive use. Similar to other studies, the results of this study indicate the desire to stop having children and greater women's involvement in the decision to use contraception, substantially increase the odds of contraceptive use (Al-Riyami, Afifi, and Mabry 2004; Dreze and Murthi 2001; Druze

[8] based on author's personal communication

and Mohammed 2006; Link 2011). In many populations, increases in the percentage of women wanting no additional births and increases in the percent of women involved in contraceptive decisions hasten fertility decline. However, the percentage of Palestinian women wanting no additional children actually decreased from 69% in 2000 to 62% in 2010, and the percentage of women involved in decision making about contraceptives declined slightly from 91% in 2000 and 88% in 2010. Given this, the unchanged levels of contraceptive use between 2006 and 2010 are not surprising.

Because data on spousal agreement on fertility preferences and attitudes towards contraception were only available in the 2006 data set, these variables were not included in the analysis for this paper. However, further analysis of the 2006 data (not reported) points to the importance of husbands' attitudes towards contraception as well as couple agreement on the number of children they want to have. The findings indicate that while women's involvement in the decision making process is important, inequalities in spousal relations regarding reproductive behavior and decision making exist. There is some indication that, similar to other studies (Al-Riyami, Afifi, and Mabry 2004; Mason and Smith 2000; Druze and Mohammed 2006), attitudes of the husband seem to play a bigger role in influencing reproductive behavior in this context. These findings further confirm the need for future research that pays attention to the role of men in influencing reproductive behavior as well as intra-household and other social dynamics that shed further light on how decisions are made and how they translate into contraceptive and reproductive behaviors (Hogan, Berhanu, and Hailemariam 1999; Mason 2001; Mason and Smith 2000).

Further research and analyses are necessary in order to fully understand the intra-family dynamics that affect contraceptive decision-making and behavior. It is evident; however, that reproductive health and family planning programs and services should not focus their attention exclusively on educating women about contraception without trying to incorporate men into the process. While the results of this study are not conclusive regarding the exact social mechanisms at play, they do shed some light on the family dynamics that are important to fully understanding contraceptive behaviors in the oPt. The differences in fertility and contraception between the West Bank and Gaza Strip have persisted for at least two decades and probably stem from deeper contextual variations that are beyond the scope of the present paper. Further research would be required in order to understand the regional variations in contraception and fertility behavior.

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Table 1: Summary of Index results for proximate determinants of fertility by region and survey in the occupied Palestinian territories

	West Bank				Gaza Strip				oPt			
Index	**1995-1996**	**1999-2000**	**2005-2006**	**2009-2010**	**1995-1996**	**1999-2000**	**2005-2006**	**2009-2010**	**1995-1996**	**1999-2000**	**2005-2006**	**2009-2010**
Marriage	0.680	0.693	0.667	0.647	0.761	0.758	0.710	0.705	0.707	0.715	0.682	0.666
Contraception	0.588	0.577	0.489	0.480	0.710	0.648	0.606	0.551	0.631	0.603	0.531	0.507
Postpartum Infecundability	0.825	0.829	0.781	0.787	0.796	0.790	0.767	0.767	0.814	0.815	0.775	0.779
Predicted TFR	5.1	5.1	3.9	3.8	6.6	5.9	5.1	4.6	5.6	5.4	4.3	4.0
Observed TFR	5.4	5.5	4.2	4.0	7.4	6.8	5.4	5.2	6.1	5.9	4.6	4.4

Table 2: Decomposition of percentage change in total fertility due to changes in proximate determinants of fertility in the occupied Palestinian territories

	West Bank					Gaza Strip					oPt				
	1995-2000	**2000-2006**	**1995-2006**	**2005-2010**	**1995-2010**	**1995-2000**	**2000-2006**	**1995-2006**	**2005-2010**	**1995-2010**	**1995-2000**	**2000-2006**	**1995-2006**	**2005-2010**	**1995-2010**
Proportion Married	0.019	-0.038	-0.019	-0.030	-0.049	-0.004	-0.063	-0.067	-0.007	-0.074	0.011	-0.046	-0.035	-0.023	-0.058
Contraception	-0.019	-0.153	-0.168	-0.018	-0.184	-0.087	-0.065	-0.146	-0.091	-0.224	-0.044	-0.119	-0.158	-0.045	-0.197
Postpartum Infecundability	0.005	-0.058	-0.053	0.008	-0.046	-0.008	-0.029	-0.036	0.000	-0.036	0.001	-0.049	-0.048	0.005	-0.043
Percentage change in predicted TFR	0.005	-0.249	-0.240	-0.040	-0.279	-0.099	-0.157	-0.249	-0.098	-0.334	-0.032	-0.214	-0.241	-0.063	-0.298

Table 3: Sample characteristics of women in sample included in extended analysis of 2000, 2006, and 2010 surveys

	2000		2006		2010	
	Mean	**Std.D**	**Mean**	**Std.D**	**Mean**	**Std.D**
Age	33.19	9.4	33.85	8.14	35.60	9.18
Education (yrs)	8.60	3.85	9.95	3.24	10.39	3.40
Total Household Members	7.22	3.22	7.31	3.00	6.84	2.60
	N	**%**	**N**	**%**	**N**	**%**
Employed	292	6.74	408	9.85	1,152	11.81
West Bank	2744	63.36	2569	62.04	6,056	62.09
Gaza Strip	1587	36.64	1572	37.96	3,698	37.91
Urban	1,909	48.69	2,076	53.14	5,913	72.7
Rural	1,264	32.24	1,146	29.33	1,411	17.35
Refugee Camp	748	19.08	685	17.53	809	9.95
Involved in contraceptive decision making	3,488	88.96	3,232	81.88	6,828	83.95
Want more children	1,754	44.73	1,796	45.5	3,726	45.81
Don't want more children	2,120	54.07	1,617	40.97	3,880	47.71
Leave to God/Unsure	47	1.20	534	13.53	527	6.48
Using Modern Contraception	1750	40.41	1898	45.83	3,997	49.15
N	**3921**		**3947**		**8133**	

Table 4: Extended Multivariate Logistic Regression Analyses for 2000, 2006, and 2010 Surveys

	2000				2006				2010			
	β	**Std. E**	**OR**	**P-value**	**β**	**Std. E**	**OR**	**P-value**	**β**	**Std. E**	**OR**	**P-value**
Age	0.340	0.038	1.405	**<0.001**	0.318	0.040	1.375	**<0.001**	0.312	0.028	1.366	**<0.001**
Age^2	-0.006	0.001	0.994	**<0.001**	-0.005	0.001	0.995	**<0.001**	-0.005	0.000	0.995	**<0.001**
Age at Marriage	-0.042	0.013	0.959	**0.002**	-0.045	0.012	0.956	**<0.001**	-0.044	0.008	0.957	**<0.001**
Births	0.174	0.021	1.19	**<0.001**	0.133	0.021	1.142	**<0.001**	0.159	0.016	1.172	**<0.001**
Employed	-0.167	0.15	0.846	0.265	-0.042	0.119	0.959	0.727	-0.014	0.080	0.986	0.858
Education (yrs)	0.079	0.012	1.082	**<0.001**	0.037	0.012	1.038	**0.002**	0.049	0.009	1.050	**<0.001**
West Bank	0.480	0.082	1.615	**<0.001**	0.452	0.08	1.571	**<0.001**	0.388	0.054	1.474	**<0.001**
Type of locality-Urban ref												
Rural	-0.078	0.084	0.925	0.355	-0.097	0.084	0.908	0.250	-0.005	0.067	0.995	0.945
Refugee Camp	0.320	0.096	1.377	**0.001**	0.203	0.096	1.225	**0.034**	0.165	0.082	1.179	0.045
Women involved in contraceptive decisions	0.278	0.116	1.320	**0.017**	0.506	0.092	1.659	**<0.001**	0.507	0.068	1.660	**<0.001**
Reproductive Preference-want more children is reference												
No more children	0.952	0.089	2.59	**<0.001**	0.900	0.094	2.46	**<0.001**	1.084	0.067	2.955	**<0.001**
Unsure/leave to God	0.251	0.32	1.286	0.433	0.593	0.111	1.81	**<0.001**	-0.026	0.103	0.975	0.803
N	**3921**				**3947**				**8133**			

Annex:

Table A1: Sample Design-data sources and analytic sample

Survey	Year	Sample					
		# of household interviewed	# of ever married women (15-54)	Response Rate (%)		Analytic Sample[9]	Part II Analytic sample
				Household	Women		
Health Survey (PCBS 1998)	1996	3,934	3,349	98.2	N/A	3082	Not included
Demographic & health survey (PCBS 2000)	2000	6,349	5,729	94.0	99.4	4331	3921
Palestinian Family Health Survey (PCBS 2007)	2006	13,238 (7,056)[10]	10,648 (4,890)	88.0	98.3	4141	3947
MICS	2010	13,629	12,005	92.0	97.4	8996	8133

[9] For Decomposition

[10] It should be noted that for the multivariate analyses utilizing data from the 2006 Palestinian Family Health Survey, data for the household members completing the "large" questionnaire was used. This questionnaire is more detailed than the standard questionnaire that was administered to all households, and includes detailed information on women's attitudes towards family planning, as well as more detailed questions in other sections (including childrearing practices, the elderly, and youth questionnaires). The sample selected to respond to this questionnaire is also representative on the national and governorate levels. In total, 7,056 households took part in the study with a total of 4,890 currently married women between the ages of 15-49. For the 2010 sample, the questions of interest were posed to all women, the selection criteria consisted of age (between 15 and 49) and menopausal status (non-menopausal) resulted in the final analytical model in the extended analysis.

Table A2: Concepts & Measures-Multivariate analysis

Concept	Measure	Data Source	Years of observation
Using modern contraception	Responding positively to using at least one type of modern contraception	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010
Fertility Desire	Woman's stated desire to have another child	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010
Stop childbearing	Woman's stated preference not to have any more children	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010
Uncertain fertility desire	Woman's either stating 'unsure' or 'when God wants' in response to question on whether she wants to have another child	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010
Involvement in contraceptive decision making	Woman reporting that she is either solely responsible for decisions about contraceptive use or that those decisions are made jointly with her husband	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010
Age	Age in years	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010
Age at marriage	Age of woman's first marriage in years	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010
Education	Total years of education	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010
Region of residence	West Bank of Gaza Strip	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010
Type of locality of residence	Dummy variables used for Urban, Rural, and Refugee Camp	2000 DHS, and 2006 PFHS	2000, 2006, 2010
Employment	Indicating working for pay in the past week	2000 DHS, 2006 PFHS, and 2010 MICS	2000, 2006, 2010