HUSBANDS, WIVES, AND IN-LAWS: FAMILY DYNAMICS AND CHILDBEARING BEHAVIOR IN NEPAL

by

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DEDICATION

To my family who have been proud of my accomplishments large and small, and who have supported me through the uncertainties and challenges of the doctoral process even when they didn't understand it.

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ABSTRACT

This dissertation explores relationship dynamics between wives and their husbands' families and the interconnections of these relationship dynamics with childbearing behavior in rural Nepal, a society undergoing dramatic social and demographic change. Despite much theoretical emphasis on the extended family system in many non-Western settings, empirical research integrating the dynamics of women's relationships with their husbands and parents-in-law is rare. This study in a region facing pressing overpopulation and poverty significantly advances our theoretical understanding of family relationships and fertility, and generates new empirical evidence to help policy makers implement more effective fertility-related programs. Giving both theoretical consideration and empirical attention to reciprocal effects between family dynamics and childbearing behavior, I investigate three specific questions: 1) How does co-residence with a mother-in-law affect spouses' childbearing behavior? 2) How does childbearing behavior influence wives' relationship happiness with their mothers-in-law? 3) How does contraceptive use influence change in spouses' relationship dynamics? Data from the Chitwan Valley Family Study enable me to address these questions. I use highly detailed measures of husband-wife and in-law relationship dynamics at two time points and a longitudinal record of childbearing and contraceptive events to provide empirical investigation into these theoretical questions. Results provide new insights valuable for

answering key practical and theoretical questions about family relationships and the transition to lower fertility. Co-residence with a mother-in-law is found to increase the rate of first pregnancy. Childbearing behaviors are also found to have important consequences for relationship dynamics between wives and their mothers-in-law and husbands. Childbearing, particularly bearing sons, is associated with wives reporting happier relationships with their mothers-in-law. Furthermore, using contraceptives, particularly the oral contraceptive pill, may promote increased conflict between husbands and wives. This dissertation should encourage greater integration of husbands and mothers-in-law into family planning programs as a policy tool. Moreover, this study should motivate greater attention to emotions and close personal relationships for deepening our understanding of demographic behaviors.

CHAPTER 1

INTRODUCTION

Although research on fertility has historically focused exclusively on women, theory says that women live in a web of close personal relationships which define the context of reproductive decisions. This dissertation expands our understanding of how relationship dynamics between wives and their husbands' families are intricately linked to childbearing behavior in Nepal, a society undergoing dramatic social and demographic change. This project focuses on dynamics of two relationships that are fundamental to the Nepalese kinship system: the husband/wife relationship and the mother-in-law/daughter-in-law relationship. This research generates new empirical evidence valuable for answering key practical and theoretical questions about family relationships and the transition to lower fertility.

Improved understanding of specific factors linked to childbearing behavior is crucial for policy makers. Despite strong antinatalist policies and family planning programs, Nepal continues to have relatively high fertility and low contraceptive use, particularly in rural areas (CBS 2003; Subedi 1998). In South Asia reducing fertility is a high priority, particularly because of pressing population growth, poverty, and social unrest issues (Haq 1997, 2002; UNDP 2000, 2001). Curbing population growth is believed to be an important tool for improving standards of living, especially for women

and children. Population policies and family planning programs have been a key focus of Nepal's national development plan since early development efforts, yet high fertility currently persists. Recently Nepal has begun to experience a fertility decline, with a total fertility rate (TFR) falling from 5.1 in 1991 to approximately 4.6 in 2001 (Retherford and Thapa 1998, 2004; Suwal 2001). However, this TFR is still relatively high even compared to other Asian countries. New information about dimensions of family dynamics most strongly related to childbearing behavior will be important for creating and implementing more effective public programs to help reach fertility objectives. Moreover, rural Nepalese live in conditions similar to millions of other poor people in rural Asia, particularly in rural China and rural India. Also, family life in Nepal is similar in many ways to family life in nearby regions of South Asia, including Northern India, Bangladesh, and Pakistan. Thus findings from this research may be applicable to other regions facing pressing overpopulation and poverty issues. This knowledge may also be useful in other settings in the non-Western world where high fertility has not responded to national family planning programs.

On the theoretical side, findings from this research will promote a greater understanding of the role of affinal family relationship dynamics in demographic transition. Fundamental theories of demographic transition predict that spousal and in-law relations are key factors producing variation and change in demographic behaviors. However, despite theoretical emphasis on the centrality of family relationships to childbearing behavior, empirical social science has produced virtually no tests of these longstanding central hypotheses. A key reason for this gap in the research literature is that measurement demands for such investigation are extremely high – such a study

requires large numbers of study participants, detailed measures of husband-wife and in-law relationships, and a longitudinal record of subsequent childbearing behaviors, all from a setting in the midst of significant demographic transition. The Chitwan Valley Family Study from rural Nepal is among the first sources of measures to meet all of these criteria and is therefore especially powerful for testing key hypotheses. This resource presents an exceptional opportunity to provide one of the first empirical investigations fully exploring this issue.

Many demographic theories about the family were designed to apply to settings like Nepal, that were primarily agricultural with low levels of education, wage labor opportunities, health services, and mass media, and that were beginning a shift from extremely high fertility and no use of contraceptives to lower fertility and more widespread use of contraceptives. In spite of this, most research on intergenerational/spousal relationships and family formation comes from European and American populations, which are already industrialized and have low levels of fertility and widespread use of contraception. This dissertation fills a substantial gap in the literature by providing vital empirical examples from a setting where the interrelationship of family dynamics and fertility is likely to be even stronger and more relevant to demographic theory. Rural Nepal is an excellent setting to examine family dynamics and childbearing behavior because recent dramatic social changes create variation in spousal and in-law relationships and because this population only recently began a gradual decline in fertility and transition to widespread use of contraception. The results will provide valuable new insights into extended family dynamics in non-Western contexts

and demonstrate the potential for broadening theories of interpersonal relationships outside of Western settings.

The topic of family relationships is also high priority because despite changing world demographics, individuals continue to find family relationships fundamentally important to their health and well-being (Antonucci, Jackson and Biggs 2007). This dissertation is differentiated from much previous research on family relationships by its emphasis on understanding family dynamics and childbearing behavior within the context of the husband's family. Most of the sophisticated studies of intergenerational relationships and family formation focus on the parental family. In the Nepalese context however, "affinal" relationships, which are relationships created through marriage, are also likely to be extremely salient to women's family and demographic behaviors. This is because historically in this setting upon marriage a daughter leaves her natal home and lives with her husband's family, under the authority of the mother-in-law and husband (Gurung 1998; Suwal 2001). Girls grow up acutely aware that their time in the natal home is transient, and that they will become identified with their affinal family. Despite importance as critical features of the Nepalese family, exploration of the specifics of the relationships between mother-in-law and daughter-in-law and between husband and wife have been neglected areas of research. As a whole, this research advances the conceptualization of the husband's family as an important social unit in which family formation occurs. Results point to the importance of integrating women's relationships with their husbands and parents-in-law into empirical research on childbearing behavior.

In addition, this analysis should motivate greater attention to emotions and close personal relationships in social demographic research. It has been suggested that closer

engagement with the psychology of interpersonal relationships and emotions will yield a more comprehensive understanding of demographic behaviors (Basu 2006; Hobcraft 2006; Massey 2002). Decisions about reproduction have roots in the nature of close personal relationships, and emotions are an intrinsic part of these relationships (Hobcraft 2006). However, the role of emotions in relationships is largely missing from the understanding of demographic outcomes, which are generally explained within a framework of cognition and rationality (Basu 2006; Massey 2002). Incorporating the psychology of interpersonal relationships should be a high priority for new demographic research (Hobcraft 2006). Hobcraft (2006) advocates engagement with psychology in order to shift research on demographic behavior from a narrower focus on events (e.g. marriages, births) to a broader focus on dynamic processes when people interact (e.g. partnership and intimacy, personal ties). Despite some advances, there remains much progress to be made on this substantial and daunting task. The research contributes to that effort by drawing on theories from psychology to develop a more theoretically rich understanding of close personal relationships that have major implications for demographic behaviors.

In this dissertation the concept of interdependence is a key theoretical concept in models of family dynamics and childbearing behavior. Interdependence is the central defining characteristic of relationships between actors (Blau 1964; Kelley and Thibaut 1978; Thibaut and Kelley 1959). Interdependence between actors stems from their relative control over each others' outcomes, which is determined by their position in a social structure and by cultural factors. Within interdependent dyads or small groups, actors engage in exchange, negotiation, bargaining, and strategic action to influence

others and pursue individual or collective goals (Cook 1995). Thus interdependence theory explains behaviors in close relationships by examining characteristics of the relationship itself, rather than the individuals who comprise the relationship. In other words, interdependence theory is oriented toward interpersonal rather than intrapersonal processes (Rusbult and Arriaga 2000).

Within a family system, members of a family are held together by degrees of interdependence. These patterns of interdependence define the nature of relationships; thus a change in one family member results in a change in another family member (Chibucos, Leite, and Weis 2005). Building on this theoretical concept, this dissertation identifies two affinal family relationships characterized by interdependence: the mother-in-law/daughter-in-law relationship and the husband/wife relationship. I develop context specific hypotheses outlining the various mechanisms through which childbearing and these two affinal relationships may influence each other. I recognize that effects between family dynamics and childbearing behavior can run either direction; thus I give both theoretical consideration and empirical attention to each direction of association. In the first analytic chapter I model childbearing behavior as an outcome affected by family dynamics, and in the second and third analytic chapters I model family dynamics as an outcome affected by childbearing behavior. I begin each analytic chapter by describing the theories and frameworks I rely on to generate the causal pathways through which family dynamics and childbearing behavior are likely to be connected.

I now give a brief summary of this research and how it is presented in this dissertation. In Chapter 2 I describe the setting for this research: the Chitwan Valley in rural Nepal. The rapid social change occurring in the Chitwan Valley makes it an ideal

setting in which to examine family relationships and childbearing behavior. The Chitwan Valley has only recently experienced fundamental transitions toward lower fertility and widespread use of contraception. Furthermore, recent dramatic social, economic, and institutional changes have promoted the emergence of marital relationships based on a close emotional bond between husbands and wives (Hoelter et al. 2004). Thus there is substantial variation in both spousal and in-law relationships among the population in this study area. This chapter gives a brief discussion of the economic, social, and demographic history of the Chitwan Valley. I present additional detail of how marital relationships have changed over time. I also present a detailed description of extended family living in this setting, paying particular attention to both behavior and attitudes regarding living in joint family households.

Chapter 3 contains descriptions of the survey data that I use to test the hypotheses in this dissertation. I describe the data and its various components in detail. I also discuss two general methodological concerns common to many of the analyses in this research – endogeneity and measurement of emotions in close relationships. Because each analytic component requires different measures and analysis strategies, I describe specific measures and model estimation techniques in later analytic chapters.

Chapter 4 contains the first set of substantive analyses in this dissertation. In this chapter I examine how co-residence with a mother-in-law affects subsequent childbearing behavior. I consider multiple measures of co-residence and analyze their effects on childbearing behavior in a hazard model framework. I model the influence of co-residence on both pregnancy and permanent contraceptive use, because these events mark the beginning and ending of childbearing.

In Chapters 5 and 6 I present analyses of changing family dynamics over time. Chapter 5 focuses on how wives' childbearing experiences influence their reported relationship happiness with their mothers-in-law. This is particularly innovative because I provide the first detailed empirical examination of childbearing and in-law relationship quality in a non-Western setting where mothers-in-law are especially influential. Chapter 6 focuses on how experiences using contraceptives influence changing marital dynamics. I consider several different dimensions of the husband-wife relationship including domestic violence, disagreement, and emotional bond. In each of these chapters I examine childbearing/contraceptive experiences as predictors of variation in mother-in-law/marital dynamics from one time point to another. Predicting change in family dynamics over time allows for much stronger inferences regarding the possible causal roles of childbearing behavior, as compared to analyses of cross-sectional data or longitudinal data without controlling for earlier levels of family dynamics.

Finally, Chapter 7 is a conclusion chapter. I provide brief summaries of the empirical results in Chapters 4-6 and discuss the implications of these findings in terms of theoretical, program, and policy development.

CHAPTER 2

SETTING

In this chapter I describe the setting for this dissertation – the Chitwan Valley of Nepal. I begin with a brief overview of Nepal in general to familiarize readers with the country. I then provide a detailed description of the Chitwan Valley, paying particular attention to how family behaviors and attitudes have changed over time among the individuals living in the study area.

Nepal

Nepal is a land-locked country on the Asian continent with an area of about 54,000 square miles. Nepal lies along the southern rim of the Himalayan Mountains. To the north is the desert plateau of Tibet in China, and to the south are the northeastern plains of India (see Figure 2.1). Nepal is roughly rectangular, extending approximately 525 miles east to west and approximately 90 to 140 miles north to south (Harris et al. 1973). Considering how small this area is, Nepal's terrain makes dramatic transitions. The Himalayan mountain range in the north contains 10 of the world's highest peaks including Mt. Everest, the world's tallest mountain. In the short distance between the Himalayas and the southern border of Nepal, the land elevation drops to near sea level and the land rapidly changes from extremely high mountains to rolling hills in the central

region (where the capital city of Kathmandu is located) and then to flat jungle and farmlands near the Indian border (where the Chitwan Valley is located).

(*Figure 2.1, about here*)

Like its geographical terrain, the population of Nepal is extremely diverse. Generally the inhabitants of northern Nepal derive from Tibetan and Mongoloid ancestry, whereas inhabitants of southern Nepal derive from Indian ancestry (Dastider 1995). However, within Nepal there are more than 100 distinct ethnic groups (CBS 2002). Among the many various ethnic groups in Nepal, the two main religions practiced are Hinduism and Buddhism. Nepal was an official Hindu state until 1991, and 80% of the population is said to be Hindu (CBS 2002). This official statistic may be misleading however, because Nepal census takers often place people in the Hindu category unless they specifically declare themselves otherwise (Bista 1991). However, in Nepal religious affiliation is not based on exclusive categories; thus a forced choice survey question on religious affiliation does not capture the extent to which the Nepalese combine religions. Many people in Nepal blend philosophies and rituals from Hinduism, Buddhism, and indigenous religions to form the concept of *dharma* or a general way of living (Pearce 2000).

With a per capita income of only $470 per person per year in 2009, Nepal ranks among the world's poorest countries. Of its population of 28.8 million people, approximately one-third live below the absolute poverty line. The Nepalese economy is dominated by agriculture; it provides a livelihood for three-fourths of the population. Despite some socioeconomic advances such as increased literacy rates, Nepal's expanding population is considered an obstacle to further development. Nepal's

population grew dramatically throughout the 20th century: in 1961 the total population was 9.4 million, and by 1991 it had doubled (Dahal 1993). Moreover, Nepal's population structure is very young: of the total population, 41% are under age 15 (PRB 2006). Finally, average ages at marriage and first birth increased only slightly during the 20th century. The average age at first marriage increased from 15.4 years in 1961 to 17.1 years in 1996, and the average age for a Nepalese woman to give birth to her first child increased from 18 years in 1971 to 19 years in 1996 (MOPE 2000). These demographic characteristics make it likely that Nepal's population will continue to grow during much of the early 21st century. In fact Nepal's population is projected to reach 36.1 million as soon as 2025 (PRB 2006).

Since the early 1960s the Nepalese government has implemented a series of programs to reduce population growth by encouraging contraceptive use, raising the standard of living, and providing better reproductive and maternal healthcare facilities and education (Joshi 1995). However, these programs have had only minimal success as fertility in Nepal remains relatively high in rural areas. The total fertility rate (TFR) was 5.1 as recently as 1991, and declined to a TFR of approximately 4.6 by 2001 (Ghimire 2003; Suwal 2001; Tuladhar 1989). Recently Nepal's TFR was estimated at 3.1, but fertility is considerably higher in rural areas (3.3 births per woman) than urban areas (2.1 births per woman), where fertility is at replacement level (MOHP 2007). Regarding contraception, the contraceptive prevalence rate has grown (from 4% in 1976 to 34% in 1996 to 44% in 2006). However, the dominant method used in Nepal continues to be female sterilization (Brunson 2010). Thus in spite of recent increases in contraceptive use, the timing of stopping childbearing remains the main source of variation in

completed number of births. Overall knowledge about temporary methods that could serve to space births and thus reduce the total number of births remains low. Like fertility rates, there are considerable differentials in contraceptive use by urban-rural residence. Women in urban areas are more likely to use a family planning method than rural women, reflecting wider availability and easier access to methods in urban than in rural areas. Finally, the gap between wanted and observed fertility rates is greater among women living in rural than in urban areas (MOHP 2007).

The Chitwan Valley

The Chitwan Valley, the specific study area for this dissertation, is located in the low lying plains in south central Nepal known as the Terai region. The Chitwan Valley is considered the "inner Terai" because a low range of mountains separates it from the rest of the Terai. The valley is bordered in the northwest by the Narayani River, in the south by the Royal Chitwan National Park, and in the northeast by the Mahendra Highway, which runs the whole width of Nepal through the Terai region (see Figure 2.2).

(*Figure 2.2, about here*)

The Chitwan Valley has been a setting of rapid social change. Until the 1950s this valley was covered with virgin jungle and sparsely inhabited by indigenous ethnic groups (Guneratne 1994). The jungle was malaria infested, warding off outsiders. In 1955 the government (with assistance from USAID) opened this valley for settlement by deforesting the land and implementing malaria eradication efforts. With its highly fertile soil and warm climate, this prime farmland drew settlers from across Nepal. Soon Chitwan became a melting pot of migrants from many different ethnic groups. Upper Caste Hindus and Lower Caste Hindus, whose ancestors originate from India, used the

opening of the valley to obtain excellent farmland. The valley also experienced an influx of migrants of Tibetan origin: Newars, another elite group in Nepal who practice a mixture of Buddhism and Hinduism, and Hill Tibeto-Burmese groups who tend to practice Buddhism. The original inhabitants of the Chitwan Valley, the Terai Tibeto-Burmese, were largely left without good farming land and have been much less able to take advantage of the social changes occurring around them than other groups (Guneratne 1996).

Between 1978 and 1984, a bridge was built across the Narayani River and major roads were built linking Narayanghat, Chitwan's largest town, to India and to other cities across Nepal, turning Narayanghat into Nepal's major transportation hub. Thus in short the Chitwan Valley transformed from isolated malaria-infested jungle to prime farmland and a vital urban transportation stop in less than 30 years. Since becoming a business hub of the country, the valley has seen expansion in services and infrastructure including schools, health clinics, markets, wage work, bus services, and the mass media (Axinn and Yabiku 2001). Previous work from this study area shows that there have been sharp increases in school enrollment, visits to health clinics, employment outside of the home, and exposure to different sources of mass media in recent birth cohorts (Axinn and Barber 2001; Axinn and Yabiku 2001; Ghimire, Axinn, Yabiku, Thornton 2006; Yabiku 2004). For example, educational enrollment has risen from virtually zero in the 1960s to 100% of both sexes entering first grade by 1996 (Beutel and Axinn 2002).

These physical changes led to similarly dramatic demographic changes among the residents of Chitwan. For example, the mean number of children ever born has decreased and the use of contraceptives has increased. Table 2.1 displays the mean number of

children ever born to women of various cohorts using data from the 1996 Chitwan Valley Family Study (CVFS). These numbers generally match fertility trends throughout Nepal, dropping with each younger age group. The mean number of total children ever born to women age 55 and older in 1996 was 5.72, but for women ages 35 to 44 it was 4.47. Of course women in the youngest cohorts may have gone on to have more children, but given the substantial drop in the mean number of children they had already borne at the time of the survey, it is unlikely that the mean number of total children born will increase enough to offset the clear trend of decreased fertility by cohort.

(*Table 2.1, about here*)

Table 2.1 also displays, by birth cohort, the percent of ever-married women who had ever used any contraceptive method by 1996. Across the older cohorts, the large differences demonstrate a tremendous change in the level of contraceptive use (from 29% of women age 55 and older to 69% of women ages 35-44). Again, the decreases in percentages in the youngest cohorts are likely due to age truncation – that is, many of the women in these groups were still having children and had not been at risk of using a contraceptive method for as long as the older women. Nevertheless, the high proportions of women in the younger groups who had already used a contraceptive by 1996 suggest that the trend of increasing contraceptive use with each younger cohort will continue.

Important for the research in this dissertation, the dramatic changes in the social, economic, and institutional context of the Chitwan Valley have been accompanied by changes in marital processes and the meaning of marital relationships. Marriages in Hindu areas of South Asia have a long history of being arranged by parents and the parental family, with no involvement of the husband and wife-to-be in the choice of the

spouse (Banerjee 1984; Berreman 1972; Majupuria and Majupuria 1989). Historically love, attraction, and an emotional bond between spouses were not important expectations of the marital relationship (Bennett 1983; Fricke 1986). However, the spread of new services in the community as well as exposure to new ideas about marriage that differ from historically common ideas in South Asia have stimulated new marital expectations and behavior. This is because these new organizations and services shifted daily life outside of the domestic sphere, exposing younger generations to new ideas about the family (Axinn and Yabiku 2001; Thornton 2005). For example, education based on Western teaching materials and mass media originating in the West have been primary factors promoting Western cultural ideas about marriage (Barber and Axinn 2004; Caldwell 1982; Caldwell, Reddy and Caldwell 1985; Hornik and McAnany 2001). School and the media are likely to romanticize the nuclear family and foster more positive attitudes in children toward later marriages, love marriages, and independence from extended family (Caldwell 1982; Thornton, Chang and Sun 1984; Thornton and Lin 1994; Axinn and Barber 2001). In fact, ethnographic work has shown that the concept of romantic love has in recent years become associated with economic development for many Nepalis (Ahearn 2001).

Previous empirical research in this study area has demonstrated trends toward later marriage, less arranged marriage, and more emphasis on the positive emotional bond between husbands and wives, and that these trends are encouraged by access to services such as schools, employers, health services, and bus stops (Ghimire et al. 2006; Hoelter et al. 2004; Yabiku 2004, 2006). For example, the mean age at marriage for those married between 1956 and 1965 was just over age 16, for those married between 1966 and 1975 it

was nearly age 18, and for those married between 1996 and 2002 it was nearly 21. Likewise, the proportion of individuals who participated in choosing their spouse rose from virtually zero among those who married between 1936 and 1945 to approximately 50% among those who married between 1986 and 1995 (Ghimire et al. 2006). Experiences outside of the family such as school, work, or youth clubs have been associated with greater participation in the choice of a spouse (Ghimire et al. 2006). Finally, greater exposure to premarital nonfamily experience has been linked with marriages characterized by higher levels of love and discussion between spouses, and lower levels of conflict and spouse abuse (Hoelter et al. 2004).

Because changing dynamics of husband-wife relationships are important to this dissertation, I document trends over time in several of these dynamics in Tables 2.2a and 2.2b. In both of these tables in the first column I show percentages for individuals ages 15 to 34 and married at the time of the 1996 interview. In the second column I compare these percentages to those for individuals ages 15 to 34 and married at the time of the 2008 interview. Among the first three marital relationship dynamics listed in Table 2.2a – disagreement, criticism, and domestic abuse – there was hardly any change in the levels of these dynamics between 1996 and 2008. However, the percent of respondents reporting that they love their spouse very much or some increased by 10 percentage points, which is a considerable change in 12 years.

(*Table 2.2a, about here*)

In Table 2.2b the samples in each column are further limited to respondents not sterilized at the time of the interview. The two marital relationship dynamics listed in Table 2.2b focus on spousal communication, first about the number of children to have

and second about contraceptive methods. The frequency of discussion increased for both of these topics between 1996 and 2008. Respondents reporting that they discuss the number of children to have often or sometimes with their spouse increased from 64% to 74%. Even more dramatic, respondents reporting that they discuss contraceptive methods often or sometimes with their spouse increased from 55% to 69%. In general, love and communication, dynamics associated with a closer conjugal bond, seem to be becoming more prevalent over time in this study setting.

(*Table 2.2b, about here*)

A final important aspect of this setting concerns household structure. Historically in this study setting household structure has been characterized by the extended family system, with three generations living with or in close proximity to each other. In Nepal households have been characterized by patrilocal residence, where married couples become absorbed into the husband's parents' existing household. Thus in this setting when a young woman gets married she joins the husband's family as an outsider. The new wife comes under the authority of her parents-in-law and husband, and this authority is most exercised by the mother-in-law in daily domestic tasks (Gray 1990).

As the emphasis on the emotional bond between husbands and wives increases in this setting, the relationship of spouses to their elders and extended families may weaken. Because co-residence with the extended family may be seen as restrictive to an intimate spousal bond, and because the financial ability to establish a new household may be facilitated by non-family labor force opportunities, couples may shift toward neo-local residence. In Table 2.3 I examine trends over time in women living with in-laws. In 1996 there was little difference across cohorts regarding having ever lived with in-laws.

Among all ever-married women 79% had ever lived with their in-laws, and these levels remain very high across all cohorts. Despite the fact that the vast majority of married women still experience patrilocal residence in this setting, the prevailing attitude is that family structure will shift toward the nuclear family model. In the 2008 interview, in response to the question "Do you think married couples who live with their parents or in-laws will increase or decrease in Nepal during the next twenty years?" 71% of all respondents answered "decrease".

(*Table 2.3, about here*)

Finally, given the dramatic changes in social context in the Chitwan Valley, it is likely that attitudes about household structure have changed. Table 2.4 displays the percent of all respondents who strongly agree that a married son should live with his parents in their old age, by cohort, first for respondents interviewed in 1996 and then for respondents interviewed in 2008. There has been remarkably little change in this sentiment; many individuals across every cohort continue to strongly agree with this statement. In fact in the 2008 interview, in response to the question "Overall, which do you think is better for most people in Nepal today – married children living with their parents or in-laws, or married children living separately?" fully 86% of all respondents chose "living with their parents or in-laws" as their answer.

(*Table 2.4, about here*)

However, consider the trend shown in Table 2.5. Here I examine the percent of respondents who either strongly agree or agree that a daughter-in-law should obey her mother-in-law after coming to her husband's home. Across the board, every cohort demonstrates a clear decrease in the level of agreement with this statement. The change

among individuals ages 45 to 54 is most dramatic, dropping from 67% to 44% who are in agreement with this statement.

(*Table 2.5, about here*)

Overall, this setting appears to be in the midst of a transition in household structure. On the one hand, many residents of the Chitwan Valley still feel strongly that married couples should live with the husband's parents, and many married women do continue to experience this type of patrilocal extended family living. On the other hand, residents of the Chitwan Valley are decreasingly likely to advocate that daughters-in-law should obey their mothers-in-law, and most people think that extended family co-residence will decrease in the future.

Figure 2.1. Location of Nepal in the World

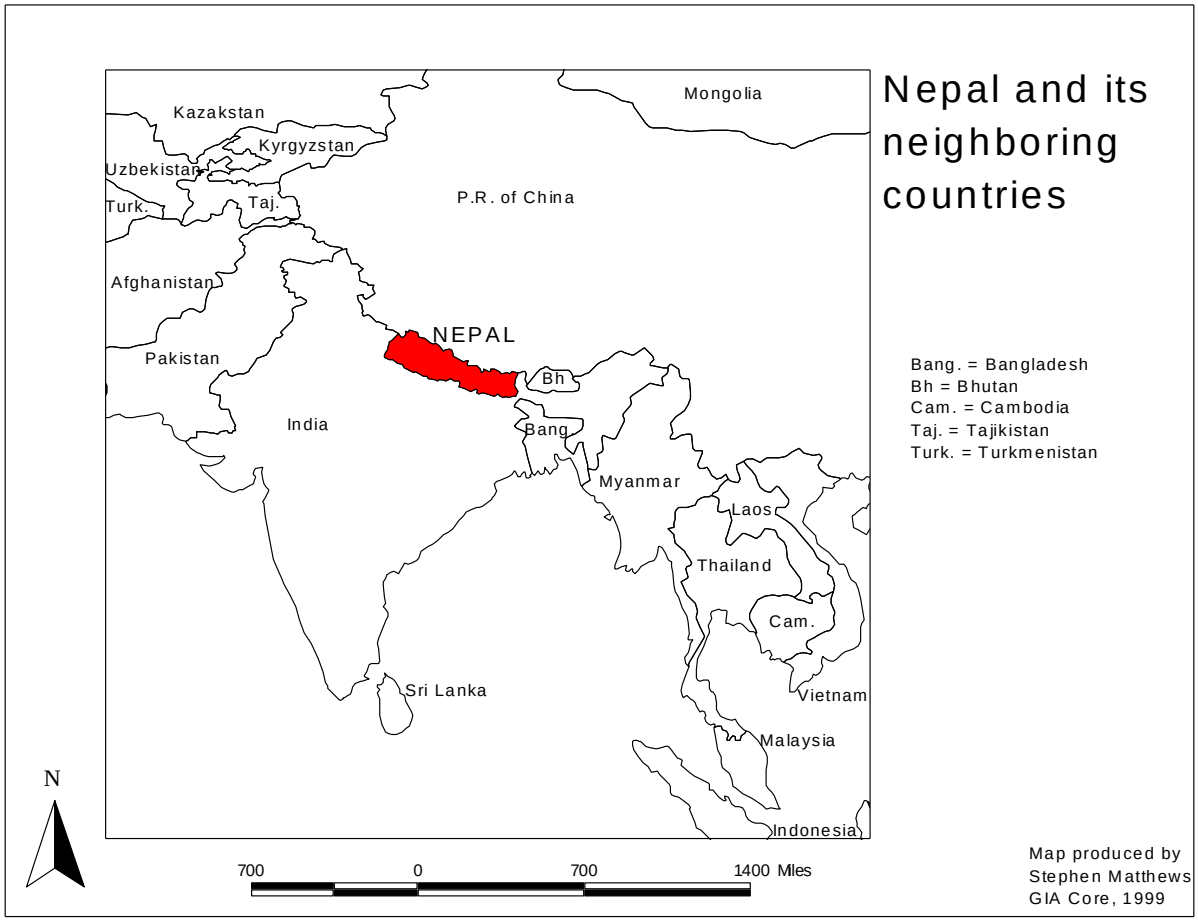

Figure 2.2. Chitwan Valley Study Area

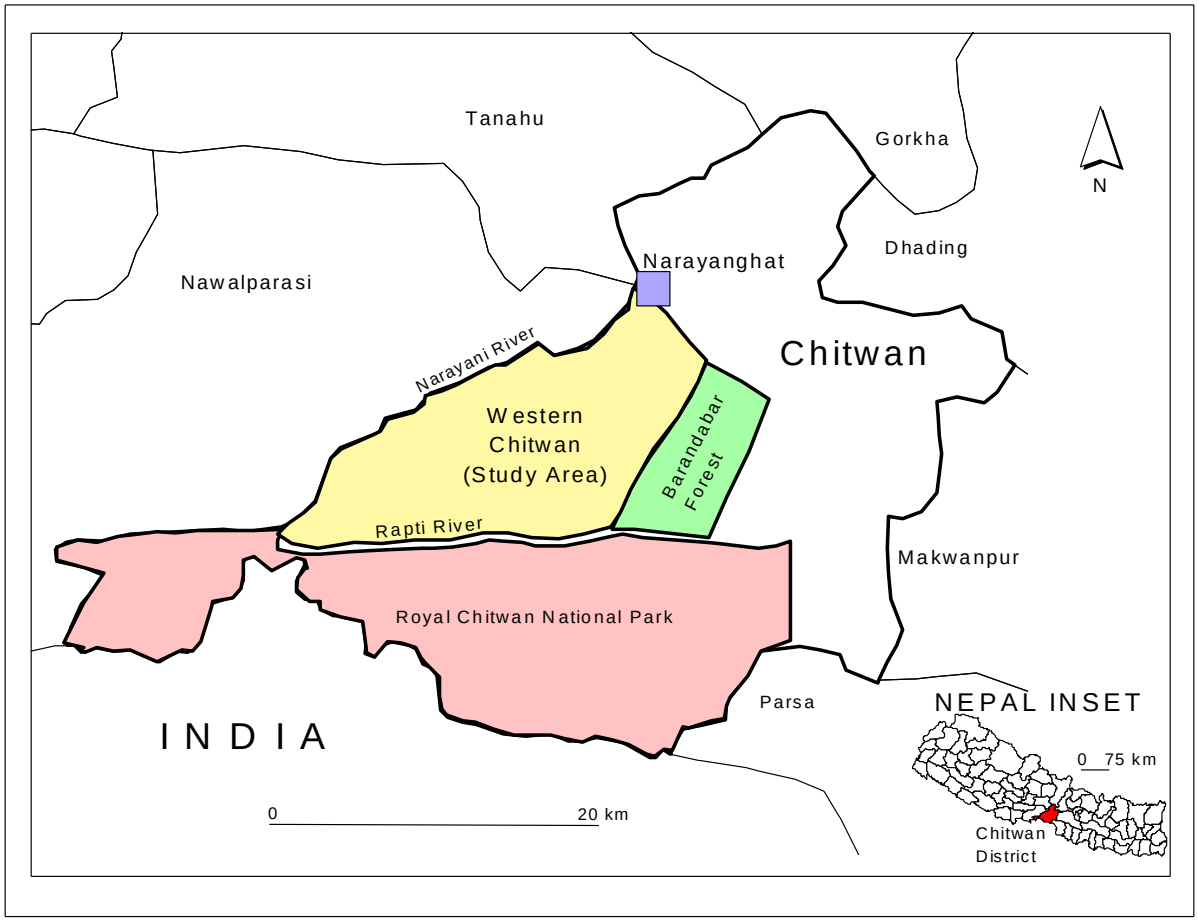

Table 2.1. Number of Children Ever Born and Percent Who Have Used a Contraceptive, by Age at Time of Survey, for Ever-Married Women in 1996

	Age at Time of Survey					
	15-24	25-34	35-44	45-54	55+	Total
Mean Number of Children Ever Born	1.33	2.96	4.47	5.65	5.72	3.53
Percent Who Have Used a Contraceptive	32%	61%	69%	53%	29%	53%
N	494	620	505	358	104	2081

Table 2.2a. Marital Dynamics (percentages) for Currently Married Respondents Age 15-34 At Time of Survey

	1996 Survey (N=1907)	2008 Survey (N=2443)
Disagreements with Spouse (Frequently or Sometimes)	13%	16%
Criticism from Spouse (Frequently or Sometimes)	9%	9%
Ever Beaten by Spouse (Yes)	9%	9%
Love Spouse (Very Much or Some)	79%	89%

Table 2.2b. Marital Dynamics (percentages) for Currently Married Respondents Age 15-34 and Not Sterilized At Time of Survey

	1996 Survey (N=1443)	2008 Survey (N=1941)
Discussion of Number of Children (Often or Sometimes)	64%	74%
Discussion of Contraceptive Methods (Often or Sometimes)	55%	69%

Table 2.3. Percent Who Have Ever Lived with In-Laws, by Age at Time of Survey, for Ever-Married Women

	Age at Time of Survey					
	15-24	25-34	35-44	45-54	55+	Total
1996 Survey	81%	83%	80%	72%	73%	79%
(N)	(494)	(620)	(505)	(358)	(104)	(2081)

Table 2.4. Percent Who Strongly Agree that a Married Son Should Live with His Parents in their Old Age, by Age at Time of Survey

	Age at Time of Survey					
	15-24	25-34	35-44	45-54	55+	Total
1996 Survey	58%	60%	63%	71%	70%	62%
(N)	(1886)	(1295)	(1008)	(715)	(367)	(5271)
2008 Survey	60%	59%	63%	68%	73%	63%
(N)	(1670)	(2098)	(1554)	(1112)	(1022)	(7456)

Table 2.5. Percent Who Strongly Agree or Agree that a Daughter-in-Law Should Obey Her Mother-in-Law After Coming to her Husband's Home, by Age at Time of Survey

	Age at Time of Survey					
	15-24	25-34	35-44	45-54	55+	Total
1996 Survey	54%	50%	54%	67%	75%	56%
(N)	(1886)	(1295)	(1008)	(715)	(367)	(5271)
2008 Survey	37%	34%	38%	44%	59%	40%
(N)	(1670)	(2098)	(1554)	(1112)	(1022)	(7456)

CHAPTER 3

DATA AND METHODOLOGICAL ISSUES

In this chapter I introduce the survey data that I use to estimate statistical models of family dynamics and childbearing behavior. I begin with a description of the dataset, as it is composed of several data sources. Because each set of analyses requires different samples, measures, and model estimation techniques, I describe these in their respective analytic chapters (Chapters 4, 5, and 6). I close this chapter by addressing two general methodological concerns that may recur throughout this work: endogeneity and the measurement of emotions in close relationships.

Data

To test the empirical predictions I take advantage of the Chitwan Valley Family Study (CVFS), a unique longitudinal dataset that is especially powerful for testing my hypotheses. The CVFS consists of survey data from a sample of 171 neighborhoods in the western part of the Chitwan Valley in south central Nepal. Neighborhoods are defined as clusters of approximately 5 to 15 households. In 1996 all individuals ages 15 to 59 living in the selected neighborhoods were interviewed. In addition, all married respondents' spouses who did not meet the sample selection criteria were interviewed. Therefore, the data include interviews with spouses who were temporarily living outside the selected neighborhood, or who were over age 59 or under age 15. This ensured that

complete spousal information was obtained from all married respondents in the main sample. The overall response rate for this survey was approximately 97%, or 5,271 completed interviews. All interviews were conducted in the most common language in Nepal (Nepali); thus question wordings presented are translations of the original text.

The analyses presented here use data from four separate sources: household census and relationship grids, individual questionnaires, individual life history calendars, and prospective monthly panel data collection. Immediately below I describe these data sources.

Household Census and Relationship Grids. A household-level survey was used to collect two types of information: a census and a within-household relationship grid. The census form listed all household residents (defined as having eaten or slept in the household for at least three of the past six months at the time of the study) and anyone who was married to one of these listed residents. Then, a relationship grid was used to measure the relationships of each listed resident to every other listed resident. This complete household relationship enumeration facilitates measures of co-residence with mothers-in-law.

Individual Questionnaires. Structured questionnaires were administered in person to eligible respondents and their spouses between August 1996 and February 1997. These questionnaires collected a wide array of demographic, economic, social and attitudinal information, including rich measures of marital and intergenerational relationship dynamics. To measure changes in these domains, measures from the 1996 baseline survey were included in interviews recently fielded in 2008 for an expansion project of the CVFS, entitled "Ideational Influences on Marriage and Childbearing". The survey

questions which are repeated from the 1996 baseline interview are worded identically in the 2008 individual questionnaires, creating an exciting opportunity to update measures of this study population's experiences, attitudes, and relationships. The analyses in this dissertation are among the first to take advantage of this newly available data.

Individual Life History Calendars. In addition to the structured questionnaire, life history calendar techniques were used to collect reliable and detailed life histories for respondents. Life history calendars featured descriptions of important national and neighborhood events as timing cues to record chronological information about respondents' past marital, childbearing and contraceptive events, education, and labor force participation. This exact date information allows the construction of measures of the precise timing of marriages and childbirths. For a complete description of the life history calendar technique see Axinn, Pearce, and Ghimire 1999.

Prospective Monthly Panel Data Collection. Since February of 1997, a prospective panel study of demographic events has been maintained for 151 of the original neighborhoods. These neighborhoods include 4,632 individuals interviewed in the original study, and provide the full contextual and ethnic heterogeneity embedded in the original study design. Interviewers visit each household monthly to record detailed demographic events for all respondents interviewed in 1996 including those who moved out of the study area. Events recorded include pregnancies, births, deaths, marriages, and contraceptive use (including each of the following: Depo-Provera, IUDs, Norplant, oral contraceptive pills, condoms, foam/jelly/cream/spermicides, husband or wife sterilization, abstinence, and indigenous contraceptive methods). Over time, the monthly demographic event registry has maintained the extraordinarily high response rate of 96%.

This extremely high response rate helps ensure that attrition from the panel will not seriously threaten the validity of analyses based on these data.

Common Issues in the Estimation of Intergenerational/Spousal Models

Overall, the analyses in this dissertation face two important challenges. First, because wives and mothers-in-law are not randomly assigned into households, conclusions from these analyses may be threatened by endogeneity bias or unobserved heterogeneity producing the observed results. Second, because this analysis uses subjective measures of emotions about close relationships, conclusions from these analyses may be threatened if these measures do not capture the intended concepts. Below I describe each of these issues and the strategies I use to address them.

Endogeneity. As with all studies of family dynamics and individual behaviors, these analyses face threats to the validity of conclusions about causal connections because they are based on observational study design. For example, a husband or his parents may choose a specific wife who possesses characteristics unobserved in the models which influence both her relationship with the affinal family and her childbearing behavior. Or, a particular type of mother-in-law may possess characteristics which influence her likelihood of living with her married son as well as influence her daughter-in-law's childbearing behavior. These situations could lead to overestimates of the causal relationship between family dynamics and childbearing behavior. Because of this threat I take two special precautions in these analyses.

First, I include measures for as many theoretically relevant factors as possible. Fortunately, the data used for this dissertation are highly detailed and comprehensive, supplying more measures than have historically been available to researchers. Therefore I

am able to include in models measures of many of the factors that could be pointed to as possible explanations for observed effects. For instance, I include a wide range of characteristics of the wife's background that may influence both her relationships with her affinal family and her childbearing behavior. I can also examine the process of how the wife came to be in her marriage by including a measure capturing the extent of her participation in the choice of husband.

Second, I examine measures of situations which may shape the dynamics that I use as independent variables in models. Consider a model predicting the influence of a co-resident mother-in-law on contraceptive use as an example. I can investigate which prior situations predict having a co-resident mother-in-law, in order to consider how the model may be affected by the non-random assignment of co-resident mothers-in-law. Exploiting such measures will enable me to test the robustness of models.

In Tables 3.1a and 3.1b I compare some basic demographic characteristics of married women between age 15 and 34 in 1996 according to mother-in-law co-residence. In each table women with a co-resident mother-in-law are compared to a different reference group: in Table 3.1a the reference group is women whose mothers-in-law are alive but not residing in the same household, and in Table 3.1b the reference group is women whose mothers-in-law are dead. In each table I present percentages of respondents with various demographic characteristics by mother-in-law co-residence, and I assess whether the percentages in each category are different between the two groups. In Table 3.1a the overall pattern of age differences is that women with co-resident mothers-in-law are younger than women without co-resident mothers-in-law, and their husbands are younger as well. Both wives and their husbands are significantly more

likely to be in the younger age group (age 15 to 24) when living with a mother-in-law. This cannot be explained by the fact that older women's mothers-in-law may have died, as this sample is limited to women whose mothers-in-law are alive at the time of the interview. Differences in ethnicity between these two groups are not large. Women residing with mothers-in-law are slightly less likely to be Lower Caste Hindu and slightly more likely to be Terai Tibeto-Burmese, but overall ethnicity does not seem to condition whether a woman lives with her mother-in-law. School and household wealth (measured here by whether the household owns the land on which the house is built) however, are significantly different between women who do and do not have co-resident mothers-in-law. For women who live in households with their mothers-in-law, it's more likely that these women went to school before marriage, that their husbands went to school before marriage, and that the household owns its land plot. Finally, it is not surprising that we see large differences in childbearing. Women with a co-resident mother-in-law are less likely to have borne any or multiple children, but this is probably because these women are younger and have been to school, both characteristics reducing their likelihood of childbearing.

(*Table 3.1a, about here*)

Next, in Table 3.1b, a similar pattern of differences appears between women with a co-resident mother-in-law and women whose mothers-in-law are dead. Women with a co-resident mother-in-law are again younger, have younger husbands, are more likely to have been to school and have husbands who have been to school, are more likely to live in a household that owns its land plot, and have had fewer children, compared to women whose mothers-in-law are dead. Because of the evidence shown in both Tables 3.1a and

3.1b that certain characteristics may shape the likelihood of living with a mother-in-law, I will be careful to control for these characteristics in multivariate models. Furthermore because women whose mothers-in-law are dead differ on demographic characteristics by greater percentages, in models predicting the influence of a co-resident mother-in-law on contraceptive use I will limit the sample to women with living mothers-in-law to have a more similar comparison group.

(*Table 3.1b, about here*)

I also compared some characteristics of mothers-in-law who completed their own individual interviews in 1996 to all ever-married women over age 45 interviewed in 1996 (analysis not shown). Women counted as mothers-in-law seem slightly more likely to have had their first birth under age 18 and to have given birth to more children, compared to all older women. This is a sensible result since having a married son was necessary to be counted as a mother-in-law. However, these women had extremely similar responses to various attitudinal questions about childbearing, and their literacy rates were virtually identical. These diagnostic analyses of course do not eliminate all endogeneity issues, but they allow me to investigate how sensitive estimates may be to this issue. Because the mothers-in-law were so similar to all older women in the dataset, I conclude that the threat of endogeneity bias for conclusions based on models estimating effects of co-resident mothers-in-law will be minimal.

Measuring Emotions in Close Relationships. Measures of emotions in relationship dynamics are largely missing from the understanding of demographic behaviors. This may be because emotions such as love have been considered non-quantifiable by standard demographic surveys. Incorporating measures of love and

relationship happiness into research on childbearing behavior is a useful first step toward filling the gap in research on emotions and demographic behaviors. However, because these types of measures are innovative and unproven in the established literature, special scrutiny into their validity must be performed. I analyze these measures in two ways in order to justify their validity.

First, examining frequency distributions of these measures will provide insights into how respondents interpreted the meaning of the questions about love for a spouse and relationship happiness with a mother-in-law. In research on couples in the United States, Rubin (1970) found that reports of love were positively skewed. In the CVFS among married women ages 15 to 34 at the time of the 1996 interview, the frequency distribution for answers to the survey question "How much do you love your husband? Very much, some, a little, or not at all?" is positively skewed toward more spousal love (only 2% answer "not at all"). Similarly, among married women ages 15 to 34 with a living mother-in-law at the time of the 1996 interview, the frequency distribution for answers to the survey question "In general, would you say that your relationship with your mother-in-law is extremely happy, very happy, somewhat happy, or not happy at all?" is positively skewed toward more relationship happiness (only 7% answer "not happy at all"). This almost universal avoidance of the answer choice expressing the least amount of spousal love/mother-in-law relationship happiness may be the product of social desirability bias, or respondents being reluctant to give a socially inappropriate answer in a face-to-face interview. I interpret these positively skewed distributions as initial evidence that these concepts do have meaning among this study population.

Another approach to demonstrating the construct validity of a measure is to show that the measure is correlated with other variables which reflect the expected characteristics of the measure (Kerlinger 1979). According to this perspective, I examine the correlations between the measure of love and measures which I expect to converge with love. For example, married respondents' reports of spousal love are negatively correlated with having experienced domestic abuse ($r = -0.12$, $p<0.0001$). As another interesting example, married respondents' reports of spousal love are positively correlated with their having ever listened to the radio ($r = 0.05$, $p<0.01$), having ever watched a movie ($r = 0.04$, $p<0.01$), and having ever watched television ($r = 0.03$, $p<0.10$). These findings are sensible because in many settings outside the West exposure to mass media such as radio, movies, and television is likely to promote the diffusion of Western cultural ideas about love and marriage, by romanticizing the nuclear family with its strong conjugal bond (Hornik and McAnany 2001; Barber and Axinn 2004). Finally, I perform a similar analysis with married women ages 15 to 34 with a living mother-in-law. I expect their answers to the question about a happy relationship with their mother-in-law to converge with answers to the same question about a happy relationship with their own mothers, due to a general propensity to get along well with older female mother-figures. Reports of relationship happiness with mothers-in-law and with mothers are indeed correlated ($r = 0.34$, $p<0.0001$). Clearly there remains much progress to be made on the substantial task of developing measures of emotions in close personal relationships for demographic surveys. Nevertheless these analyses serve to strengthen confidence in the operationalization of the concepts of spousal love and a happy relationship with a mother-in-law used in this dissertation.

Table 3.1a. Percentages by whether Mother-in-Law Lives in the Household, for Married Women Age 15-34 with a Living Mother-in-Law in 1996

	Mother-in-Law Lives in the Household (N=384)	Mother-in-Law Does Not Live in the Household (N=576)
Age:		
Wife Age 15-24 in 1996	60%	39% ***
Wife Age 25-34 in 1996	40%	61% ***
Husband Age 15-24 in 1996	28%	12% ***
Husband Age 25-40 in 1996	72%	88% ***
Ethnic Group:		
Upper Caste Hindu	49%	45%
Lower Caste Hindu	9%	14% *
Newar	5%	5%
Hill Tibeto-Burmese	14%	17%
Terai Tibeto-Burmese	22%	16% *
Socioeconomic background:		
Wife went to school before marriage	70%	63% *
Husband went to school before marriage	92%	85% **
Household owns home land plot	96%	79% ***
Childbearing:		
Any children born	78%	88% ***
2 or more children born	58%	72% ***
3 or more children born	29%	46% ***
4 or more children born	10%	21% ***

* p<.05; ** p<.01; *** p<.001 (two-tailed tests)

Table 3.1b. Percentages by whether Mother-in-Law Lives in the Household, for Married Women Age 15-34 in 1996

	Mother-in-Law Lives in the Household (N=384)	Mother-in-Law Is Dead (N=137)
Age:		
Wife Age 15-24 in 1996	60%	25% ***
Wife Age 25-34 in 1996	40%	75% ***
Husband Age 15-24 in 1996	28%	9% ***
Husband Age 25-40 in 1996	72%	91% ***
Ethnic Group:		
Upper Caste Hindu	49%	37% *
Lower Caste Hindu	9%	16% *
Newar	5%	7%
Hill Tibeto-Burmese	14%	15%
Terai Tibeto-Burmese	22%	20%
Socioeconomic background:		
Wife went to school before marriage	70%	51% ***
Husband went to school before marriage	92%	71% ***
Household owns home land plot	96%	76% ***
Childbearing:		
Any children born	78%	90% **
2 or more children born	58%	74% ***
3 or more children born	29%	57% ***
4 or more children born	10%	34% ***

* p<.05; ** p<.01; *** p<.001 (two-tailed tests)

CHAPTER 4

CO-RESIDENCE WITH A MOTHER-IN-LAW AND CHILDBEARING BEHAVIOR

Introduction

In South Asia members of the extended family often play key roles in couples' fertility decisions (Avan and Akhund 2006; Karra, Stark and Wolf 1997). Mothers-in-law are frequently referred to in the literature as an extended family member that particularly influences decisions made by couples or wives about adopting family planning or using contraceptive methods (Clark et al. 2008; Fikree et al. 2001; Kadir et al. 2003; Wilson-Williams et al. 2008). The aim of this chapter is to improve understanding about how mothers-in-law affect subsequent childbearing behavior by examining one specific mother-in-law dynamic – household co-residence.

Implications of changing family structure for fertility behavior have been the subject of many theories of demographic transition (Caldwell 1982; Davis 1955; Goode 1964). These theories were constructed to apply to non-Western settings that historically had patriarchal family systems characterized by extended family households and extensive parental authority over marriages, fertility, and contraceptive use. Social demographers have hypothesized different powerful and mutually reinforcing mechanisms through which family structure could affect childbearing behavior. Despite the theoretical importance of family structure for childbearing behavior, social

demographers have struggled to provide strong empirical tests of this idea in such settings. Rural Nepal is an excellent setting to examine the relationship between family structure and fertility behavior because the population in this study area represents the onset of a transition to independent living arrangements (see Chapter 2) and has recently begun a transition to widespread use of contraception (Axinn and Yabiku 2001).

Researchers have produced only some empirical evidence of the role of living with mothers-in-law in couples' childbearing behavior in non-Western settings. A study in Taiwan showed that extended family living after marriage was positively related to both desired and actual fertility and negatively related to contraceptive use (Caldwell, Reddy and Caldwell 1982; Freedman, Chang and Sun 1982). Research in Bangladesh has found lower contraceptive prevalence among women residing in husbands' extended families (Caldwell, Immerwahr and Ruzicka 1982; Sikder 2000). A study in India found that the absence of a mother-in-law from the household increased the demand for contraceptive methods (Jain et al. 1992). Finally, a study in Jordan found residence with in-laws to be associated with increased risk of "interference" with efforts to avoid pregnancy (Clark et al. 2008). Because these studies are limited to cross-sectional data, making causal inferences is impossible because it is unknown whether co-residence preceded the childbearing behaviors of interest.

In this chapter I expand the current literature in two ways. First, I employ a prospective study design, a fundamental methodological advance over previous studies using cross-sectional data. Longitudinal follow-up with monthly measures of pregnancy and contraceptive use are linked to baseline measures of mother-in-law co-residence, enhancing the ability to make causal inferences about the impact of a co-resident mother-

in-law on the pace of subsequent childbearing behavior. Second, I estimate the effects of mother-in-law co-residence on both the beginning and end of childbearing. I treat two aspects of childbearing behavior, pregnancy and permanent contraceptive use, as dependent variables. I document how a co-resident mother-in-law is positively associated with pregnancy and negatively associated with permanent contraceptive use.

Theoretical Framework

Theorists have argued that the extended family system encourages high fertility through a variety of possible mechanisms. In this section I detail four specific mechanisms which explicitly link co-residence with a mother-in-law to high fertility or low contraceptive use. I describe the mother-in-law's motivation, the daughter-in-law's motivation, the costs of childbearing, and the structure of social networks each as potential mechanisms linking mother-in-law co-residence and childbearing outcomes.

Mother-in-Law's Motivation within the Extended Family. Under the extended family system the household is ideally structured by three generations living with or in close proximity to each other, with newly married couples becoming absorbed into the existing household (Caldwell 1982; Goode 1964). Socialization processes within this type of family structure are likely to reinforce high fertility. Research in the United States has stressed the importance of parents' preferences, attitudes, and values for their children's childbearing decisions (Barber 2000). There is good reason to expect that parents, on average, hold values characteristic of society in the past (Caldwell 1982; Waite, Goldscheider and Witsberger 1986). In the setting of Nepal, one of these values is likely to be an emphasis on family continuity via high fertility.

Early fertility theorists have argued that historically in settings such as Nepal the older generation has valued high fertility because they enjoy advantages gained from the younger generations (Caldwell 1982). Beginning at early ages children contribute to household production through a variety of household activities, such as housework or farming (Cain 1977; Caldwell 1982). Under the extended family system elders retain control of children's economic output and therefore benefit from their productivity. Previous research suggests that the older generation in this setting has historically had little incentive for their children and children-in-law to restrict childbearing (Axinn 1992; Fricke 1986), perhaps because a continuous supply of children is important for providing security in old age.

Through socialization a mother-in-law might encourage a wife to hold similar historical values. This socialization process is likely to be even more effective when the mother-in-law lives in the same household. Neo-local residence, or the couple living separately from parents, may alter family formation attitudes and preferences (Axinn and Barber 1997). A couple living separately from parents may be exposed to new ideas about fertility limitation, increasing their likelihood of using contraception. This living situation may also give a wife or couple more freedom to stray from a mother-in-law's expectations of high fertility and to use contraceptives.

Daughter-in-Law's Motivation within the Extended Family. Another related mechanism for high fertility and low contraceptive use within the extended family is that wives may use their fertility to attain status in the husband's family. Mothers-in-law in Nepal are portrayed as having authority over young wives' lives (Bennett 1983; Folmar 1992; Gray 1990; Stash 1999). Producing children, especially sons, can be one of the

main sources of status for the wife. Therefore a wife may be less likely to use contraceptives if she is motivated to bear children to improve her position in the extended family household. Neo-local residence, or the husband and wife residing separately from both natal households, may erode the authority of the older generation (Caldwell 1982). This living situation may reduce the need for childbearing as a means to attain household status and thus increase contraceptive use.

Costs of Childbearing within the Extended Family. A third reason why extended family living may increase fertility or decrease the likelihood of contraceptive use is that in this type of family structure the costs of childbearing are shared by members of the extended family. For example, a study in China found that having co-resident grandparents reduces the time mothers devote to childcare (Chen, Short and Entwisle 2000). Thus living away from parents may also make it more difficult to meet childcare requirements, reducing the demand for children and thereby increasing contraceptive use.

Social Networks within the Extended Family. Demographers have increasingly taken into account theories regarding the structure of social networks in order to explain fertility transitions in developing countries (Bongaarts and Watkins 1996; Entwisle et al. 1996; Godley 2001; Kohler 1997; Kohler, Behrman and Watkins 2001; Montgomery and Casterline 1996). These theories emphasize two different mechanisms through which social networks could influence contraceptive use: social learning, that learning about contraception by interacting with other women who have used it will encourage a woman to use contraceptives herself, and social influence, that the normative fertility and contraceptive preferences and behaviors prevailing in a woman's network will influence her fertility and contraceptive behavior (Kohler et al. 2001). An extended family

household with a co-resident mother-in-law may involve a denser network all sharing similar values of high fertility and fewer actual users of contraceptives. In this family type, a wife's behavior may be strongly influenced by the ideology in the household. Moreover a wife may be less likely to acquire information about contraceptives because she is less likely to interact with somebody else who has used them.

Based on many of these theoretical ideas, I expect mother-in-law co-residence to increase fertility and decrease the likelihood of contraceptive use. Finally, a co-resident mother-in-law may have different effects on the couples' childbearing behavior depending on the number or gender of children already born. In-laws have been found to put pressure on a wife to conceive shortly after marriage (Wilson-Williams et al. 2008). A study in Taiwan found that living with the husband's parents at the time of marriage shortened the duration of spacing between the first and second births, but not between the second and third births (Chi and Hsin 1996). Similarly in Nepal, a co-resident mother-in-law is likely to have stronger influence in the early stages of a wife's childbearing, when a wife may be still trying to prove her fertility and establish her position in the household.

Measures and Analytic Strategy

The sample, measures, and model estimation techniques that I use in this particular analytic chapter are described below. The data used in this chapter are described in detail in Chapter 3.

Analysis Sample. The sample for these analyses includes 470 married women between the ages of 15 and 34 in 1996, whose mother-in-law is alive at the time of the 1996 interview. Respondents who are sterilized or whose spouse is sterilized before the start of the hazard models are excluded from the sample. Finally, the influence of a co-

resident mother-in-law on childbearing behavior may depend on the number of children already born. Hence in models of pregnancy the sample is stratified into groups of women with no children born, 1 child born, and 2 children born. In models of contraceptive use, women with no children born are restricted from the sample because I consider women to be at risk of using contraception after the birth of their first child.

Measures of Pregnancy and Contraceptive Use. The dependent variables in this chapter capture behaviors indicating the beginning and ending of childbearing. These measures come from the prospective monthly panel data and are analyzed in a hazard model framework. I analyze these prospective measures of respondents' contraceptive use for a total of 108 months, from February 1997 through January 2006.

The process of childbearing starts with pregnancy; therefore instead of using the timing of birth as a dependent variable I use the timing of pregnancy. During each month in the prospective panel data before the respondent becomes pregnant the dependent variable is coded 0, and during the month when she becomes pregnant it is coded 1. Once a pregnancy occurs the respondent is censored from the analysis. Among women in this sample with no children ever born at the start of the hazard, 75% report a pregnancy at some time during the 108 months of panel data. Among women with 1 child born at the start of the hazard 69% report a pregnancy, and among women with 2 children born at the start of the hazard 39% report a pregnancy.

Sterilization marks the end of the process of childbearing. Although a variety of contraceptive methods have become available in Nepal, residents in this setting have demonstrated a strong preference for permanent contraceptive methods. Because sterilizations account for the majority of births averted in Nepal, I examine the influence

of mother-in-law co-residence on sterilization. I code a time-varying dichotomous variable 1 the first time a wife or her husband becomes sterilized. This is used to estimate the hazard of sterilization. Among women in this sample who have had at least one child, 40% report that either she or her husband has been sterilized during the 108 months of panel data. Furthermore, in Nepal Depo-Provera (a contraceptive method which could be used to space births) is commonly used among women who say that they do not want any more children (Axinn 1992). Therefore I also examine the influence of mother-in-law co-residence on first use of Depo-Provera because this behavior can be considered an alternative means of ending childbearing. Among women in this sample who have had at least one child, 36% report using Depo-Provera during the study period (of course, some women who use Depo-Provera can become sterilized later).

Measures of Mother-in-Law Co-Residence. In this chapter the main independent variable is co-residence with a mother-in-law. I test three variations of measures of co-residence: whether the woman's mother-in-law lives in the household in 1996, whether the woman had ever lived with in-laws by 1996, and an ordinal measure of co-residence coded 0 to 2. The measure of whether the woman's mother-in-law lives in the household is a dichotomous variable derived from the household relationship grid. It is coded 1 if the respondent's mother-in-law was defined as a resident of the respondent's household in 1996 (a resident of a household is defined as having eaten or slept in the household for at least three of the past six months at the time of the study). I also test a measure of whether the respondent had ever lived with in-laws by 1996, which comes from the life history calendars. However, this measure is not specific to the mother-in-law. Finally, I construct an ordinal measure of co-residence which combines the measures of current and

past co-residence. I code this variable 0 if the woman had never lived with in-laws by 1996, 1 if she had ever lived with in-laws but was not living in the same household as her mother-in-law in 1996, and 2 if she was living in the same household as her mother-in-law in 1996. The means and standard deviations of these variables as well as controls included in the models are presented in Table 4.1.

(*Table 4.1, about here*)

Controls for Models of Pregnancy and Contraceptive Use. In order to properly specify the models I control for various other respondent characteristics that may be confounders between mother-in-law co-residence and the dependent variables of interest – pregnancy and permanent contraceptive use. I expect experiences with previous childbearing to have consequences for these outcomes. To capture these possible consequences, I control for previous childbearing with a measure of number of children ever born, with the expectation that the presence of more children will increase contraceptive use by creating greater need.

I use measures of education and household wealth as socioeconomic controls. I control for whether the wife attended school before marriage and whether the husband attended school before marriage because among socioeconomic measures, education has consistently been shown to strongly affect reproductive behavior (Axinn 1993; Axinn and Barber 2001; Caldwell 1982). Because much of the Nepalese economy is not monetized, I use a measure of wealth focusing on house plot ownership. I consider this an indicator of wealth because it can be a source of long-term wealth; ownership of a house plot gives residents the opportunity to grow fruits and vegetables for home use and to conduct businesses (such as a small store) that would otherwise require rental property. I measure

house plot ownership with a dichotomous variable coded 1 if the household owns the land on which the couple's home is built and 0 otherwise.

I control for both wives' and their husbands' ages because contraceptive use has increased dramatically over time (Axinn and Barber 2001). For each spouse I include a dichotomous indicator of being in the younger age group (age 15 to 24 at the baseline survey). The older age group is the reference category (wives age 25 to 34 and husbands age 25 to 40 at baseline).[1]

I control for ethnic group, which in Nepal is related to religion. For this measure I assume that the wife's reported ethnic group represents the couple's ethnic group, because 98 percent of husbands reported the same ethnicity as their wives. I use five dichotomous indicators of ethnicity (Upper Caste Hindu, Lower Caste Hindu, Newar, Hill Tibeto-Burmese, and Terai Tibeto-Burmese) because of these groups' diverse propensities to use contraceptives (Axinn and Barber 2001). Upper Caste Hindu status is the omitted category; effects of belonging to the other ethnic groups are relative to this group.

Finally, I control for duration since the baseline interview with a counter variable, measuring years precise to the month, and the counter variable squared.

Analytic Strategy. I use event-history methods to model the risk of becoming pregnant/adopting permanent contraception over time. Both continuous time and discrete time event-history methods have been used effectively in studies of the determinants of family transition processes (Allison 1984; Bumpass and Sweet 1989; Clarkberg 1999;

[1] I also examined the impact of the wife's degree of participation in selecting her husband. This effect was not statistically significant, and I do not include it in the models. It may be that the wife's report of "participation" in spouse selection actually indicates very little influence over the choice of a spouse such that it does not reach the threshold I predict would have consequences for contraceptive use.

Oppenheimer, Kalmijn and Lim 1997; South 1996; South and Crowder 1999; Teachman 1983; Thornton, Axinn and Teachman 1995). Previous research using the CVFS has also successfully used these techniques (Axinn and Barber 2001; Axinn and Yabiku 2001; Ghimire et al. 2006; Yabiku 2004, 2005). Essentially, discrete-time estimation of the hazard model approximates the results of continuous-time estimation of the hazard model (Allison 1982, 1984; Peterson 1986, 1991). Whereas continuous-time techniques examine the hazard rate simultaneously across the entire time period under study, the discrete-time approach breaks the study time into small intervals and examines the process of transition during each of these discrete periods (Allison 1982; Peterson 1986, 1991). When large time units are used and the outcome event is relatively common, discrete-time methods can suffer from significant time aggregation bias (Peterson 1991). As a result, use of the smallest possible time unit is advantageous in the discrete-time approach. Fortunately the events of interest are measured monthly in the panel data collection; this allows me to study discrete time periods of one month by using the person-month of exposure as the unit of analysis. Because of the sparseness of events (i.e. the probability of getting sterilized is so small for a respondent within each one-month period) estimates from these models are virtually as precise as those that would be obtained using comparable continuous time models (Peterson 1991; Yamaguchi 1991). Therefore I conceptualize the transition to using contraception in discrete time rather than in continuous time.

Furthermore, when the transition has only one possible ending state, logistic regression is an appropriate estimation technique for discrete-time hazard models (Allison 1982; Ben-Akiva and Lerman 1987; Guilkey and Rindfuss 1987; Kmenta 1986; Maddala 1983; Peterson 1991). First sterilization is an example of this type of transition.

Therefore I use logistic regression to estimate discrete-time hazard models. Coefficients in a logit model give the change in the log-odds of sterilization for a unit change in the explanatory variables. To facilitate interpretation of the coefficients, I report the exponentiated log-odds coefficients, or the odds ratios, which are interpreted as the amount by which the monthly odds of sterilization are multiplied for a unit change in the explanatory variable. Odds ratios equal to 1 represent no effect, odds ratios greater than 1 represent positive effects, and odds ratios less than 1 represent negative effects.

Finally, because these data are hierarchically clustered with several individuals living in the same neighborhood, I use a multilevel discrete-time hazard model. Estimates are calculated using the GLIMMIX macro for SAS according to the approach described by Barber et al. 2000.

Common Issues in Modeling the Transition to Sterilization. Two issues commonly arise when analyzing any type of family formation transition, including this analysis of transition to sterilization. First, at any point during the duration of the analysis period, some respondents who will eventually get sterilized have not yet done so. Thus for those respondents who never get sterilized during the 108 month period analyzed here but who do get sterilized after this period, their transition experience will not be observed. This problem, referred to as "right censoring," will be addressed by the use of event-history models. This approach was designed explicitly to address the problem of right censoring in models of transitions that occur over time when some cases have not yet completed the transition of interest (Yamaguchi 1991).

A second issue is that whenever the analysis period begins, some respondents will have already made the transition to being sterilized. Thus for those respondents who were

already sterilized, their transition experience will not be observed. This problem, referred to as "left censoring," will be addressed by defining the analysis sample and research question to match the population "at risk" of experiencing the transition during the observation period. Specifically in this case the population I consider to be "at risk" is married women between the ages of 15 and 34 who are not sterilized and whose husbands are not sterilized at the start of the period of analysis. In addition, I will examine results for sensitivity to changes in the level of left censoring. I will re-estimate models of husband or wife sterilization separately among those ages 15-24 and those ages 25-34. Because the level of left censoring is much higher for sterilization among those ages 25-34 than among those ages 15-24, comparison of results from models with these two age groups will indicate the sensitivity of results to different levels of left censoring. If these two age groups produce similar model results, I will conclude results are not sensitive to left censoring. If these two age groups produce very different model results, I will conclude results are sensitive to left censoring.

Additionally, I propose to deal with the problem of left censoring by examining the cases that were left censored to determine the selectivity of respondents in the analysis sample. That is, I will compare measures of factors known to predict sterilization for both censored and uncensored cases, to explore the extent to which the women in the sample differ from the women who were excluded from the sample due to having already gotten sterilized. Exploiting these measures will enable me to evaluate the potential influence of selection bias on the results. For example, it is known that among women ages 25-34 at the start of the period of analysis who had already had at least one child, 35% had already used contraception to terminate their childbearing by age 25. If these

women who would be censored cases are substantially different on measures of factors known to predict permanent contraception, I will conclude that results may be sensitive to bias from left censoring. However if these censored cases are not different from the analysis sample, I will conclude that results are not biased from left censoring.

Results

Results of multivariate models of pregnancy and permanent contraception are presented in Tables 4.2 through 4.4. Table 4.2 examines the influence of mother-in-law co-residence on the odds of pregnancy among women with no children, one child, and two children. Tables 4.3 and 4.4 examine the influence of mother-in-law co-residence on the odds of ending childbearing through use of Depo-Provera (Table 4.3) or sterilization (Table 4.4) among women with one or more children born.

Pregnancy. In Table 4.2 I present the effects of multiple measures of co-residence on the odds of pregnancy. Among women with no children born, Models 1 and 2 show that living in the same household with a mother-in-law in 1996 and having ever lived with in-laws by 1996 each comparably influences the odds of pregnancy. Living in the same household with a mother-in-law increases the monthly odds of becoming pregnant by 75%, whereas having ever lived with in-laws increases the monthly odds of becoming pregnant by 80%. Model 3 shows that the effect of the ordinal measure of co-residence is significant but not as large as that of the dichotomous measures. Each unit increase in the ordinal measure (i.e. from never lived with in-laws to ever lived with in-laws or from ever lived with in-laws to lives in the same household with a mother-in-law) increases the monthly odds of becoming pregnant by 39%.

(*Table 4.2, about here*)

The same three models are now run for women with one child born and women with two children born. The models reveal no evidence to suggest that co-residence significantly affects the likelihood of pregnancy for either group of women.[2] Thus overall these findings show strong support for the hypothesis that co-residence increases the pace into pregnancy, but only among women with no children.

Permanent Contraception. I present Tables 4.3 and 4.4 to demonstrate whether mother-in-law co-residence plays a role in the ending of couples' childbearing behavior as well as the beginning. Table 4.3 shows estimates of the effects of the same three measures of co-residence on the odds of using Depo-Provera and Table 4.4 shows estimates of the effects of the same three measures of co-residence on the odds of sterilization, both among women who have borne at least one child.[3] Model 1 in Table 4.3 shows that living in the same household with a mother-in-law in 1996 decreases the subsequent monthly odds of adopting Depo-Provera by 27%. Model 2 shows that the effect of having ever lived with in-laws is insignificant, and Model 3 shows that the effect of the ordinal measure of co-residence is in the negative direction but not as strong of a predictor. None of the measures of co-residence significantly affect the likelihood of a wife or her husband getting sterilized, as shown in Table 4.4.

(*Table 4.3, about here*)

[2] I also estimated models of the effect of mother-in-law co-residence in 1996 on the total number of children born between 1996 and 2008. I estimated this model for women with no children born in 1996 and for women who had already born children by 1996, and found that the effects of co-residence were not statistically significant for either sample.

[3] I also tried limiting the sample to women who have borne one or more sons, or women who have borne one or more daughters. This did not alter the results. However, when the sample is limited to women who have borne two or more children, the effect of living in the same household with a mother-in-law in 1996 becomes stronger.

The most prominent finding to emerge from these analyses is that mother-in-law co-residence has the strongest effect on wives' first pregnancy. This may be because a wife is motivated to quickly bear children after marriage in order to improve her status with her husband's family. Living in the husband's extended family household may intensify this pressure to attain status. Once a new wife has proven her fertility the pressure from her in-laws to continue to prove herself may be lifted. Or, these effects may be the product of a co-resident mother-in-law's capacity to socialize her daughter-in-law to value high fertility. These effects may also result from a wife having less interaction with peers who are limiting their fertility when she lives in her mother-in-law's household, or they may result from other intervening mechanisms. Whatever the cause, these results are consistent with the conclusion that co-residence with a mother-in-law significantly impacts subsequent childbearing behavior.

(*Table 4.4, about here*)

I also examined the effect of co-residence on the odds of condom use (analysis not shown). The effect of living in the same household as a mother-in-law is large and significant (odds ratio 2.37, t-ratio 3.32). This may be because a co-resident mother-in-law is associated with higher household economic status, in which case the couple may have money for or better access to condoms. Or it may be because a co-resident mother-in-law is associated with both husband and wife education, which have been found to increase couple's condom use in Nepal (Gubhaju 2009). This large effect may also be the product of a co-resident mother-in-law as potentially a valuable resource for a wife's maternal health (Varghese 2009). It has been suggested that the mother-in-law could be a valuable resource to a daughter-in-law because she has more knowledge and experience

in pregnancy related matters, and that women could consult their mothers-in-law before beginning contraception. In fact one study found that wives whose mother-in-law reported discussing family planning with them were more than twice as likely to use contraceptives as other women (Fikree et al. 2001). A wife consulting a mother-in-law about contraceptive methods may be facilitated by the two of them living in the same household. Therefore a co-resident mother-in-law may encourage temporary spacing methods like condoms to protect the wife's maternal health and ensure safe healthy delivery of grandchildren. Various intervening mechanisms are likely at work, but exploring the full range of possible intervening mechanisms is beyond the scope of the present study.

Left Censoring Sensitivity Analyses. The problem of "left censoring" may have occurred in this analysis because respondents who were already sterilized before the start of the study period were not observed. In order to consider the sensitivity of results to levels of left censoring I perform two analyses. First, in Table 4.5, I present the effects of mother-in-law co-residence on the odds of sterilization with models estimated separately among women ages 15 to 24 and women ages 25 to 34. The level of left censoring is much higher for sterilization among those ages 25 to 34 than among those ages 15 to 24, as the older group has had more time to complete their childbearing. However, a comparison of regression models with these two age groups shows that they produce similar model results. When tested formally in a pooled model, the interaction between age and any measure of co-residence is not significant. This indicates that results are not sensitive to this level of left censoring by age.

(*Table 4.5, about here*)

Next, in Table 4.6, I examine the cases that were left censored to determine the selectivity of respondents in the analysis sample. Recall that cases where either the wife or her husband was sterilized at the start of the study period were censored from the analysis sample. Descriptive statistics for these 229 cases are presented in the first column. The same statistics for the analysis sample are presented in the second column, to explore the extent to which the women in the analysis sample differ from women who were censored from the sample due to having already gotten sterilized (the censored cases fit the same other criteria as those cases included in the analysis sample: they are married women ages 15 to 34 in 1996, with a living mother-in-law, who have borne at least one child). The pattern of age differences is not surprising: older couples are more likely to be censored from the analysis due to already being sterilized at the start of the study. The previous exercise in Table 4.5 indicates that this censoring by age does not bias results. The differences shown in the extent of childbearing are also to be expected. Women who had already borne two, three, or four or more children are more likely to be sterilized and thus censored from the analysis. The bottom of Table 4.6 indicates that results may be sensitive to bias from left censoring due to ethnic group and socioeconomic background. The censored cases are more likely to be Upper Caste Hindu and less likely to be Newar. Because ethnic groups in this setting have different propensities to use contraception, the selection of certain ethnic groups into the analysis sample could introduce some bias into the results. The censored cases also come from slightly less educated backgrounds. However, these differences are not substantial; thus the potential for these levels of left censoring to bias results is minimal.

(*Table 4.6, about here*)

Discussion

This chapter highlights the important independent role played by extended family structure in childbearing behavior. In this chapter I exploit monthly panel data to conduct an event-history analysis. This longitudinal design is a fundamental methodological advance that helps to provide new insights into the causal nature of the relationship between co-residence with a mother-in-law and childbearing behavior. The measures of co-residence used in this analysis come before measures of respondents' pregnancies and permanent contraceptive use, and yet exert significant influence on these outcomes. Results for pregnancy are consistent with the prediction that the experience of living with a mother-in-law increases subsequent pregnancy, even when controlling for other factors known to predict childbearing; however these results are only pronounced among women who have not yet had children. Results for permanent contraceptive use are mixed. Although I find a negative influence of co-residence on the use of Depo-Provera, I find no effect of co-residence on the likelihood of a women or her husband getting sterilized.

In addition to theoretical insights, the strong independent influence of mother-in-law co-residence demonstrated here has important policy implications. In the South Asian region, high fertility persists despite longstanding goals of postponing childbearing and reducing total fertility in order to ease overpopulation and poverty. A growing literature suggests that the neglect of husbands' roles in contraceptive behavior could perhaps be limiting the success of family planning programs (Mahmood and Ringheim 1997; Sharan and Valente 2002). In the area examined in this research, the Chitwan Valley of Nepal, the vast majority of married women experience patrilocal residence, moving into their husbands' parents' household after marriage. Therefore in addition to integrating

husbands into family planning programs, it appears that integrating mothers-in-law may be a useful policy tool. These findings suggest that programs may be more effective in reducing fertility if they provide mothers-in-law with family planning information and bring them into the discussion, especially if they are living in the same household.

Despite theoretical emphasis on the centrality of the affinal family to childbearing behavior in Nepal, empirical social science testing these hypotheses has been a neglected area of research. This chapter improves understanding of demographic processes in this setting by conceptualizing the affinal domestic sphere as an important social unit in which family formation occurs. The impacts observed on pregnancy and contraceptive use suggest that investigation of other consequences of family structure will be fruitful avenues for future research. In addition to childbearing behaviors, family structure may affect subjective aspects of childbearing, such as ideal family size or sex preference. Furthermore, this research focused on co-residence with mothers-in-law. This calls for further understanding of the inner workings of affinal family households, such as whether they contain fathers-in-law or other siblings, and the mechanisms producing their effects on childbearing behavior. Finally, most people in this study setting think that co-residence with parents/in-laws will decrease over the next 20 years (see Chapter 2). If true, then this setting will provide an ideal opportunity to continue to investigate the effects of variation in family structure on variation in childbearing behavior.

Table 4.1. Means and Standard Deviations of Variables Used in the Analyses (N=470)

	Mean	Standard Deviation	Minimum	Maximum
Independent Variables				
Mother-in-Law Lives in the Household	0.46	0.50	0	1
Ever Lived with In-Laws	0.86	0.35	0	1
Ordinal Co-Residence Measure	1.32	0.71	0	2
Control Variables				
Number of Children Born	2.35	1.27	1	7
Socioeconomic background:				
Wife Went to School Before Marriage	0.62	0.49	0	1
Husband Went to School Before Marriage	0.89	0.31	0	1
Household Owns Home Land Plot	0.84	0.37	0	1
Age:				
Wife Age 15-24 in 1996	0.48	0.50	0	1
Wife Age 25-34 in 1996	0.52	0.50	0	1
Husband Age 15-24 in 1996	0.17	0.38	0	1
Husband Age 25-40 in 1996	0.83	0.38	0	1
Ethnic Group:				
Upper Caste Hindu	0.43	0.50	0	1
Lower Caste Hindu	0.11	0.32	0	1
Newar	0.07	0.25	0	1
Hill Tibeto-Burmese	0.16	0.37	0	1
Terai Tibeto-Burmese	0.23	0.42	0	1

Note: Measures are from the start of the study period.

Table 4.2. Logistic Regression Estimates of the Effects of Co-Residence on the Odds of Pregnancy, by Number of Children Born

	Women with No Children Born (N=99)			Women with 1 Child Born (N=119)			Women with 2 Children Born (N=157)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Independent Variables									
Mother-in-Law Lives in the Household	1.75**			0.94			1.13		
	(2.48)			(-0.29)			(0.64)		
Ever Lived with In-Laws		1.80**			1.20			1.18	
		(2.71)			(0.78)			(0.64)	
Ordinal Co-Residence Measure (0-2)			1.39**			1.00			1.13
			(2.90)			(-0.03)			(0.91)
Control Variables									
Socioeconomic background:									
Wife went to school before marriage	0.77	0.53†	0.57†	0.80	0.78	0.80	0.91	0.91	0.90
	(-0.53)	(-1.46)	(-1.29)	(-0.81)	(-0.92)	(-0.81)	(-0.39)	(-0.42)	(-0.45)
Husband went to school before marriage	1.10	1.03	0.94	1.06	1.05	1.06	0.92	0.92	0.92
	(0.21)	(0.07)	(-0.15)	(0.20)	(0.16)	(0.18)	(-0.30)	(-0.31)	(-0.29)
Household Owns Home Land Plot	1.22	1.58†	1.34	0.96	0.87	0.93	1.18	1.22	1.17
	(0.54)	(1.55)	(0.94)	(-0.12)	(-0.47)	(-0.23)	(0.58)	(0.72)	(0.56)
Age: [a]									
Wife Age 15-24 in 1996	1.68†	1.60†	1.68†	3.14***	3.06***	3.11***	2.07***	2.14***	2.10***
	(1.44)	(1.47)	(1.58)	(3.51)	(3.46)	(3.49)	(3.10)	(3.24)	(3.17)

Husband Age 15-24 in 1996	1.90**	1.94***	1.90***	1.14	1.13	1.13	0.73†	0.74†	0.72†
	(2.89)	(3.36)	(3.21)	(0.67)	(0.64)	(0.65)	(-1.42)	(-1.39)	(-1.47)
Ethnic Group: [b]									
Lower Caste Hindu	0.49*	0.47**	0.48**	1.03	0.99	1.03	1.36	1.34	1.38
	(-2.22)	(-2.70)	(-2.57)	(0.10)	(-0.04)	(0.08)	(0.84)	(0.81)	(0.87)
Newar	0.75	0.64	0.72	1.12	1.15	1.12	1.12	1.11	1.13
	(-0.51)	(-0.87)	(-0.62)	(0.27)	(0.32)	(0.27)	(0.25)	(0.24)	(0.26)
Hill Tibeto-Burmese	0.46**	0.49***	0.48***	0.98	0.97	0.98	1.03	1.03	1.03
	(-3.05)	(-3.22)	(-3.24)	(-0.08)	(-0.13)	(-0.08)	(0.09)	(0.10)	(0.10)
Terai Tibeto-Burmese	0.79	0.72	0.75	1.28	1.24	1.28	2.99***	2.92***	2.98***
	(-0.63)	(-0.99)	(-0.88)	(0.87)	(0.77)	(0.88)	(3.41)	(3.35)	(3.41)
Duration [c]	1.32†	1.21	1.24	1.22†	1.21†	1.21†	0.93	0.93	0.94
	(1.55)	(1.16)	(1.26)	(1.43)	(1.38)	(1.42)	(-0.55)	(-0.54)	(-0.50)
$(Duration)^2$	0.88***	0.89***	0.88***	0.95**	0.95**	0.95**	0.99	0.99	0.99
	(-3.32)	(-3.31)	(-3.30)	(-2.55)	(-2.50)	(-2.54)	(-0.52)	(-0.52)	(-0.55)
Person-months	3,099	3,099	3,099	7,399	7,399	7,399	13,209	13,209	13,209
-2 Log-Likelihood	20,604	20,033	20,242	50,548	50,541	50,541	99,222	99,251	99,244

Note: Numbers in parentheses are t-ratios

†p<.10; *p<.05; **p<.01; ***p<.001 (one-tailed tests)

[a] Reference Group is age 25-34 in 1996 for wives, and 25-40 in 1996 for husbands

[b] Reference Group is Upper Caste Hindu

[c] Duration is measured in years since baseline interview precise to the month

Table 4.3. Logistic Regression Estimates of the Effects of Co-Residence on the Odds of Depo-Provera Use (N=470)

	Model 1	Model 2	Model 3
Independent Variables			
Mother-in-Law Lives in the Household	0.73*		
	(-1.79)		
Ever Lived with In-Laws		0.90	
		(-0.47)	
Ordinal Co-Residence Measure (0-2)			0.84†
			(-1.45)
Control Variables			
Number of Children Born	1.14*	1.16*	1.15*
	(1.94)	(2.16)	(2.09)
Socioeconomic background:			
Wife went to school before marriage	1.09	1.07	1.08
	(0.43)	(0.34)	(0.40)
Husband went to school before marriage	0.92	0.94	0.95
	(-0.32)	(-0.22)	(-0.22)
Household Owns Home Land Plot	1.00	0.86	0.94
	(-0.01)	(-0.75)	(-0.29)
Age: [a]			
Wife Age 15-24 in 1996	1.11	1.09	1.10
	(0.54)	(0.43)	(0.48)
Husband Age 15-24 in 1996	1.35	1.27	1.31
	(1.26)	(1.04)	(1.15)
Ethnic Group: [b]			
Lower Caste Hindu	2.57***	2.55***	2.58***
	(3.30)	(3.31)	(3.33)
Newar	1.97*	1.87*	1.90*
	(1.82)	(1.71)	(1.74)
Hill Tibeto-Burmese	2.16**	2.15**	2.12**
	(2.94)	(2.94)	(2.86)
Terai Tibeto-Burmese	0.77	0.80	0.78
	(-0.94)	(-0.80)	(-0.87)
Duration [c]	0.78**	0.77**	0.78**
	(-2.47)	(-2.53)	(-2.49)
$(\text{Duration})^2$	1.01	1.01	1.01
	(0.39)	(0.42)	(0.41)
Person-months	24,227	24,227	24,227
-2 Log-Likelihood	191,904	191,557	191,743

Note: Numbers in parentheses are t-ratios

†p<.10; *p<.05; **p<.01; ***p<.001 (one-tailed tests)

[a] Reference Group is age 25-34 in 1996 for wives, and 25-40 in 1996 for husbands

[b] Reference Group is Upper Caste Hindu

[c] Duration is measured in years since baseline interview precise to the month

Table 4.4. Logistic Regression Estimates of the Effects of Co-Residence on the Odds of Husband or Wife Sterilization (N=467)

	Model 1	Model 2	Model 3
Independent Variables			
Mother-in-Law Lives in the Household	0.88		
	(-0.82)		
Ever Lived with In-Laws		0.78	
		(-1.15)	
Ordinal Co-Residence Measure (0-2)			0.88
			(-1.14)
Control Variables			
Number of Children Born	0.98	0.99	0.98
	(-0.31)	(-0.11)	(-0.26)
Socioeconomic background:			
Wife went to school before marriage	0.89	0.90	0.89
	(-0.63)	(-0.60)	(-0.61)
Husband went to school before marriage	0.87	0.89	0.88
	(-0.58)	(-0.45)	(-0.52)
Household Owns Home Land Plot	0.95	0.91	0.95
	(-0.25)	(-0.47)	(-0.23)
Age: [a]			
Wife Age 15-24 in 1996	1.66**	1.67**	1.67**
	(2.79)	(2.80)	(2.81)
Husband Age 15-24 in 1996	0.89	0.86	0.88
	(-0.57)	(-0.71)	(-0.59)
Ethnic Group: [b]			
Lower Caste Hindu	0.62*	0.61*	0.61*
	(-1.68)	(-1.70)	(-1.72)
Newar	1.31	1.29	1.30
	(0.88)	(0.81)	(0.83)
Hill Tibeto-Burmese	0.57*	0.56*	0.56*
	(-2.12)	(-2.17)	(-2.17)
Terai Tibeto-Burmese	0.89	0.91	0.89
	(-0.50)	(-0.41)	(-0.49)
Duration [c]	1.24*	1.24*	1.24*
	(2.05)	(2.08)	(2.07)
$(\text{Duration})^2$	0.97**	0.97**	0.97**
	(-2.58)	(-2.60)	(-2.59)
Person-months	34,098	34,098	34,098
-2 Log-Likelihood	272,874	272,692	272,784

Note: Numbers in parentheses are t-ratios

†p<.10; *p<.05; **p<.01; ***p<.001 (one-tailed tests)

[a] Reference Group is age 25-34 in 1996 for wives, and 25-40 in 1996 for husbands

[b] Reference Group is Upper Caste Hindu

[c] Duration is measured in years since baseline interview precise to the month

Table 4.5. Logistic Regression Estimates of the Effects of Co-Residence on the Odds of Husband or Wife Sterilization, by Wives' Cohort

	Wives Age 15-24 (N=223)			Wives Age 25-34 (N=244)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Independent Variables						
Mother-in-Law Lives in the Household	0.81			0.83		
	(-1.00)			(-0.68)		
Ever Lived with In-Laws		0.63†			0.50*	
		(-1.61)			(-1.73)	
Ordinal Co-Residence Measure (0-2)			0.80†			0.76†
			(-1.49)			(-1.30)
Control Variables						
Number of Children Born	1.07	1.10	1.08	0.87†	0.87†	0.87†
	(0.63)	(0.91)	(0.70)	(-1.43)	(-1.34)	(-1.45)
Socioeconomic background:						
Wife went to school before marriage	0.70†	0.69†	0.69†	1.42	1.68*	1.52†
	(-1.38)	(-1.48)	(-1.44)	(1.24)	(1.76)	(1.46)
Husband went to school before marriage	0.87	0.96	0.90	0.53*	0.49*	0.52*
	(-0.35)	(-0.11)	(-0.28)	(-1.89)	(-2.08)	(-1.94)
Household Owns Home Land Plot	1.25	1.20	1.29	0.66	0.64	0.68
	(0.72)	(0.63)	(0.84)	(-1.15)	(-1.25)	(-1.07)
Ethnic Group: [b]						
Lower Caste Hindu	0.54†	0.52*	0.52*	0.60	0.56	0.60
	(-1.56)	(-1.66)	(-1.68)	(-1.07)	(-1.20)	(-1.06)
Newar	1.43	1.38	1.35	2.10	2.06	2.20†
	(0.86)	(0.77)	(0.72)	(1.24)	(1.17)	(1.30)
Hill Tibeto-Burmese	0.63	0.63	0.62	0.45*	0.37*	0.41*
	(-1.23)	(-1.23)	(-1.27)	(-1.90)	(-2.24)	(-2.07)
Terai Tibeto-Burmese	0.86	0.90	0.85	0.76	0.80	0.78
	(-0.46)	(-0.34)	(-0.51)	(-0.63)	(-0.49)	(-0.57)
Duration [c]	1.43**	1.44**	1.44**	1.29*	1.32*	1.31*
	(2.56)	(2.66)	(2.63)	(1.83)	(2.03)	(1.93)
$(\text{Duration})^2$	0.96**	0.96**	0.96**	0.96*	0.96*	0.96*
	(-2.46)	(-2.51)	(-2.49)	(-2.20)	(-2.32)	(-2.26)
Person-months	16,459	16,459	16,459	17,639	17,639	17,639
-2 Log-Likelihood	127,534	127,470	127,457	146,491	147,307	146,839

Note: Numbers in parentheses are t-ratios

†p<.10; *p<.05; **p<.01; ***p<.001 (one-tailed tests)

[b] Reference Group is Upper Caste Hindu

[c] Duration is measured in years since baseline interview precise to the month

Table 4.6. Percentages by whether Censored from Multivariate Analysis Sample

	Censored from Multivariate Analysis Sample (N=229)	Included in Multivariate Analysis Sample (N=466)
Age:		
Wife Age 15-24 in 1996	20%	48% ***
Wife Age 25-34 in 1996	80%	52% ***
Husband Age 15-24 in 1996	4%	17% ***
Husband Age 25-40 in 1996	96%	83% ***
Childbearing:		
2 or more children born	98%	71% ***
3 or more children born	66%	38% ***
4 or more children born	24%	17% *
Ethnic Group:		
Upper Caste Hindu	56%	43% **
Lower Caste Hindu	10%	11%
Newar	3%	7% *
Hill Tibeto-Burmese	11%	16% †
Terai Tibeto-Burmese	20%	23%
Socioeconomic background:		
Wife went to school before marriage	55%	62% †
Husband went to school before marriage	85%	90%
Either of wife's parents ever went to school	30%	37% †
Household owns home land plot	86%	84%

†p<.10; * p<.05; ** p<.01; *** p<.001 (two-tailed tests)

CHAPTER 5

CHILDBEARING AND THE MOTHER-IN-LAW RELATIONSHIP

Introduction

Relationships with mothers-in-law come up frequently in everyday conversation, popular culture, jokes, and television shows, but the topic has not been widely studied. Close relationships are significant sources of social support and well-being, making even mother-in-law relations an important research topic (Berscheid and Reis 1998; Ellison 1990). The aim of this chapter is to improve understanding of the mother-in-law relationship by examining the role of childbearing. I apply a social exchange framework to investigate the impact of childbearing behaviors on women's perceptions of happiness in relationships with their mothers-in-law.

Most research on intergenerational relationships and family formation a) comes from European and American populations and b) focuses on the parental family. In the Nepalese context however, "affinal" relationships, which are relationships created through marriage, are also likely to be extremely salient to a woman's family and demographic behaviors. This is because historically in this setting upon marriage a daughter leaves her natal home and lives with her husband's family, under the authority of the mother-in-law (Gurung 1998; Suwal 2001). Because these women coexist so closely in the domestic sphere, the mother-in-law/daughter-in-law relationship is

fundamental to the Nepalese extended family. Despite its importance as a critical feature of the Nepalese family, the exploration of the specifics of the relationship between mother-in-law and daughter-in-law has been a neglected area of research. In this chapter I improve understanding of demographic processes and family dynamics in this setting by conceptualizing the affinal domestic sphere as an important social unit in which family formation occurs.

Some psychological and family research has explored feelings about in-law relationships in the United States. For example, studies of in-laws describe how the spouse must form familial bonds with "nonblood" kin (Apter 1986; Goetting 1990; Jackson and Berg-Cross 1988; Silverstein 1990). Other research on black American families has focused on support patterns between in-laws and children in terms of service and financial aid (Stack 1974). Finally, a few studies portray daughters-in-laws' accounts of relationships with their mothers-in-law among immigrant Asian American families (Lan 2002; Lim 1997; Min 1998; Shih and Pyke 2010; Tam and Detzner 1998).

There has been even less empirical evaluation of relationships between in-laws and children in contexts undergoing demographic change. In one cross-national study of the United States, Egypt, Kuwait, and the Sudan, children were found to perceive greater interpersonal distance and have more negative attitudes toward mothers-in-law than mothers (Adler, Denmark and Ahmed 1989). A lack of cross-national research on demographic transition and family relationships has been recently noted: "Although we know that the world's population is changing (e.g., aging, increasing numbers of generations, and having fewer children), we have very limited information about the relative influence of these changes on intergenerational relations and well-being across

cultures and countries" (Antonucci, Jackson and Biggs 2007, p.685). Key reasons for this gap in research may be that the data are rarely available and that in-law relationships may have very different meanings in different contexts. However, exploration of the dynamics of in-law relationships in diverse contexts is likely to yield important evidence of the extent to which factors related to happy relationships are context specific, and insights into what social changes are likely to reshape these relationships over time.

In this chapter I take two approaches to exploring the impact of wives' childbearing experiences on their reported relationship happiness with their mothers-in-law. First, using data from baseline interviews fielded in 1996, I conduct a cross-sectional analysis of childbearing experiences as predictors of the *level* of wives' relationship happiness with their mothers-in-law. Then, using newly available data from repeated interviews fielded in 2008, I move from cross-sectional models to longitudinal models. With a smaller sample of women who were interviewed at both times and whose mothers-in-law were still alive in 2008, I conduct a longitudinal analysis of childbearing experiences as predictors of *change* in wives' relationship happiness with their mothers-in-law between interviews.

Theoretical Framework

To guide this investigation of the link between childbearing and women's relationship happiness with their mothers-in-law, I use a social exchange framework (Emerson 1972). This framework focuses on the costs and benefits of social interaction and the degree to which people depend on one another through processes of interdependence (Blau 1964; Kelley and Thibaut 1978; Thibaut and Kelley 1959). The key predictions from the social exchange framework are that childbearing will increase a

daughter-in-law's satisfaction with the relationship with her mother-in-law, and that sons will have a greater effect than daughters on a daughter-in-law's satisfaction with the relationship with her mother-in-law. Application of the social exchange framework requires knowledge of social norms regarding childbearing and family relationships in the particular context under study. Therefore, I begin this section by describing the importance of childbearing for family relationships in Nepal. Next, I provide an overview of the social exchange framework in general terms. Finally, I apply the social exchange framework to this setting in order to detail how childbearing may affect women's perceptions of their relationships with their mothers-in-law.

The Importance of Childbearing for Family Relationships. There are strong theoretical reasons to expect childbearing to have important implications for family relationships in Nepal. Historically in Nepal living in a household with many children has been highly valued. Many social and economic activities have historically been organized within the family, making children a valuable asset (Axinn 1992; Fricke 1986). The more children there are, the more they can help with farming and household tasks, and serve as old-age security. Furthermore, in a highly gender-stratified setting such as rural Nepal, sons are especially valued. Sons may be desired for economic reasons (they can provide money to older generations), social reasons (they can provide companionship to older generations), and religious reasons (in the Hindu religion the oldest son performs death rituals for his parents). However, there are reasons for Nepali parents to want at least one daughter as well. For instance, in Hindu culture marrying off a daughter brings religious merit and social status. Additionally, daughters can help with household tasks that are not appropriate for sons.

One reason a wife may be particularly motivated to bear many children is to improve her position with her affinal relations. Historically, extended families in Nepal have been characterized by patrilocal residence, where married couples continue to reside with or nearby to the husband's parents. In this setting when young women get married they frequently join their husbands' families as outsiders. The new wife comes under the authority of her parents-in-law and husband, and this authority is most exercised by the mother-in-law in daily domestic tasks (Brunson 2010; Cameron 1998; Gray 1990). The new wife may be asked to perform the most arduous chores such as fetching firewood and fodder, cutting grass, working in the fields, husking rice, washing clothes, and scrubbing pots (Bennett 1983; Brunson 2010). Bearing many children is one of the only ways a woman can gain status in her husband's family (Bennett 1983; Gray 1990). A woman being unable to bear children or failing to bear any sons can result in her husband taking another wife and her mother-in-law looking down upon her and being unkind to her.

Overview of the Social Exchange Framework. Contemporary social exchange theory is based on the assumption that exchange relations develop within structures of mutual dependence between actors (Molm and Cook 1995). The simplest form of exchange occurs between two actors who each control at least one resource that the other values (Molm, Quist and Wiseley 1994). Resources are an actor's possessions or behavioral capabilities that are valued by other actors. Actors are dependent on one another for outcomes they value, and these actors rationally seek to maximize the outcomes they positively value (rewards) and avoid outcomes they negatively value (costs) (Bowen 1988; Molm et al. 1994). When the personal profit from social exchange

is rewarding, there is a buildup of "positive sentiments" about the relationship between the actors.

Implied is the idea of value on the amount an actor can benefit from social exchange. Relative values that actors attach to exchanges influence the impact of the exchange. The value attached to the interaction influences the amount of profit the actor receives, which influences the level of positive sentiment the actor feels. "Value" is socially determined; cultural forces determine the definition of value attached to an exchange, and thus are the source of meaning for the actors involved in the exchange (Bowen 1988).

The actors' mutual dependence on each other for valued resources provides the structural basis for their power over each other (Emerson 1962; Molm et al. 1994). Power in social exchange belongs to actors who possess greater resources – those with more resources hold more power and are in a better position to benefit from the exchange. Related to this is the idea that actors with less to gain through social exchange tend to hold more power in that exchange. Essentially, power comes from "less basic dependence" on a social exchange (Chibucos, Leite and Weis 2005, p. 138).

Because of the behavioral and rational choice assumptions about actors at the core of exchange theory, the role of emotional dynamics in social exchange has received little attention (Lawler and Thye 1999). It has been recognized however that emotions and emotional processes can improve social exchange theorizing and research (Kemper and Collins 1990; Lawler 2001). Based on social exchange concepts, Kemper and Collins proposed that relative status and power define the key aspects of a relationship and determine its emotional character (Kemper and Collins 1990). According to this

structural/relational approach, social positions impact the emotions people feel. Structural emotions, similar to "sentiments", are affective associations with the relationship determined by an actor's relative status and power. For example, one might feel happy in a relationship where one experiences adequate status and power (Smith-Lovin 1995). Furthermore, Lawler (2001) explains how emotional outcomes produced as a result of social exchange generate stronger or weaker ties to relations, groups, or networks. He argues that common everyday feelings are intertwined with exchange; when exchanges occur successfully, actors experience positive emotions (e.g. excitement, pleasure, pride, gratitude) and when exchanges do not occur successfully, actors experience negative emotions (e.g. sadness, shame, anger). Positive emotions produced by exchange processes can promote solidarity in relations or groups. This will motivate actors to interact with the same others in the future, expecting another enjoyable result. These repeated interactions could generate a group identity that binds together the actors in the network and distinguishes them from others.

There have been some empirical examinations of the role of emotional dynamics in social exchange in dyadic relations. Lab experiments have investigated how exchange processes affect the satisfaction of actors toward each other (Lovaglia 1995; Molm 1991). Other studies using survey data focus on how outcomes of social exchange, such as perceived equity in relationships, affect relationship satisfaction among married or dating couples (Goodwin 2003; Sprecher 2001). The potential of social exchange for analyzing relations among other family members or between family members and outside actors has yet to be fully realized.

Applying the Social Exchange Framework. In this analysis the mother-in-law and daughter-in-law are the mutually dependent actors. Each possesses resources valued by the other: the daughter-in-law's resource is her ability to bear children, and the mother-in-law's resource is her capacity to offer approval to the daughter-in-law. Through the exchange each receives rewards from the daughter-in-law's childbearing. The birth of a child proves that the daughter-in-law is fertile and ensures continuation of the patriline. Once the mother-in-law is assured that her daughter-in-law is capable of providing grandchildren, she may treat her more kindly. A daughter-in-law may be able to avoid strenuous household chores while she is pregnant and recovering from a birth, and may even be allowed "vacation" after the birth of a child (Bennett 1983). In addition, the mother-in-law may provide considerable help with childcare.

The mother-in-law and daughter-in-law build cohesion through this exchange of valued resources. The change in the daughter-in-law's relative social position in the household as a result of the exchange process may impact her emotions about her relationship with her mother-in-law. Increased status and kinder treatment after a successful social exchange process may improve the daughter-in-law's positive sentiments toward her mother-in-law. This may promote solidarity between them and may cause the daughter-in-law to perceive their relationship more positively.

Furthermore, research on son preference in Nepal has indicated that in this setting, sons are a resource with higher value than daughters (Leone, Matthews and Zuanna 2003; Stash 1996). Because sons are considered more beneficial to older generations, I expect the daughter-in-law's birth of sons to especially improve her treatment by her mother-in-law and improve the daughter-in-law's perception of their relationship. Therefore I

hypothesize that the bearing of children in general and of daughters specifically will both increase the daughter-in-law's positive sentiments toward the relationship with her mother-in-law, and that the bearing of sons specifically will have even greater positive effects.

Measures and Analytic Strategy

The sample, measures, and model estimation techniques that I use in this particular analytic chapter are described below. The data used in this chapter are described in detail in Chapter 3.

Theoretically it is possible that those with a high preceding propensity to get along well with a mother-in-law are also most likely to bear many children. This is perhaps the greatest threat to understanding the relationship between wives' childbearing history and their relationship with their mothers-in-law. Despite some potential endogeneity however, theoretically the actual experience of childbearing should still enable a wife to more fully realize a happier relationship with her mother-in-law, even if this wife was predisposed to have a happy relationship with her mother-in-law. Furthermore I will explicitly consider this issue by including extensive controls in models for factors that could explain a wife's family oriented predisposition. Thus I believe treating the wife's childbearing history as exogenous in models of a happy relationship with her mother-in-law is a suitable analytic strategy, granted I provide cautious interpretations of results.

Analysis Sample. This analysis involves both a cross-sectional analysis using data gathered in 1996 and a longitudinal analysis using data gathered in both 1996 and 2008. For the cross-sectional analysis, the sample is restricted to married women whose

mothers-in-law are alive at the time of the 1996 interview. Furthermore, I focus on women who have been married for more than 10 years for two reasons; first, in order to allow ample childbearing to have occurred, and second, to control for the fact that duration of marriage may positively influence both the quantity of children born and the amount of happiness in the mother-in-law relationship. This restriction results in a final sample of 768 women. Figure 5.1 shows that by limiting the sample to women married for more than 10 years, the sample represents hardly any married women age 15-24, most married women age 25-34, and all married women over age 34. However, this restriction based on marital duration does not result in a sample selective of women with living or dead mothers-in-law. Within each cohort, the percent of women married for more than 10 years whose mothers-in-law are alive is similar to the percent of women married for more than 10 years whose mothers-in-law are dead.

(*Figure 5.1, about here*)

For the longitudinal analysis, the stringent requirements of being interviewed twice and having a living mother-in-law at both interviews reduce the sample to 231 women. In 1996, there were 1,423 married women age 15-54 whose mothers-in-law were alive. Of these women, 81% (1,156 women) were re-interviewed in 2008. Furthermore, in order to use women's reports of relationship happiness with their mothers-in-law at both interviews, the sample is restricted to women whose mothers-in-law are still alive at the time of the 2008 interview. Of the 1,156 women who were re-interviewed, only 20% (233 women) had a mother-in-law still alive in 2008. Two cases are removed due to missing data on variables of interest, resulting in a final sample of 231 women. The requirement of having a mother-in-law still alive by the end of this 12-year study period

necessarily means that the youngest women are selected into this sample. In fact, the 231 women in the final sample are all between the ages of 15 and 24 in 1996.

Measures of a Happy Mother-in-Law Relationship. For the cross-sectional analysis the dependent variable of interest is the wife's report of her relationship happiness with her mother-in-law in 1996. Respondents were asked "In general, would you say that your relationship with your mother-in-law is extremely happy, very happy, somewhat happy, or not happy at all?" This measure was designed specifically for this setting via three years of unstructured ethnographic interviewing, cognitive interviewing, and repeated pilot testing before the 1996 baseline survey was administered. An analysis of the validity of this measure of mother-in-law relationship happiness was performed in Chapter 3. I code a dummy variable 1 if the respondent answered extremely happy or very happy, and 0 if she answered somewhat happy or not happy at all.

For the longitudinal analysis the dependent variable of interest is the wife's report of her relationship happiness with her mother-in-law in 2008. The survey question wording and answer choices for this measure are identical to that of the 1996 measure. However, in order to attain variation in responses between interviews at each time point, I model change in an extremely happy relationship with the mother-in-law (see Figure 5.2 for an illustration of this measure's frequency distribution at each time point for the longitudinal analysis sample). With the measure from each time point, I code a dummy variable 1 if the respondent answered extremely happy, and 0 if she answered very happy, somewhat happy, or not happy at all.[4] I include the 1996 measure in regression models as a control. This strategy of controlling for previous happiness in the mother-in-

[4] Modeling the dependent variable as very or extremely happy produces little change in the estimated effects in Tables 5.4 and 5.5.

law relationship allows me to focus on *change* in relationship happiness over the twelve years between interviews. Including this control for relationship happiness in 1996 transforms other measures in the model to predictors of change in relationship happiness between 1996 and 2008.

(*Figure 5.2, about here*)

Measures of Childbearing Experiences. In these analyses measures of childbearing history come from the life history calendars. I construct two different sets of measures of wives' childbearing experiences. The first set of measures captures childbearing experiences that occur before 1996, and the second set of measures captures childbearing experiences that occur between 1996 and 2008. Within each time period I examine three different continuous measures: the total number of children ever born, the total number of sons ever born, and the total number of daughters ever born. The number of children may have diminishing effects on the mother-in-law relationship however; that is, after a threshold has been met more children may not continue to linearly increase a wife's happiness in her relationship with her mother-in-law. Therefore I also examine dichotomous measures indicating whether any children were ever born, any sons were ever born, or any daughters were ever born. Figure 5.3 illustrates the temporal ordering of measurement.

(*Figure 5.3, about here*)

Controls for Models of Childbearing and a Happy Mother-in-Law Relationship. In order to properly specify the models, I control for various factors that may be confounders between the independent variables of interest and the mother-in-law relationship. All control measures come from the 1996 individual interview.

I control for two household characteristics: mother-in-law co-residence and household wealth. Mothers-in-law may be threatened by wives who are potentially destructive to the joint family. If the mother-in-law resides in the household then clearly the wife has not forced the joint family structure to split, which may help their relationship happiness. I code a dummy variable 1 if the mother-in-law is a resident of the same household and 0 if she resides elsewhere (this measure was treated as an independent variable in Chapter 4). Because much of the Nepalese economy is not monetized, I use a measure of whether the household is electrified as a proxy for wealth.[5]

I include two characteristics of the husband-wife relationship which may have consequences for a daughter-in-law's happiness with her mother-in-law. First, the degree to which the wife participated in arranging her marriage may impact her relationship with her mother-in-law. Respondents were asked, "People marry in many different ways. Sometimes our parents or relatives decide whom we should marry, and sometimes we decide ourselves. In your case, who selected your (most recent) spouse? Your parents/relatives, yourself, or both?" If they answered both, respondents were asked a follow-up question: "Although both of you may have decided, one of you may have had a little more influence than the other. Who had more influence in choosing your (most recent) spouse? You or your parents and relatives?" Because I hypothesize that having even partial influence over the choice of a spouse may improve a wife's relationship to her mother-in-law, I code a dichotomous measure 1 if the respondent had any participation in selecting her spouse and 0 otherwise. Second, the wife's love for her husband may impact her mother-in-law relationship happiness. I expect that wives who

[5] I also estimated the impact of whether the household owns the land on which the home is built as another potential indicator of wealth. This measure had no impact on the mother-in-law relationship.

report more love for their husbands will report happier relationships with their mothers-in-law. The measure of love is based on responses to the following question: "How much do you love your husband? Very much or some (1), a little or not at all (0)?"[6] (This measure will be treated as a dependent variable in Chapter 6).

I control for the wife's education and employment experience because these socioeconomic variables have increased dramatically over time. Education may be a source of ideational change, as schools in Nepal are modeled on the British educational system. Nonfamily employment may also expose a wife to new ideas and reduce her family integration. In these ways education and nonfamily employment may increase a sense of independence from the family, impeding parents' ability to maintain authority over children (Caldwell, Reddy and Caldwell 1988). Thus educational attainment and employment may have important consequences for how a wife views her relationship with her mother-in-law. To measure if the wife is highly educated I code a dichotomous measure 1 if she has more than 6 years of education and 0 otherwise.[7] To measure employment experience I code a dichotomous measure 1 if the wife ever participated in nonfamily work before getting married.

In addition to socioeconomic experiences, a wife's attitudes and values may play a role in her relationship with her mother-in-law. In particular I expect religiosity to increase the wife's happiness in her relationship with her mother-in-law. Studies examining Judeo-Christian religions have tied religiosity to personal happiness and well-

[6] Note that this measure of love is not a measure of "love" marriage, which is often thought of as the alternative to arranged marriage in South Asia. This measure of love is not correlated with the measure of having any say in spouse selection, suggesting that wives whose marriage was exclusively arranged by their parents do not report different levels of love for their husbands than wives who participated in choosing a husband.

[7] I also examined the impact of having at least 1 year of schooling. This effect was not statistically significant, and I do not include it in the models.

being (Steinitz 1980), marital cohesion (Bahr and Chadwick 1988; Greeley 1991; Hunt and King 1978), and parent-child relations (Landis 1960; Pearce and Axinn 1998). In Nepal, Hinduism is the dominant religion, and different ethnic groups have been "Hinduized" over time. Like Judeo-Christian religions, Hinduism also encourages strong family ties (for a detailed description of how Hinduism promotes family bonds see Pearce 2000). Therefore I expect religiosity to integrate family members in Nepal as well. Moreover, previous research indicates that the importance of religion, that is the centrality of religion in an individual's life, is a stronger influence on social relationships than religious affiliation or public behaviors like attending services. This is because people who have strongly internalized their religion's teachings are more likely to use those teachings to guide their personal relationships (Pearce and Axinn 1998). I expect that wives who place high value on religion will be more likely to translate pro-family religious teachings into behavior, acting in ways that improve family relationships. Therefore I control for religiosity with a personal measure of the internal importance of religion. The measure is based on responses to the question "How important is religion to you? Would you say it is very important (1), somewhat important or not at all important (0)?"

I also include a control for an obedient attitude toward a mother-in-law, with the expectation that a wife complying with this norm will be more likely to report a better mother-in-law relationship. Respondents were asked their agreement with the statement "After coming to her husband's home, a daughter-in-law should be obedient to her mother-in-law." I code a dummy variable 1 if the respondent answered Strongly Agree or Agree, and 0 if she answered Disagree or Strongly Disagree.

I control for wife's preceding ability to get along well with female family members by including a measure of her happiness in her relationship with her own mother. According to attachment theory, attachment styles (primarily with parents) develop during early childhood. These patterns are believed to have long lasting effects on interactions throughout adulthood by shaping the roles people adopt in future relationships (Bowlby 1988). Thus a wife's relationship with her own mother may lay the foundation for her relationship with her mother-in-law. Empirical evidence for this has been found by one U.S. study, which found that married people who reported high love for their biological parents were also likely to report high love for their in-laws, if the in-laws were perceived as resembling their biological parents (Kanin and Switzer 1973). In the multivariate models I include dummy variables for the wife having a happy relationship with her own mother and an unhappy relationship with her own mother; those wives whose own mothers have died are the reference group.

Finally, I control for ethnicity because Nepalese ethnic groups vary in marriage and family behaviors. I use five dichotomous indicators of ethnicity: Upper Caste Hindu, Lower Caste Hindu, Newar, Hill Tibeto-Burmese, and Terai Tibeto-Burmese. In multivariate models Upper Caste Hindu status is the omitted category; effects of belonging to the other ethnic groups are relative to this group.[8] In Nepal religious affiliation is not based on exclusive categories, thus a forced choice survey question on religious affiliation does not capture the extent to which the Nepalese combine religions. Ethnic groups are a more precise way to group people according to their sources of

[8] I tested for interaction effects between ethnicity and independent variables of interest. In the cross-sectional analysis the effects of number of children born and number of daughters born are both slightly lower for Terai Tibeto-Burmese (analyses not shown).

religious ideology (Pearce 2000). Because this analysis sample contains very few cases of a wife and mother-in-law reporting different ethnicity, I use the wife's report of ethnic group as a measure representing both her and her mother-in-law's ethnic group. The means and standard deviations of these variables are presented for the cross-sectional analysis sample in Table 5.1 and for the longitudinal analysis sample in Table 5.2.

(*Table 5.1, about here*)

(*Table 5.2, about here*)

Analytic Strategy. I use logistic regression procedures to estimate multivariate models of a happy relationship with a mother-in-law. Logistic regression is an appropriate statistical technique for analyzing models of dichotomous dependent variables (Kmenta 1986). I report parameters from logistic regression equations in the form

$$\ln[p/(1-p)] = \alpha + \Sigma(\beta_k)(X_k),$$

where p is the probability that a respondent reports a happy relationship with her mother-in-law, p/(1-p) is the odds that a respondent reports a happy relationship with her mother-in-law, α is a constant term, β_k represents the effects parameters of the explanatory variables, and X_k represents the explanatory variables in the model. Coefficients in a logit model give the change in the log-odds of reporting a happy relationship with a mother-in-law for a unit change in the explanatory variables. To facilitate interpretation of the coefficients, I report the exponentiated log-odds coefficients, or the odds ratios, which are interpreted as the amount by which the odds of reporting a happy relationship with a mother-in-law are multiplied for a unit change in the explanatory variable. Thus odds

ratios equal to 1 represent no effect, odds ratios greater than 1 represent positive effects, and odds ratios less than 1 represent negative effects.

Finally, because these data are hierarchically clustered, with several individuals living in the same neighborhood, I use a multilevel logit model. Recent research demonstrates that this modeling strategy is suitable to these data because it accounts for their hierarchical structure (Barber et al. 2000). Estimates are calculated using the GLIMMIX macro for SAS according to the approach described by Barber et al. 2000.

Results

Results of multivariate models of childbearing and the mother-in-law relationship are presented in Tables 5.3 through 5.5. In Table 5.3 I present the cross-sectional analysis of childbearing experiences as predictors of the *level* of wives' relationship happiness with their mothers-in-law. In Tables 5.4 and 5.5 I present the longitudinal analysis of childbearing experiences as predictors of *change* in wives' relationship happiness with their mothers-in-law between 1996 and 2008. Finally, in Table 5.6 I explore the extent of selectivity of respondents in the longitudinal analysis sample by examining the cases that were excluded from this sample. That is, I compare measures used as controls in models for women in the analysis sample and similar women who were excluded from the analysis sample because their mothers-in-law had died by 2008. Comparing these two groups of women will enable me to evaluate the potential influence of selection bias on results.

Cross-Sectional Analysis. In Table 5.3 I present the effects of wives' childbearing experiences on their relationship happiness with their mothers-in-law. Model 1 shows that the total number of children ever born is associated with higher odds of having a

happy relationship: each additional child ever born increases the wives' odds of reporting a happy relationship with their mother-in-law by 13%. Model 2 shows that the total number of sons ever born has a slightly larger influence on the odds of a happy relationship: each additional son ever born enlarges the odds by 22%. Model 3 shows that the number of daughters ever born does not significantly affect a happy relationship between a daughter-in-law and mother-in-law. Model 4 shows that the effect of the number of sons born is independent of the number of daughters born; the effect remains the same when included in the same model.[9] These findings are consistent with the hypotheses that bearing children engenders a happy relationship with a mother-in-law, and that bearing sons improves this relationship even more so than bearing daughters.[10]

(*Table 5.3, about here*)

I also tried looking at gender composition of children in many other ways. For example, I tested the ratio of sons to total number of children and the ratio of sons to daughters. These tests did not reveal any statistically significant effects. Therefore, the volume of children and sons specifically seems to be more important than gender balance in predicting relationship happiness with mothers-in-law. These effects may result from the exchange process through which both mother-in-law and daughter-in-law receive rewards from the daughter-in-law's childbearing. Successful exchanges may increase daughter-in-laws' positive sentiments toward their mothers-in-law. Successful exchanges of a more highly valued resource, sons, may build even stronger cohesion in their

[9] I also examined the impact of dummy variables for two children born, for any sons born, and for two sons born. None had significant effects on a happy relationship with a mother-in-law.

[10] To ensure that results are not biased by selective young women in this sample (the women under age 35 who have been married for more than 10 years) I re-estimated the models in Table 5.3 using only women age 35-54. Limiting the sample to the older cohorts produces virtually identical results.

relationship and cause daughters-in-law to perceive the relationship with their mothers-in-law even more positively.

Note also that many of the control variables in these models are significantly associated with the odds of a happy relationship. For example, women whose mothers-in-law live in the same house are more likely to report a happier relationship. This could be partly due to social desirability bias, i.e. that a woman reports a happy relationship because her mother-in-law is actually in the house during the interview. However this result may also lend support for the notion that people form bonds through accomplishing daily tasks together (Turner 1970). Also, women who report more love for their husbands report happier relationships with their mothers-in-law. Interestingly, high educational attainment has a strong positive association with a happy mother-in-law relationship. A daughter-in-law's internal importance of religion also strongly increases her happiness in her relationship with her mother-in-law, as is consistent with the hypothesis and with previous literature. Furthermore women with unhappy relationships with their own mothers also have unhappy relationships with their mothers-in-law, supporting the idea that interpersonal skills may affect relationships with female family members similarly. Lastly, note that ethnicity slightly influences happiness in the mother-in-law/daughter-in-law relationship. Terai Tibeto-Burmese women have lower odds of reporting a happy relationship with a mother-in-law than Upper Caste Hindus, net of other controls. A detailed exploration of the nature of the association between ethnicity and family relationships is beyond the scope of this paper. Nevertheless, these results suggest that this association may be a fruitful avenue for future research.

Longitudinal Analysis. In Table 5.4 I present estimates of the effects of childbearing experiences that occurred by 1996 on change in wives' relationship happiness with their mothers-in-law between 1996 and 2008. Recall that models treat a 2008 measure of relationship happiness as the dependent variable while controlling for the same measure from 1996. These longitudinal measurements provide some evidence that childbearing experiences increase the odds of reporting an extremely happy relationship with a mother-in-law over time. For example, Model 1 shows that the total number of children born by 1996 has a slightly significant positive effect on change in relationship happiness over the following twelve years: each additional child ever born increases the wives' odds of transitioning to an extremely happy relationship with their mothers-in-law by 35%. Model 2 shows that whether any children were born has a particularly strong effect on a happy mother-in-law relationship: wives who had born any children by 1996 have 228% higher odds of transitioning to an extremely happy relationship with their mothers-in-law over the following twelve years than wives who had not born any children at the 1996 interview. Except for a slight positive effect of having born any daughters, the remaining models in Table 5.4 show that the measures of volume of children by gender do not significantly affect change in wives' relationship happiness with their mothers-in-law between interviews.

(*Table 5.4, about here*)

Note that in these same models of change in mother-in-law relationship happiness, variation in a happy relationship with a mother-in-law in 1996 partially explains variation in a happy relationship with a mother-in-law in 2008. This is to be expected as during this twelve-year time interval many women's perceptions of their

relationships with their mothers-in-law do not change (among the sample of 231 women, 40% selected the same answer choice in both 1996 and 2008). Other controls in the model which may affect the level of relationship happiness are statistically insignificant in these models because they are not predictors of *change* in relationship happiness. However, women who love their husbands in 1996 are more likely to transition to an extremely happy relationship with their mothers-in-law than women who do not love their husbands in 1996. And interestingly, note that having participated in choosing a husband negatively impacts the transition to an extremely happy relationship with a mother-in-law. The effects of these control variables remain stable in the subsequent table; thus in Table 5.5 I do not present coefficients for control variables. Overall, considering the small sample size, the significant effects of bearing any children and the total number of children born highlight the fact that childbearing is related to changes in a wife's perception of happiness in her relationship with her mother-in-law during this twelve-year time interval.

Next, in Table 5.5 I present estimates of the effects of childbearing experiences that occurred between 1996 and 2008 on change in wives' relationship happiness with their mothers-in-law between 1996 and 2008, while controlling for pre-1996 childbearing. This table suggests that none of the measures of childbearing significantly affect the odds of transitioning to an extremely happy relationship with a mother-in-law. Several factors may explain the lack of statistical significance of these results. First, only 231 women met the criteria to be included in this analysis sample; a larger sample size may be necessary to demonstrate a statistically significant relationship between childbearing and the mother-in-law relationship. Second, twelve years elapsed between

interviews where wives reported their relationship happiness with their mothers-in-law, and the amount of childbearing that occurred during this time span was not huge (an average of 1.38 children born during this time). Because childbearing occurred infrequently during this long time span, its effect on the mother-in-law relationship would have to be very strong in order to obtain statistical significance. Third, in order to predict change in responses from one time point to another, it is necessary for responses to vary between interviews at each time point. The proportion of women reporting an extremely happy relationship with their mother-in-law increased by 5% between the 1996 and 2008 interviews, from 19% to 24%. Thus the consistency over time of wives' perceptions of their relationships with their mothers-in-law may impede the ability to predict change over time.

(*Table 5.5, about here*)

I also examined the effect of childbearing experiences that occurred between 1996 and 2008 on the odds of transitioning to an extremely happy relationship with a mother-in-law among wives who had not born any children by 1996 (analysis not shown). The effect of the total number of children born between interviews is large and significant (odds ratio 3.05, t-ratio 3.82). This result must be interpreted with caution because the model was tested on a sample restricted to 85 women (those among the longitudinal analysis sample who had born zero children in 1996). However, this result may yield some insight into the impact of childbearing on the mother-in-law relationship. This result suggests that childbearing promotes the transition to an extremely happy relationship with a mother-in-law, but that this effect is only pronounced among women

who have not yet had children.[11] A successful exchange of resources may be most rewarding among women with no children. Once a new wife proves her fertility her status in her husband's household may increase. An increase in status relative to her mother-in-law may impact a wife's emotions about her mother-in-law, promoting the wife to feel more solidarity in their relationship. Moreover the mother-in-law is most dependent on a wife for grandchildren at the beginning of the wife's childbearing trajectory; the mother-in-law may attach higher value to initial grandchildren and may treat the wife most kindly after she starts childbearing. The personal profit for both actors from subsequent exchanges may diminish because the value attached to these exchanges may diminish. Thus the start of childbearing may build the most cohesion in the mother-in-law/daughter-in-law relationship and improve the daughter-in-law's positive sentiments toward her mother-in-law. This result parallels a result demonstrated in Chapter 4 – that co-residence with a mother-in-law increases the pace into subsequent pregnancy, but only among women with no children.

Sample Selection Bias Sensitivity Analysis. The problem of selection bias may have occurred in the longitudinal analysis because respondents whose mothers-in-law had died by the 2008 interview were not observed. In order to consider the sensitivity of results to levels of selection bias I examine the cases that were excluded from the longitudinal analysis sample. In Table 5.6 I present percentages for measures used as controls in models for excluded cases in the first column and for included cases in the second column. The excluded cases are similar to those included in the sample in other

[11] When the dependent variable is modeled as a very or extremely happy relationship, effects of the total number of children born disappear. This may be due to the lack of variation between time points when this coding scheme is used.

important ways: they are women who in 1996 were married, ages 15 to 24, and had a mother-in-law alive, and were re-interviewed in 2008. The major difference is that included cases had a mother-in-law still living at the time of the 2008 interview; for excluded cases their mothers-in-law had died by 2008. Overall, the excluded cases appear similar to those included in the sample in many domains. Excluded cases are slightly less likely to have been sharing a household with their mothers-in-law in 1996 and to have participated in choosing their husbands. Excluded cases are also less likely to be highly educated. Because education was found to be positively associated with a happy mother-in-law relationship, the selection of highly educated women into the sample could introduce some bias into the results. However, for the most part the cases included and excluded are not significantly different. Thus I conclude that there is little threat of selection bias affecting results.

(*Table 5.6, about here*)

Discussion

Although the demographic literature often investigates extended families in comparison to nuclear families, research specifically focused on in-law relationship dynamics is rare. Here I provide a detailed empirical examination of childbearing and in-law relationship quality in a non-Western setting where mothers-in-law are especially influential. Applying a social exchange framework, this study investigates the impact of childbearing behaviors on a fundamental relationship in the Nepalese extended family: the mother-in-law/daughter-in-law relationship. Overall, empirical analyses produce some evidence of the influence of childbearing on wives' perceptions of their relationship with their mothers-in-law. Results from a cross-sectional analysis indicate that the more

children a wife has born, the happier she perceives the relationship with her mother-in-law. In these models the number of sons a wife has born has an even stronger association, whereas the number of daughters she has born has no association. Given the theoretical reasons for expecting childbearing to be a social exchange that influences sentiments about a relationship, these results are fitting. Because children are valuable to the mother-in-law, bearing children is likely to increase a wife's status in the relationship with the mother-in-law, which increases the wife's sentiments about this relationship. Additionally, sons have more value to a mother-in-law relative to daughters. The results are consistent with the hypothesis that value attached to the exchange does influence the impact of the exchange. A wife's status in the relationship with the mother-in-law may increase more with the births of sons, which would more strongly increase the wife's level of positive sentiment about her mother-in-law.

Results from a longitudinal analysis indicate that bearing children regardless of their gender may promote a change in wives' perceptions of their relationship with their mothers-in-law from not extremely happy to extremely happy. The effect of childbearing on change over time in the mother-in-law relationship proved difficult to test empirically, perhaps due to the extremely demanding measurement requirements for this type of analysis. Nevertheless this analysis points to the importance of incorporating in-law relationships in order to aid in the theoretical understanding of extended family dynamics and childbearing behavior in non-Western contexts.

More generally, this analysis should motivate greater attention to emotions and close personal relationships in social demographic research. Although research on fertility has historically focused exclusively on women, theory says that women live in a

web of close personal relationships which define the context of reproductive decisions. These results are only a starting point for such empirical investigations into the connections between close personal relationships and demographic behaviors. These findings acknowledge the need for demographic surveys to invest in more measures of emotions and close personal relationships.

In addition, this study demonstrates the capacity of the social exchange framework for analyzing dyadic relations. This analysis used social exchange as a framework to predict relationship happiness with a mother-in-law. It could be used to predict other aspects of the mother-in-law relationship besides happiness, such as exchanges of financial support. It also could be used to predict other outcomes for the daughter-in-law, such as her personal well-being or health outcomes. Furthermore, social exchange could be used to generate predictions across different sets of actors beyond the conventionally studied husband-wife or parent-child dyads. This research on mothers-in-law and daughters-in-law illustrates the potential of social exchange for analyzing relations among other family members. However, this flexible framework could be further broadened to analyze relations between non-familial actors, such as coworkers or friends.

The observed influence of childbearing on the mother-in-law relationship suggests that the investigation of other factors influencing this relationship will be fruitful avenues for future research. For example, contraceptive use or visits to health clinics may affect how wives' perceive their relationship with their mothers-in-law. The trends of decreasing fertility and increasing contraceptive use currently seen in this setting will present an interesting opportunity to document how these changes affect family

relationships. Finally, there are good reasons to expect that broader social changes, such as new living arrangements, non-family employment opportunities, or exposure to more Western media, will have consequences for intergenerational relationships. Researchers should consider the full breadth of consequences of these social changes for a comprehensive understanding of the relationship between social change and the family in this setting.

Figure 5.1. Percent of Each Cohort Married More Than 10 Years, by Whether Mother-in-Law is Alive, for Married Women Age 15-54 in 1996 (N=1,890)

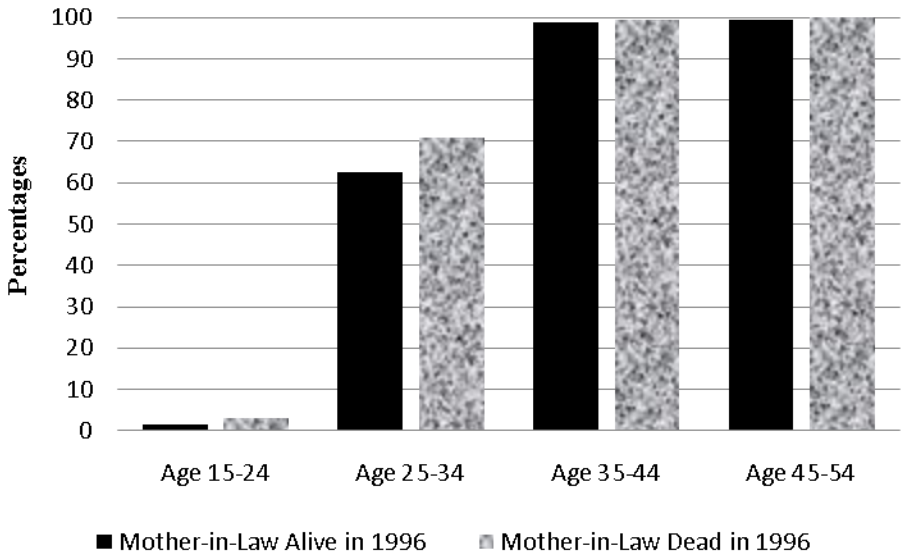

Figure 5.2. Reports of Relationship Happiness with Mothers-in-Law, by Year of Interview, for Longitudinal Sample (N=231)

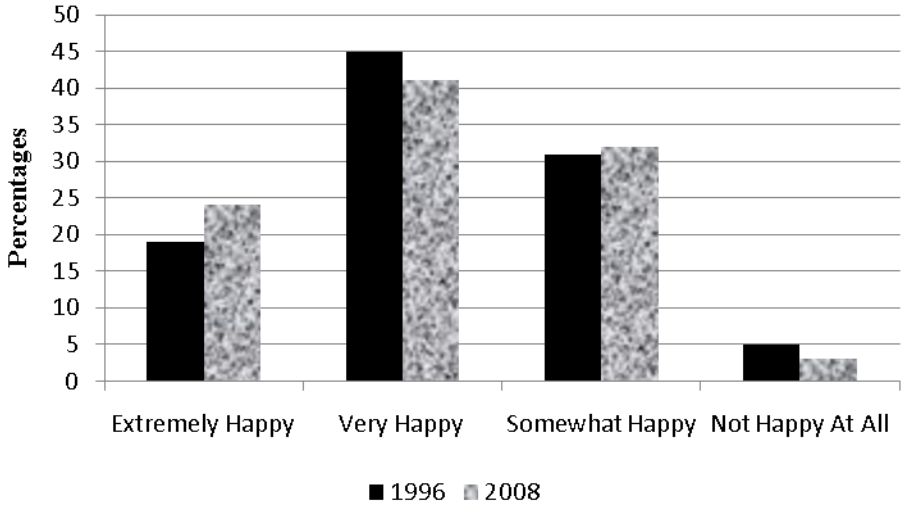

Figure 5.3. Temporal Ordering of Measurement

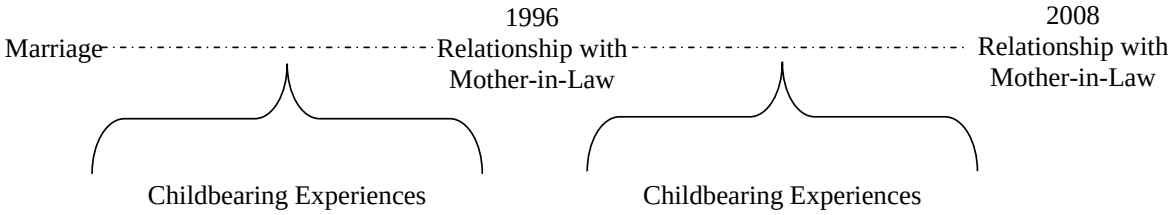

Table 5.1. Means and Standard Deviations of Variables Used in Cross-Sectional Analyses (N=768)

	Mean	Standard Deviation	Minimum	Maximum
Happy Relationship with Mother-in-Law in 1996	0.69	0.46	0	1
Childbearing Experiences by 1996:				
Total Number of Children Born	4.20	2.07	0	12
Total Number of Sons Born	2.12	1.23	0	7
Total Number of Daughters Born	2.08	1.57	0	8
Control Variables				
Household Characteristics:				
Mother-in-Law Lives in Household	0.17	0.38	0	1
Household has Electricity	0.38	0.49	0	1
Marital Relationship:				
Any Participation in Choosing Husband	0.17	0.38	0	1
Loves Husband	0.80	0.40	0	1
Wife's Background:				
Highly Educated	0.07	0.26	0	1
Nonfamily Work Before Marriage	0.15	0.36	0	1
Importance of Religion	0.65	0.48	0	1
Daughter-in-Law Should Obey Mother-in-Law	0.63	0.48	0	1
Wife's Relationship with her own Mother:				
Happy	0.72	0.45	0	1
Not Happy	0.05	0.22	0	1
Mother is Dead	0.23	0.42	0	1
Ethnic Group:				
Upper Caste Hindu	0.49	0.50	0	1
Lower Caste Hindu	0.11	0.31	0	1
Newar	0.06	0.24	0	1
Hill Tibeto-Burmese	0.16	0.37	0	1
Terai Tibeto-Burmese	0.16	0.37	0	1

Table 5.2. Means and Standard Deviations of Variables Used in Longitudinal Analyses (N=231)

	Mean	Standard Deviation	Minimum	Maximum
Extremely Happy Relationship with Mother-in-Law in 2008	0.24	0.43	0	1
Childbearing Experiences 1996 to 2008:				
Total Number of Children Born	1.38	0.99	0	4
Any Children Born	0.79	0.41	0	1
Total Number of Sons Born	0.71	0.69	0	3
Any Sons Born	0.59	0.49	0	1
Total Number of Daughters Born	0.67	0.79	0	3
Any Daughters Born	0.50	0.50	0	1
Childbearing Experiences by 1996:				
Total Number of Children Born	1.00	0.97	0	5
Any Children Born	0.63	0.48	0	1
Total Number of Sons Born	0.52	0.65	0	3
Any Sons Born	0.44	0.50	0	1
Total Number of Daughters Born	0.48	0.71	0	3
Any Daughters Born	0.38	0.49	0	1
Control Variables (all measured in 1996)				
Extremely Happy Relationship with Mother-in-Law in 1996	0.19	0.39	0	1
Household Characteristics:				
Mother-in-Law Lives in Household	0.63	0.48	0	1
Household has Electricity	0.34	0.48	0	1
Marital Relationship:				
Any Participation in Choosing Husband	0.45	0.50	0	1
Loves Husband	0.79	0.41	0	1
Wife's Background:				
Highly Educated	0.39	0.49	0	1
Nonfamily Work Before Marriage	0.34	0.48	0	1
Importance of Religion	0.48	0.50	0	1
Daughter-in-Law Should Obey Mother-in-Law	0.61	0.49	0	1
Wife's Relationship with her own Mother:				
Happy	0.89	0.31	0	1
Not Happy	0.06	0.25	0	1
Mother is Dead	0.04	0.20	0	1
Ethnic Group:				
Upper Caste Hindu	0.45	0.50	0	1
Lower Caste Hindu	0.10	0.30	0	1
Newar	0.04	0.20	0	1
Hill Tibeto-Burmese	0.16	0.36	0	1
Terai Tibeto-Burmese	0.26	0.44	0	1

Table 5.3. Logistic Regression Estimates of the Effects of a Daughter-in-Law's Childbearing Experiences by 1996 on a Happy Relationship with her Mother-in-Law in 1996 (N=768)

	Model 1	Model 2	Model 3	Model 4
Childbearing Experiences by 1996:				
Total Number of Children Born	1.13**			
	(2.65)			
Total Number of Sons Born		1.22**		1.22**
		(2.65)		(2.63)
Total Number of Daughters Born			1.08	1.08
			(1.35)	(1.32)
Control Variables				
Household Characteristics:				
Mother-in-Law Lives in Household	2.20**	2.15**	2.14**	2.19**
	(3.04)	(2.96)	(2.94)	(3.03)
Household has Electricity	0.83	0.83	0.81	0.84
	(-0.94)	(-0.96)	(-1.13)	(-0.89)
Marital Relationship:				
Any Participation in Choosing Husband	1.45	1.40	1.42	1.44
	(1.50)	(1.35)	(1.41)	(1.46)
Loves Husband	2.07***	2.07***	2.10***	2.06***
	(3.50)	(3.52)	(3.58)	(3.48)
Daughter-in-Law's Characteristics:				
Highly Educated	2.84**	2.75*	2.70*	2.85**
	(2.61)	(2.55)	(2.49)	(2.62)
Nonfamily Work Before Marriage	1.44	1.38	1.39	1.43
	(1.40)	(1.25)	(1.26)	(1.37)
Importance of Religion	2.24***	2.29***	2.29***	2.24***
	(4.48)	(4.63)	(4.64)	(4.51)
Daughter-in-Law Should Obey Mother-in-Law	1.22	1.20	1.26	1.20
	(1.05)	(0.99)	(1.22)	(0.97)
Daughter-in-Law's Relationship with her own Mother:[a]				
Happy	1.48†	1.45†	1.38	1.50†
	(1.90)	(1.83)	(1.60)	(1.96)
Not Happy	0.20***	0.19***	0.19***	0.19***
	(-3.67)	(-3.79)	(-3.73)	(-3.71)
Ethnic Group:[b]				
Lower Caste Hindu	0.61	0.62	0.61	0.62
	(-1.62)	(-1.59)	(-1.62)	(-1.60)
Newar	0.75	0.76	0.71	0.77
	(-0.81)	(-0.74)	(-0.94)	(-0.73)
Hill Tibeto-Burmese	0.86	0.84	0.85	0.85
	(-0.59)	(-0.65)	(-0.63)	(-0.60)
Terai Tibeto-Burmese	0.54*	0.54*	0.58*	0.53*
	(-2.29)	(-2.29)	(-2.04)	(-2.37)
-2 Log-Likelihood	3559.8	3554.0	3550.5	3562.4

Note: Numbers in parentheses are t-ratios

[a] Reference Group is Mother is Dead

[b] Reference Group is Upper Caste Hindu

†p<.10; *p<.05; **p<.01; ***p<.001 (two-tailed tests)

Table 5.4. Logistic Regression Estimates of the Effects of a Daughter-in-Law's Childbearing Experiences by 1996 on Change in an Extremely Happy Relationship with her Mother-in-Law from 1996 to 2008 (N=231)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Childbearing Experiences by 1996:						
Total Number of Children Born	1.35†					
	(1.74)					
Any Children Born		3.28**				
		(3.06)				
Total Number of Sons Born			1.43			
			(1.41)			
Any Sons Born				1.63		
				(1.45)		
Total Number of Daughters Born					1.27	
					(1.07)	
Any Daughters Born						1.84†
						(1.73)
Control Variables (all measured in 1996)						
Happy Relationship with Mother-in-Law	2.06†	2.17†	2.05†	2.05†	2.02†	2.08†
	(1.80)	(1.87)	(1.78)	(1.78)	(1.76)	(1.82)
Household Characteristics:						
Mother-in-Law Lives in Household	0.75	0.76	0.70	0.69	0.71	0.70
	(-0.80)	(-0.73)	(-0.97)	(-1.02)	(-0.94)	(-1.01)
Household has Electricity	1.40	1.13	1.37	1.33	1.43	1.38
	(0.75)	(0.25)	(0.71)	(0.64)	(0.80)	(0.70)
Marital Relationship:						
Any Participation in Choosing Husband	0.40*	0.35**	0.41*	0.41*	0.37**	0.34**
	(-2.55)	(-2.86)	(-2.45)	(-2.48)	(-2.77)	(-2.95)
Loves Husband	2.38†	2.48†	2.57†	2.45†	2.39†	2.41†
	(1.77)	(1.85)	(1.91)	(1.81)	(1.76)	(1.78)
Daughter-in-Law's Characteristics:						
Highly Educated	2.05	2.30†	1.91	1.94	1.90	2.00
	(1.63)	(1.84)	(1.48)	(1.52)	(1.47)	(1.57)
Nonfamily Work Before Marriage	0.99	1.02	0.92	0.91	0.95	0.97
	(-0.02)	(0.05)	(-0.22)	(-0.26)	(-0.12)	(-0.07)
Importance of Religion	1.36	1.38	1.44	1.46	1.29	1.24
	(0.90)	(0.92)	(1.07)	(1.10)	(0.75)	(0.62)
Daughter-in-Law Should Obey Mother-in-Law	1.70	1.71	1.82	1.91	1.74	1.74
	(1.24)	(1.22)	(1.42)	(1.53)	(1.30)	(1.30)
Daughter-in-Law's Relationship with her own Mother:[a]						
Happy	0.66	0.58	0.77	0.81	0.69	0.62
	(-0.49)	(-0.64)	(-0.30)	(-0.25)	(-0.45)	(-0.57)
Not Happy	0.87	0.74	1.15	1.18	0.93	0.85
	(-0.14)	(-0.29)	(0.13)	(0.16)	(-0.07)	(-0.15)
Ethnic Group:[b]						
Lower Caste Hindu	0.89	0.72	0.84	0.85	0.84	0.86
	(-0.15)	(-0.42)	(-0.23)	(-0.22)	(-0.24)	(-0.20)
Newar	1.18	1.22	1.26	1.18	1.23	1.15
	(0.19)	(0.22)	(0.28)	(0.20)	(0.24)	(0.16)
Hill Tibeto-Burmese	1.78	1.84	1.70	1.68	1.71	1.81
	(0.99)	(0.99)	(0.93)	(0.91)	(0.92)	(1.00)
Terai Tibeto-Burmese	2.31	2.28	2.25	2.24	2.46	2.53†
	(1.53)	(1.43)	(1.51)	(1.51)	(1.64)	(1.66)
-2 Log-Likelihood	1092	1115	1089	1088	1091	1097

Note: Numbers in parentheses are t-ratios

[a] Reference Group is Mother is Dead

[b] Reference Group is Upper Caste Hindu

†p<.10; *p<.05; **p<.01; ***p<.001 (two-tailed tests)

Table 5.5. Logistic Regression Estimates of the Effects of a Daughter-in-Law's Childbearing Experiences between 1996 and 2008 on Change in an Extremely Happy Relationship with her Mother-in-Law from 1996 to 2008 (N=231)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Childbearing Experiences 1996 to 2008:						
Total Number of Children Born	0.98					
	(-0.10)					
Any Children Born		0.95				
		(-0.10)				
Total Number of Sons Born			0.77			
			(-0.97)			
Any Sons Born				0.75		
				(-0.77)		
Total Number of Daughters Born					1.08	
					(0.36)	
Any Daughters Born						1.08
						(0.22)
Childbearing Experiences by 1996:						
Total Number of Children Born	1.34	1.34				
	(1.43)	(1.49)				
Total Number of Sons Born			1.26	1.30		
			(0.80)	(0.92)		
Total Number of Daughters Born					1.29	1.29
					(1.11)	(1.09)
-2 Log-Likelihood	1093	1091	1092	1091	1093	1092

Note: Numbers in parentheses are t-ratios

†p<.10; *p<.05; **p<.01; ***p<.001 (two-tailed tests)

Table 5.6. Percentages by whether Included in Longitudinal Analysis Sample due to Mother-in-Law Still Alive by 2008

	Excluded from Longitudinal Analysis Sample (N=124)	Included in Longitudinal Analysis Sample (N=231)
Variables Measured in 1996		
Extremely Happy Relationship with Mother-in-Law	23%	19%
Household Characteristics:		
Mother-in-Law Lives in Household	54%	63% †
Household has Electricity	26%	34%
Marital Relationship:		
Any Participation in Choosing Husband	35%	45% †
Loves Husband	76%	79%
Wife's Background:		
Highly Educated	27%	39% *
Nonfamily Work Before Marriage	29%	34%
Importance of Religion	54%	48%
Daughter-in-Law Should Obey Mother-in-Law	67%	61%
Wife's Relationship with her own Mother:		
Happy	85%	89%
Not Happy	8%	6%
Mother is Dead	6%	4%
Ethnic Group:		
Upper Caste Hindu	44%	45%
Lower Caste Hindu	15%	10%
Newar	3%	4%
Hill Tibeto-Burmese	17%	16%
Terai Tibeto-Burmese	21%	26%

†p<.10; * p<.05; ** p<.01; *** p<.001 (two-tailed tests)

CHAPTER 6

CONTRACEPTIVE USE AND CHANGING MARITAL DYNAMICS

Introduction

Relationship characteristics are often thought of as an important determinant of contraceptive use (Ford, Sohn and Lepkowski 2001; Howard et al. 1999; Katz et al. 2000; Ku, Sonenstein and Pleck 1994; Kusunoki 2010; Kusunoki and Upchurch 2010; Laumann et al. 1994; Manlove, Ryan and Franzetta 2007; Manning, Longmore and Giordano 2000; Soler et al. 2000; Wingood and DiClemente 1998a). Far less attention has been paid to the opposite direction of association: that contraception or reductions in fertility may affect partner relationships. Documented research on this aspect of contraception is sparse. However, this topic deserves to be of concern because problems in the partner relationship caused by contraceptive methods may provoke discontinuation of these methods. The aim of this chapter is to improve understanding about how contraceptive methods affect dynamics within marriage in a setting where the spread of contraception represents dramatic social change.

In this chapter I expand on the current literature in several ways. First, most research on marital relationship quality comes from European and American populations. There has been relatively little research on the factors affecting marital relationships in settings like rural Nepal, and such investigations in dramatically different non-Western

settings are likely to demonstrate that the effects of contraceptives on the marital relationship are specific to the cultural context. Second, I exploit measures of marital dynamics at two time points, in order for contraceptive use to predict *change* in marital dynamics from one time point to another. This longitudinal design is a fundamental methodological advance that helps to provide new insights into the causal nature of the relationship between contraceptive use and dimensions of the husband-wife relationship. Predicting change in marital dynamics over time allows for stronger inferences regarding the possible causal role of contraceptive use, as compared to analyses of cross-sectional data or longitudinal data without controlling for earlier levels of marital dynamics. Third, I examine a variety of contraceptive methods: oral contraceptive pills, Depo-Provera, and both female and male sterilization. Distinguishing the effects of different types of contraceptive methods will enrich our overall understanding of the influence of contraceptive use on marital dynamics. Fourth, I incorporate both women's and men's reports of marital dynamics, since research using only one spouse's perceptions of a marital relationship may not uncover the whole story.

Furthermore, I consider the multidimensional nature of the marital relationship. I incorporate several key marital dynamics likely to be affected by childbearing behavior: disagreement, domestic violence, and love. Of course, dimensions of the husband-wife relationship may be related to each other. For example, spouses who disagree more often may be more likely to have experienced domestic violence. Studies of marital quality in the United States have identified the need to formulate hypotheses regarding specific dimensions of the marital relationship, rather than positing one underlying construct (Lewis and Spanier 1979; Johnson et al. 1986; Fincham and Bradbury 1987; Sabatelli

1988). Consistent with previous research, I employ this approach and consider dimensions of the marital relationship separately rather than combining them to represent "marital quality" as one underlying construct (Hoelter, Axinn and Ghimire 2004). This theoretical framework emphasizes that the adoption of contraceptive methods may not necessarily have wholly positive or wholly negative effects on an overall marital relationship.

Rural Nepal is an excellent setting to examine contraceptive use and marital dynamics because this study area is currently undergoing rapid changes in the meaning of marital relationships. Recently dramatic social, economic, and institutional changes have promoted the emergence of marital relationships based on a close emotional bond between husbands and wives (Hoelter et al. 2004), thereby creating substantial variation in husband-wife relationships. Rural Nepal is also an excellent setting because this population only recently began a transition to widespread use of contraception (Axinn and Yabiku 2001). This setting, then, provides an ideal opportunity to examine the relationship between contraceptive use and marital dynamics.

Theoretical Framework

Historically in patriarchal societies, one of the major assumptions about gender was that men have an inherent right to control the sexuality and reproductive functions of women, while women have no such right over men (Lerner 1993). The availability of contraception can transform women's control over childbearing and, in turn, fundamentally transform the nature of the rest their lives (McDonald 2000). A woman's ability to control her fertility, however, has been described as a "mixed blessing" (Waszak et al. 2001). Contraceptives may have both costs and benefits for marital

relationships. In this section I detail mechanisms through which contraceptive use may have costs for marital relationships and then mechanisms through which contraceptive use may benefit marital relationships.

Costs of Contraceptive Use for Marital Relationships. Childbearing has been found to be a fundamental aspect of marriage in Nepal (Bennett 1983; Folmar 1992; Fricke 1986; Stash 1999; Stone 1978). In Hindu society marriage has historically been considered a means to continue the family line, and most parents depend on income provisions from their children for financial support in old age. Having children may be a collective goal for both husbands and wives, because children may benefit both spouses with improved positions in the household. For a wife, her position in the affinal household greatly depends on her husband. When she bears his children, a husband may offer her more support. Childbearing as a means to gain her husband's favor may be a wife's most effective way to gain respect in the household. For a husband, children may increase both his self-esteem and prestige within the family. Studies have found that husbands may view children as a means to achieve emotional and psychological satisfaction (Hekmat, Kabacoff and Klein 1983). Relations between males in the joint family may be competitive, and children may be one means that male relatives use to vie for prestige. Because children are such a valuable economic, social, and religious asset to a couple, it is not surprising that historically in rural Nepal childlessness has been known to produce higher levels of conflict and lower levels of satisfaction within marriages (Bennett 1983; Stone 1978). In fact, childbearing is so essential to a marital relationship in this setting that the failure to bear children can be considered legitimate grounds for

divorce or marriage to a second spouse (Bennett 1983; Folmar 1992; Fricke 1986; Stash 1999; Stone 1978).

Contraceptive use may empower women to undermine their affinal families' expectations of high fertility. However, although it may be empowering in some ways, contraceptive use may also generate psychological costs for both spouses. Psychological costs are the social-psychological forces that imply negative judgment of contraceptives, causing emotional stress. Individuals who use contraception may feel anxiety or guilt about using contraception if they perceive disapproval from their spouses, their extended family, or the greater society. Furthermore, because effective and sustained use of contraception requires communication about sexual intercourse, couples may incur psychological costs if discussing intercourse violates social norms of modesty and privacy in sexual matters (Beckman 1983). For husbands in particular, psychological consequences of contraceptives may involve loss of feelings of manliness if they are no longer able to impregnate their wives. These psychological costs induced by contraceptive use may aggravate relations between spouses, potentially resulting in disagreement or physical abuse.

Contraceptive use may also aggravate the marital relationship by promoting role conflict. When women limit their fertility they may have opportunity for employment outside of the home. Leaving the security of the traditional role of homemaker and acquiring the formerly male role of employee may cause role conflict within individual women. Moreover, in highly gender stratified societies such as rural Nepal, role conflict between family roles and work roles may be exacerbated. Husbands may feel threatened

by women gaining equal opportunity in employment, and the marital relationship may be strained while husbands and wives sort out their new roles (Waszak et al. 2001).

Despite the theory there is limited empirical evidence documenting a negative impact of contraceptives on marital relations in developing countries. Bawah et al. (1999) found that in focus group discussions in northern Ghana, both men and women highlighted the benefits of contraception but also the strained gender relations contraceptives can cause. Wives reported that contraceptives could generate marital discord, physical abuse, and conflict with their husbands' extended family. Some husbands reported contraceptives as anxiety provoking; in particular they worried that women who practice contraception might be unfaithful. Another study in Bangladesh found that long acting hormonal contraceptives (female injectables and implants) were followed by declines in marital satisfaction (Khandaker, Vereecken and Nijs 2002), while a study in Egypt found that the use of family planning promoted higher levels of anxiety (Waszak et al. 2001).

Much of the empirical research linking contraceptive use and strained marital relations focuses on domestic violence, although this research has not been conclusive. In a family or society structured by patriarchal control, males exercise authority over females. Patriarchal norms may dictate certain circumstances in which husband to wife physical abuse is an acceptable means to reinforce the wife's subordinate position (Ellsberg et al. 2001; Garcia-Moreno et al. 2005; Koenig et al. 2003; Koenig et al. 2006; Schuler, Hashemi and Badal 1998; Wilson-Williams et al. 2008). Women who use contraception in such situations may be vulnerable to opposition from their husbands or affinal families.

A growing literature is recognizing an association between domestic violence and unintended pregnancy, primarily explained by the violence severely hindering women's ability to practice contraception. Traditionally such evidence has come from studies conducted in the United States (Campbell et al. 1995; D'Angelo et al. 2004; Gazmararian et al. 1995; Saltzman et al. 2003) but empirical evidence documenting the association between domestic violence and unintended pregnancy in less developed countries has recently started to expand (Hof and Richters 1999; Kaye et al. 2006; Kishor and Johnson 2006; Martin et al. 1999; Pallitto and O'Campo 2004, 2005; Purwar et al. 1999; Silverman et al. 2007). Several studies based in the United States have also found domestic violence linked explicitly to lower likelihood of contraceptive use (Eby et al. 1995; Kalichman et al. 1998; Wingood and DiClemente 1998b). Although all of these studies indicate a relationship between domestic violence and fertility outcomes, they are mostly limited to cross-sectional data, rendering the direction of a possible causal effect unclear.

Raising further query about the relationship, several other studies from less developed countries suggest that the direction of association runs from contraceptive use to domestic violence. Studies in African settings have shown that a woman's use of contraception or visiting family planning clinics justifies beating her (Ezeh 1993; Wood and Jewkes 1997) or that even the threat of violence leads women to forgo using contraceptives (Bawah et al. 1999). Another common interpretation is that wives' contraceptive use leads husbands to fear a loss of control or suspect their wives of being unfaithful, precipitating physical abuse (Biddlecom and Fapohunda 1998; Blanc 2001; Clark et al. 2008; Kaye 2006; Rao 1997).

Only a handful of studies using longitudinal data from India have been able to establish temporal ordering of events to explicate the relationship between domestic violence and contraception (Stephenson et al. 2008; Stephenson, Koenig and Ahmed 2006). Their results find that women who had experienced domestic violence before using contraceptives were significantly less likely to later use contraceptives. In this chapter I use repeated interviews to demonstrate the opposite direction of association. This is among the first studies to use longitudinal data to examine contraceptive use as a predictor of increasing domestic violence from one time point to another.

Benefits of Contraceptive Use for Marital Relationships. In spite of the growing evidence of the negative impacts of contraceptives for marital relationships, there is good reason to believe that contraceptives may also have benefits for spouses' marital dynamics. Empirical evidence of contraceptives improving marital relationships in developing countries is scant. One unpublished study in Malaysia found that women who had ever used contraception reported improved spousal relations and were less likely to get divorced (Kritz 2010).

Contraceptives may improve marital relationships through several possible mechanisms. First, using contraceptives and having fewer children may engender both health benefits and job opportunities. Wives who are healthy and can earn money may contribute to marital satisfaction and stability. Research in the United States has revealed that married women's increased financial contributions to the total family income are associated with greater marital happiness and stability (Rogers and DeBoer 2001; Schoen, Rogers and Amato 2006).

Second, contraceptive use may cause couples to attach a different meaning to sexual intercourse. Without contraception, sexual relations may be restricted to the purpose of reproduction of the family. Contraceptives facilitate sexual intercourse taking on the purpose of physical gratification or emotional fulfillment between partners without the intention to procreate. The separation of sexuality and reproduction could fundamentally transform a marital relationship. A couple's improved sexual life without the fear of unplanned pregnancy could improve other dynamics of the marital relationship.

Third, both contraceptives and the concept of romantic love are associated with individuals' ability to control their own lives in Nepal. According to Ahearn, "...there is no universal, ahistorical experience of romantic love that all humans share" (Ahearn 2001, p.48). Rather, like all other emotions, love accrues meanings in specific cultural contexts and at given time points. In her ethnography, Ahearn contends that the meaning of romantic love has changed significantly in recent years for many Nepalis (Ahearn 2001). The concept of romantic love has in recent decades become interconnected both with capitalistic notions of success and with the way Nepalis conceive of their own ability to act. Romantic love is associated not only with economic development, but also with a sense of agency attributing responsibility for events to individuals instead of fate. Incorporating love as a key dimension of the marital relationship may provide valuable new insights into the ways in which love is context specific and the extent to which the transition to contraceptive use is a social change shaping the meaning of spousal love in

this setting.[12] Contraceptives may have an empowering effect giving women feelings of greater control over their reproductive health. Feelings of control over their own bodies may translate into feelings of control in other areas of life, such as family relationships. Wives who feel they have agency in their marital relationships may associate this with stronger feelings of love for their husbands.

Measures and Analytic Strategy

The sample, measures, and model estimation techniques that I use in this particular analytic chapter are described below. The data used in this chapter are described in detail in Chapter 3.

Analysis Sample. Only individuals between the ages of 15 and 34 who have been married 15 years or less at the 1996 baseline interview are included in these analyses. Respondents who are sterilized or whose spouse is sterilized by 1996 are excluded from the sample. Furthermore, in order to use respondents' reports of marital dynamics in both 1996 and 2008, the sample is restricted to individuals who answered the survey questions on marital dynamics at both interviews. These restrictions result in a sample of 566 women and 313 men. Analyses are run separately for women and men in order to explore gender differences in the effects of contraceptive use on reports of marital dynamics.

Furthermore, respondents who have ever used oral contraceptive pills are excluded from models estimating the effects of pill use on changing marital dynamics. Likewise, respondents who have ever used Depo-Provera are excluded from models estimating the effects of Depo-Provera use on changing marital dynamics. I focus on

[12] Note that this is not a measure of "love" marriage, which is often thought of as the alternative to arranged marriage in South Asia. Empirical evidence from this setting suggests that couples whose marriage was exclusively arranged by their parents do not report different levels of love for their spouse than couples who participated in choosing each other (Hoelter et al. 2004).

respondents who have not used the particular method being examined in order to ascertain the effects of the start of this method on change in marital dynamics. This proper temporal ordering helps to yield a better understanding of the relationship between the contraceptive being examined and changing marital dynamics.

Measures of Marital Dynamics. The dependent variables of interest are dynamics of husband-wife relationships within marriage in 2008. I examine several dimensions of the husband-wife relationship including disagreement, domestic violence, and love, all of which are coded toward increasing frequencies/magnitudes. These items are similar in scope to items often employed in studies of marital quality in Western settings (Amato et al. 2003; Booth, Johnson and Edwards 1983; Johnson et al. 1986; Norton 1983; Sabatelli 1988; Spanier 1976). However, these measures were the product of three years of ethnographic work and pilot testing so that they could be adapted into culturally appropriate versions for Nepal. Testing each marital dynamic as a dependent variable will enable me to compare the impacts of contraceptive use on each different dimension of the husband-wife relationship. Furthermore, I also compare the impacts of contraceptive use on women's versus men's reports of these relationship dynamics. The aim of this analytic component, however, is to document effects of contraceptive use on reports of marital dynamics by gender, and not to explore concordance in spouses' reports of marital dynamics.

I use a longitudinal research design to control pre-existing marital dynamics. In each regression model of a specific marital dynamic in 2008, I include the 1996 measure of that same marital dynamic as a control. The survey question wording and answer choices for measures of marital dynamics are identical at each interview. This strategy of

controlling for previous marital dynamics allows me to focus on *change* in marital dynamics over the twelve years between interviews. Including a control for an earlier level of a marital dynamic transforms other measures in the model to predictors of change in that particular marital dynamic between 1996 and 2008.

The first dimension of the marital relationship that I examine is the frequency of disagreement that a respondent reports with his/her spouse. The survey question reads "How often do you have disagreements with your (husband/wife)? Frequently or sometimes (3), seldom (2), or never (1)?" Because very few husbands or wives report frequent disagreements with their spouse I combine the response categories "frequently" and "sometimes".

The second marital dynamic measured is domestic violence. I use a question asking a wife if her husband has ever beaten her; a dichotomous measure is coded 1 for yes and 0 for no. Husbands' reports of whether they have ever beaten their wives are not measured in the survey; therefore only women's perspectives on domestic violence as a marital dynamic are used. The percent of women in this sample who report having ever been beaten by their husbands increased from 12% to 16% between the 1996 and 2008 interviews. Of course, measurement error may be caused by limiting the question to having ever been "beaten". As a result, I assume that this analysis underestimates the actual prevalence of domestic violence and indicates a weaker relationship between contraceptive adoption and domestic violence than actually exists. A measure incorporating a wider variety of physical and sexual acts of violence that fall within the domain of domestic violence may reduce some measurement error caused by this

narrower question. However, I believe that a more wide-ranging measure would only produce stronger results.

The third marital dynamic pertains to conjugal love. Of course love is a difficult concept to measure in any survey, and this may be one reason it has been neglected in demographic research. The measure of love I use is based on responses to the following question: "How much do you love your (husband/wife)? Very much (3), some (2), a little or not at all (1)?" Again, because very few husbands or wives report loving their spouse "not at all" I combine the response categories "a little" and "not at all". This measure was designed specifically for this setting, via three years of unstructured ethnographic interviewing and repeated pilot testing before the 1996 baseline survey was administered. An analysis of the validity of this measure of love was performed in Chapter 3.

Additionally, dimensions of the husband-wife relationship may be related to each other. For wives' reports of marital dynamics measured in 1996, disagreement is correlated positively with violence ($r = 0.29$, $p<0.001$) and negatively with love ($r = -0.16$, $p<0.001$). Violence and love are slightly negatively correlated ($r = -0.09$, $p<0.05$). For husbands' reports of marital dynamics measured in 1996, disagreement is slightly negatively correlated with love ($r = -0.10$, $p<0.10$). Thus I treat these measures as distinct dependent variables rather than constructing a scale, as is consistent with the theoretical approach of considering dimensions of the marital relationship separately.

Measures of Contraceptive Use. The independent variables in this chapter capture contraceptive use that occurred in the time period between the 1996 and 2008 individual interviews. These measures come from the prospective monthly panel data. I analyze these prospective measures of respondents' contraceptive use for a total of 126 months,

from February 1997 through July 2007. I examine the four contraceptive methods which were most commonly used among respondents or their spouses during this time period: oral contraceptive pills, Depo-Provera, female sterilization (tubal ligation), and male sterilization (vasectomy). For each of these four methods, I code a dichotomous variable 1 if the respondent (or his/her spouse) ever used the method during this time period and 0 otherwise (of course, some respondents who ever used the pill or Depo-Provera could have also become sterilized later).

Controls for Models of Contraceptive Use and Changing Marital Dynamics. In order to properly specify the models, I control for various factors that may be confounders between contraceptive use and marital dynamics. All control measures come from the 1996 individual interview.

I control for education in both the respondent and parental generation, because previous research suggests that education may be an important determinant of marital quality in this setting (Hoelter et al. 2004). Education may be a source of ideational change about the nature of marital relationships. Because schools in Nepal are modeled on the British educational system, it is likely that the more time respondents spend in school the more they are exposed to Western ideas about marriage based on an emotional bond (Caldwell 1982; Fricke 1986; Thornton 2001; Thornton and Lin 1994). Thus educational attainment may have important consequences for how a respondent evaluates various dynamics with his/her spouse. To measure if the respondent is highly educated I code a dichotomous measure 1 for more than 6 years of education and 0 otherwise. I also control for parents' education, because this is a key parental experience that may affect both children's contraceptive use and the nature of their marriages. Because education

was rare in the parental generation in Nepal, the measure of parents' education is a combination of responses to questions about whether the respondent's father and mother had ever attended school. It is coded 1 if either parent ever went to school and 0 otherwise.

I control for two other background demographic characteristics: age and ethnicity. I include a dichotomous indicator of being in the younger age group (age 15 to 24 at the 1996 interview). The older age group (age 25 to 34 in 1996) is the reference category. I control for ethnicity because Nepalese ethnic groups have diverse propensities to use contraceptives (Axinn and Barber 2001) and because these groups vary in marriage practices and behaviors (Hoelter et al. 2004). I use five dichotomous indicators of ethnicity: Upper Caste Hindu, Lower Caste Hindu, Newar, Hill Tibeto-Burmese, and Terai Tibeto-Burmese. In multivariate models Upper Caste Hindu status is the omitted category; effects of belonging to the other ethnic groups are relative to this group.

I include two marital experiences which may have consequences for the husband-wife relationship. First, the degree to which respondents participated in arranging their marriages may impact their marital relationships. Respondents were asked, "People marry in many different ways. Sometimes our parents or relatives decide whom we should marry, and sometimes we decide ourselves. In your case, who selected your (most recent) spouse? Your parents/relatives, yourself, or both?" If they answered both, respondents were asked a follow-up question: "Although both of you may have decided, one of you may have had a little more influence than the other. Who had more influence in choosing your (most recent) spouse? You or your parents and relatives?" I code a

dichotomous measure 1 if the respondent participated at all in selecting his/her spouse and 0 otherwise.

Finally, I include a control for the number of children born by 1996, because this may have important implications for both contraceptive use after 1996 and change in marital dynamics after 1996.[13] Research in the United States has found the presence of children in the home and the transition to parenthood to negatively affect marital quality, at least while children are young (Belsky, Lang and Rovine 1985; Kurdek 1999). This is in part because children demand extra housework and childcare duties, and interfere with both the quantity and quality of spouses' time together (Helms-Erickson 2001). A previous analysis of CVFS data determined that the presence of children, as measured by the couple having any child, significantly increased husbands' reports of the level of disagreement (Hoelter et al. 2004). The means and standard deviations of these variables are presented in Table 6.1.

(*Table 6.1, about here*)

Analytic Strategy. I use two statistical approaches in this analysis of changing marital dynamics, depending on the particular marital dynamic being examined. In models of domestic violence, because the dependent variable is dichotomous I use logistic regression procedures. Logistic regression is an appropriate statistical technique for analyzing models of dichotomous dependent variables (Kmenta 1986). In models of disagreement and love, because the dependent variable is ordinal I use ordered logistic regression procedures. This technique can be thought of as an extension of the logistic regression model for dichotomous dependent variables, allowing for more than two

[13] I also examined the impact of number of sons born by 1996 and number of daughters born by 1996. Their effects were not statistically significant and I do not include them in the models.

response categories. Ordered logistic regression treats the outcome variable as ordinal under the assumption that its categories have a natural ordering but that distances between adjacent categories are unknown (Allison 1999). For example, the distance between answers "never" and "sometimes" may not equal the distance between "sometimes" and "often". For all of these regression models, I present exponentiated log-odds coefficients, or the odds ratios, which are interpreted as the amount by which the odds of the dependent variable are multiplied for a unit change in the explanatory variable. Thus odds ratios equal to 1 represent no effect, odds ratios greater than 1 represent positive effects, and odds ratios less than 1 represent negative effects.

Results

Results of multivariate models of contraception and changing marital dynamics are presented in Tables 6.2 through 6.6. Tables 6.2 and 6.3 examine the influence of contraceptive use on change in frequency of disagreement among women and men, respectively. Table 6.4 examines the influence of contraceptive use on change in having ever been beaten (recall that only wives' perspectives on domestic violence as a marital dynamic are analyzed). Tables 6.5 and 6.6 examine the influence of contraceptive use on change in the amount of love for a spouse among women and men, respectively. In each table, the first model examines the effect of oral contraceptive pills, the second model examines the effect of Depo-Provera, the third model examines the effect of female sterilization, and the fourth model examines the effect of male sterilization. Results of all analyses are discussed in detail below.

Frequency of Disagreement. In Table 6.2 I present estimates of the effects of contraceptive use that occurred from 1997 to 2007 on change in women's reports of

disagreement with their husbands between 1996 and 2008. Recall that models treat a 2008 measure of disagreement as the dependent variable while controlling for the same measure from 1996. These longitudinal measurements suggest that contraceptive use increases the odds of reporting more frequent disagreement with a husband over time. For example, Model 1 shows that using oral contraceptive pills has a slightly significant positive effect on change in disagreement over time: having ever used the pill increases women's odds of transitioning to a higher level of disagreement with their husbands by 48%. Model 2 shows that Depo-Provera has a particularly strong effect on increasing disagreement: women use used Depo-Provera have 78% higher odds of transitioning to a higher level of disagreement with their husbands than women who did not use Depo-Provera. The remaining models in Table 6.2 show that neither type of sterilization significantly affects change in women's reports of disagreement with their husbands between interviews.

(*Table 6.2, about here*)

Note that in these same models, frequency of disagreement in 1996 strongly predicts frequency of disagreement in 2008. This is likely due to the reliability of the measure of disagreement and due to women's reports of disagreement only increasing by a small amount (from an average of 1.81 to 1.97, or approaching an average answer of "seldom", as shown in Table 6.1). Other controls which may affect the level of disagreement are statistically insignificant in these models because they are not predictors of *change* in disagreement. Considering that most of the variables in these models are unable to significantly predict a transition toward a higher level of disagreement during

this twelve-year time interval, the significant effects of using oral contraceptive pills and using Depo-Provera are even more remarkable.

Also note from Table 6.2 that ethnicity is related to change in spousal disagreement. Lower Caste Hindu women have higher odds of reporting increasing disagreement over time than Upper Caste Hindu women. A detailed exploration of the nature of the relationship between ethnicity and changing marital dynamics is beyond the scope of this paper. Nevertheless, these results suggest that this relationship may be a fruitful avenue for future research.

Next, in Table 6.3 the same four models are run predicting change in men's reports of disagreement with their wives between 1996 and 2008. Model 1 shows that for men, having a wife who uses oral contraceptive pills increases the odds of reporting increasing spousal disagreement by 109%. Thus pill use appears to more strongly affect men's reports of increasing disagreement than women's reports. Having a wife who uses Depo-Provera, however, does not predict increasing disagreement over time from the perspective of men, as shown in Model 2. As with women's reports of disagreement, neither type of sterilization significantly affects change in men's reports of disagreement with their spouses between interviews.

(*Table 6.3, about here*)

Ever Beaten by Spouse. In Table 6.4 I present estimates of the effects of contraceptive use that occurred from 1997 to 2007 on change in women's reports of having ever been beaten by their husbands between 1996 and 2008. Recall that this dependent variable is binary; thus models predict having ever been beaten in 2008 controlling for having ever been beaten in 1996. Model 1 shows that women who used

oral contraceptive pills have 87% higher odds of transitioning to having been beaten by their husbands than women who did not use oral contraceptive pills. Having ever been beaten in 1996 strongly predicts having ever been beaten in 2008, due to only a 4% increase in the percent of women in this sample who report having ever been beaten by their husbands over the twelve years between interviews. Again, reduced measurement error as well as more variation in responses between interviews may yield a stronger relationship between contraceptive adoption and increased incidence of domestic violence. Nevertheless the fact that pill use attains statistical significance highlights the fact that it is related to the transition of wives experiencing domestic violence during this twelve-year time interval.

(*Table 6.4, about here*)

Love for Spouse. In Table 6.5 I present estimates of the effects of contraceptive use on change in women's reports of how much they love their husbands between 1996 and 2008. Interestingly, the only type of contraceptive method that significantly affects the transition to a greater amount of reported love for husbands is the male method. Model 4 shows that for women, having a husband who got a vasectomy between 1997 and 2007 increases the odds of reporting more spousal love over time by 68%. This finding may indicate that wives may appreciate husbands who are willing to be actively involved in family planning and choose to get vasectomized.[14]

(*Table 6.5, about here*)

[14] I tested the effect of "either husband or wife got sterilized" on change in each marital dynamic. The effects on change in having ever been beaten or change in frequency of disagreement were not statistically significant. The effect on change in love was significant (odds ratio = 1.61, t-ratio = 2.79) but mainly driven by the effect of male sterilization on change in love.

Finally, in Table 6.6 the same four models are run predicting change in men's reports of love for their wives between 1996 and 2008. For men, none of the types of contraceptive methods significantly affect the odds of transitioning to reporting a greater amount of spousal love over time. The smaller sample size of men may be preventing measures of contraceptive use from being able to explain more of the impact of contraceptive use on increasing love for wives. Otherwise, it may be that husbands interpret differently what it means to love a spouse. Explorations of other substantial dimensions of the concept of love and investment in direct measures of these dimensions will be necessary to fully understand the influence of childbearing behavior on spousal love. For example, social psychologists have attempted to measure the construct of romantic love by creating scales to combine dimensions of love, and using these scales to differentiate between the degree of "loving" a romantic partner and "liking" a platonic friend (Rubin 1970).

(*Table 6.6, about here*)

Given the theoretical reasons for expecting marital relationships to be multidimensional, these results are fitting. Each changing dynamic measured in these analyses captures a different dimension of the marital relationship and demonstrates different influences of contraceptive use. Furthermore, there are likely to be other key changing marital dynamics unmeasured in these analyses, which may be impacted by contraceptive use. These results acknowledge the need for demographic surveys to include more measures of separate specific dimensions of marital relationships.

Discussion

Despite the theoretical importance of the extended family in societies in demographic transition, social demographers have neglected to research factors influencing marital dynamics in these societies. This chapter presents a detailed empirical examination of contraceptive use and changing marital dynamics in a setting in which, until the recent past, fertility limitation has been virtually nonexistent. Overall, empirical analyses indicate that contraceptive use may impact change in husband-wife relationship dynamics from an initial time point to another time point twelve years later. The most prominent finding to emerge from these analyses is that the oral contraceptive pill provokes increasing conflict between spouses more consistently than the other contraceptive methods examined. Wives who used oral contraceptive pills were more likely to experience increased levels of disagreement with their husbands (as reported by both wives and husbands) and increased incidences of domestic violence against them (as reported by wives). This could be caused by the pill generating psychological costs. In stark contrast to sterilization, a one-time procedure commonly used in Nepal for stopping childbearing, the newly available pill requires regular visits to health clinics to obtain refills and daily effort to remember to take it. The burden of sustained use of the pill may cause anxiety and marital strain, which may manifest in increased disagreement or physical abuse. These effects could also be the result of role conflict brought on by the pill's empowering effect on women. Husbands may feel threatened if the pill enables their wives to move into male spheres of employment, especially if the husbands still want to continue childbearing. Husbands may display their masculinity via arguments and violence as retaliation. The FDA approval of the pill in the United States in the 1960s

was a cultural phenomenon associated with females gaining power in gender relations (Steinem 1994; Tone 2001). At this time it was speculated that the pill could create psychological problems for men (Tone 2001). Perhaps a similar cultural phenomenon is on the rise in present day Nepal.

This research contributes to the small but needed literature using longitudinal data to disentangle the temporal order of domestic violence and contraceptive adoption. Although results from this analysis indicate that contraceptive use may precipitate being beaten by a husband, this does not invalidate the potential two-way relationship between contraception and domestic violence. More research using longitudinal data and in-depth interviews will contribute to a better understanding of the mechanisms explaining this complex interrelationship.

The findings demonstrated here have important policy implications. Researchers in sub-Saharan Africa have often suggested that administrators of family planning programs have taken it for granted that women play the primary role in making contraceptive decisions, and that this neglect of men and marital interactions has hampered the programs' abilities to increase contraceptive prevalence and reduce fertility levels (Mbizvo and Adamchak 1991; Ezeh 1993; Salway 1994). In the South Asian region, high fertility persists despite longstanding goals of postponing childbearing and reducing total fertility in order to ease overpopulation and poverty. A growing literature suggests that the neglect of men's roles in contraceptive behavior could perhaps be limiting the success of family planning programs in South Asia as well (Mahmood and Ringheim 1997; Sharan and Valente 2002). Family planning programs that are designed to help women by encouraging contraceptive use should acknowledge that these

contraceptive behaviors may strain marital relations and create conflicts with husbands. It appears that in this setting, policies aimed at promoting contraceptive adoption and continuation should take measures to minimize the adverse consequences of contraceptives for marital relationships and provide social support for women who experience spousal conflict as a result of using contraceptives.

The Chitwan Valley is a setting of rapid social change. This chapter has investigated directly only one aspect of this dramatic social change – contraceptive use – and its influence on marital dynamics. The observed impacts of contraceptive use suggest that investigation of other aspects of the dramatic social change occurring in the setting and their consequences for family relationships will be fruitful avenues for future research. Broader social changes, such as new living arrangements, employment opportunities outside of the home, or exposure to different sources of Western media, are likely to have implications for marital relationships or other close family relationships in the future. Researchers should consider the full breadth of consequences of these social changes for a comprehensive understanding of the relationship between social change and the family in this setting.

Moreover, a clear trend of increasing contraceptive use with each younger cohort has emerged in the Chitwan Valley (see Chapter 2). There are good reasons to expect that the model of causation between contraceptive use and change in the marital dynamics examined here can be extended to other types of changes in romantic relationships. Further will research will be needed to investigate the extent to which contraception helps to reshape the meaning of romantic relationships in this setting and whether contraceptive use becomes associated with new types of relationship behaviors such as premarital sex,

premarital cohabitation, or marriages ending in divorce. As contraception spreads worldwide, it will be important to document the transformative power of contraception in developing countries and how it reshapes family relationships in the long term.

Table 6.1. Means and Standard Deviations of Variables Used in the Analyses

	Women (N=566)				Men (N=313)			
	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.
Marital Dynamics in 2008								
Frequency of Disagreement	1.97	0.66	1	3	1.97	0.59	1	3
Ever Beaten by Spouse	0.16	0.37	0	1	n/a	n/a	n/a	n/a
Love for Spouse	2.19	0.69	1	3	2.09	0.65	1	3
Contraceptive Use 1997 to 2007								
Oral Contraceptive Pill	0.20	0.40	0	1	0.19	0.39	0	1
Depo-Provera	0.41	0.49	0	1	0.43	0.50	0	1
Female Sterilization	0.10	0.30	0	1	0.10	0.29	0	1
Male Sterilization	0.31	0.46	0	1	0.38	0.49	0	1
Control Variables								
Background Characteristics:								
Highly Educated	0.32	0.47	0	1	0.48	0.50	0	1
Either Parent Ever Went to School	0.38	0.49	0	1	0.28	0.45	0	1
Age 15 to 24 in 1996	0.59	0.49	0	1	0.26	0.44	0	1
Age 25 to 34 in 1996	0.41	0.49	0	1	0.74	0.44	0	1
Marital Experiences:								
Any Participation in Choosing Spouse	0.36	0.48	0	1	0.67	0.47	0	1
Number of Children Born by 1996	1.79	1.43	0	6	1.81	1.41	0	6
Frequency of Disagreement in 1996	1.81	0.65	1	3	1.80	0.66	1	3
Ever Beaten by Spouse in 1996	0.12	0.33	0	1	n/a	n/a	n/a	n/a
Love for Spouse in 1996	2.04	0.69	1	3	2.03	0.70	1	3
Ethnic Group:								
Upper Caste Hindu	0.44	0.50	0	1	0.41	0.49	0	1
Lower Caste Hindu	0.11	0.31	0	1	0.12	0.33	0	1
Newar	0.06	0.23	0	1	0.06	0.24	0	1
Hill Tibeto-Burmese	0.17	0.37	0	1	0.13	0.34	0	1
Terai Tibeto-Burmese	0.23	0.42	0	1	0.28	0.45	0	1

Table 6.2. Ordered Logistic Regression Estimates of the Effects of Contraceptive Use on Change in Frequency of Disagreement with Spouse from 1996 to 2008 (Women's Reports)

	Model 1	Model 2	Model 3	Model 4
Contraceptive Use 1997 to 2007				
Oral Contraceptive Pill	1.48†			
	(1.76)			
Depo-Provera		1.78**		
		(3.01)		
Female Sterilization			0.70	
			(-1.27)	
Male Sterilization				1.09
				(0.48)
Control Variables				
Background Characteristics:				
Highly Educated	1.04	0.97	1.02	1.04
	(0.18)	(-0.16)	(0.09)	(0.20)
Either Parent Ever Went to School	0.74	0.83	0.79	0.80
	(-1.58)	(-0.94)	(-1.27)	(-1.20)
Age 15 to 24 in 1996[a]	0.80	0.87	0.86	0.84
	(-1.10)	(-0.63)	(-0.80)	(-0.86)
Marital Experiences:				
Any Participation in Choosing Spouse	1.06	1.17	1.21	1.20
	(0.29)	(0.77)	(1.04)	(1.02)
Number of Children Born by 1996	0.87*	0.91	0.88†	0.88†
	(-2.00)	(-1.28)	(-1.78)	(-1.86)
Frequency of Disagreement in 1996	1.93***	1.91***	1.85***	1.85***
	(4.82)	(4.58)	(4.71)	(4.70)
Ethnic Group:[b]				
Lower Caste Hindu	2.14*	1.81†	2.25**	2.24**
	(2.41)	(1.78)	(2.69)	(2.67)
Newar	1.70	1.54	1.47	1.50
	(1.36)	(1.04)	(1.06)	(1.10)
Hill Tibeto-Burmese	1.32	1.16	1.31	1.35
	(1.01)	(0.51)	(1.05)	(1.16)
Terai Tibeto-Burmese	1.49	1.50	1.47	1.43
	(1.63)	(1.58)	(1.61)	(1.52)
N	529	487	566	566
-2 Log-Likelihood	989	904	1070	1071

Note: Numbers in parentheses are t-ratios

[a] Reference Group is Age 25 to 34 in 1996

[b] Reference Group is Upper Caste Hindu

†p<.10; *p<.05; **p<.01; ***p<.001 (two-tailed tests)

Table 6.3. Ordered Logistic Regression Estimates of the Effects of Contraceptive Use on Change in Frequency of Disagreement with Spouse from 1996 to 2008 (Men's Reports)

	Model 1	Model 2	Model 3	Model 4
Contraceptive Use 1997 to 2007				
Oral Contraceptive Pill	2.09*			
	(2.23)			
Depo-Provera		1.42		
		(1.32)		
Female Sterilization			0.60	
			(-1.22)	
Male Sterilization				1.40
				(1.35)
Control Variables				
Background Characteristics:				
Highly Educated	0.59†	0.73	0.65	0.69
	(-1.75)	(-1.03)	(-1.45)	(-1.29)
Either Parent Ever Went to School	1.49	1.43	1.64†	1.66†
	(1.37)	(1.20)	(1.76)	(1.81)
Age 15 to 24 in 1996[a]	0.70	0.74	0.71	0.68
	(-1.14)	(-0.91)	(-1.12)	(-1.23)
Marital Experiences:				
Any Participation in Choosing Spouse	0.90	0.94	0.87	0.87
	(-0.42)	(-0.22)	(-0.56)	(-0.53)
Number of Children Born by 1996	0.82†	0.82†	0.78*	0.77**
	(-1.96)	(-1.92)	(-2.48)	(-2.64)
Frequency of Disagreement in 1996	2.37***	2.29***	2.51***	2.50***
	(4.35)	(4.04)	(4.74)	(4.72)
Ethnic Group:[b]				
Lower Caste Hindu	1.08	1.11	1.26	1.33
	(0.18)	(0.21)	(0.55)	(0.66)
Newar	3.03*	2.96†	2.86*	2.93*
	(2.00)	(1.89)	(2.00)	(2.04)
Hill Tibeto-Burmese	1.54	1.77	1.89	2.01†
	(1.07)	(1.32)	(1.62)	(1.76)
Terai Tibeto-Burmese	1.78	1.78	2.05*	2.04*
	(1.64)	(1.60)	(2.07)	(2.06)
N	294	277	313	313
-2 Log-Likelihood	479	454	510	510

Note: Numbers in parentheses are t-ratios

[a] Reference Group is Age 25 to 34 in 1996

[b] Reference Group is Upper Caste Hindu

†p<.10; *p<.05; **p<.01; ***p<.001 (two-tailed tests)

Table 6.4. Logistic Regression Estimates of the Effects of Contraceptive Use on Change in Ever Beaten by Spouse from 1996 to 2008 (Women's Reports)

	Model 1	Model 2	Model 3	Model 4
Contraceptive Use 1997 to 2007				
Oral Contraceptive Pill	1.87*			
	(2.04)			
Depo-Provera		1.43		
		(1.36)		
Female Sterilization			0.92	
			(-0.22)	
Male Sterilization				1.07
				(0.27)
Control Variables				
Background Characteristics:				
Highly Educated	0.86	0.85	0.95	0.96
	(-0.45)	(-0.47)	(-0.16)	(-0.14)
Either Parent Ever Went to School	0.55*	0.54*	0.57†	0.57†
	(-2.00)	(-2.01)	(-1.96)	(-1.94)
Age 15 to 24 in 1996[a]	0.87	1.02	0.95	0.93
	(-0.46)	(0.06)	(-0.20)	(-0.24)
Marital Experiences:				
Any Participation in Choosing Spouse	1.07	1.16	1.13	1.13
	(0.23)	(0.53)	(0.46)	(0.46)
Number of Children Born by 1996	1.03	1.07	1.03	1.03
	(0.26)	(0.70)	(0.32)	(0.28)
Ever Beaten by Spouse in 1996	4.14***	3.50***	3.48***	3.50***
	(4.61)	(3.88)	(4.24)	(4.25)
Ethnic Group:[b]				
Lower Caste Hindu	2.11†	1.70	2.13†	2.15†
	(1.84)	(1.24)	(1.94)	(1.95)
Newar	2.03	2.32	2.32†	2.32†
	(1.37)	(1.63)	(1.80)	(1.81)
Hill Tibeto-Burmese	0.60	0.64	0.79	0.80
	(-1.14)	(-0.97)	(-0.57)	(-0.53)
Terai Tibeto-Burmese	1.37	1.43	1.50	1.50
	(0.92)	(1.01)	(1.21)	(1.21)
N	529	487	566	566
-2 Log-Likelihood	419	400	461	461

Note: Numbers in parentheses are t-ratios

[a] Reference Group is Age 25 to 34 in 1996

[b] Reference Group is Upper Caste Hindu

†p<.10; *p<.05; **p<.01; ***p<.001 (two-tailed tests)

Table 6.5. Ordered Logistic Regression Estimates of the Effects of Contraceptive Use on Change in Love for Spouse from 1996 to 2008 (Women's Reports)

	Model 1	Model 2	Model 3	Model 4
Contraceptive Use 1997 to 2007				
Oral Contraceptive Pill	0.87			
	(-0.64)			
Depo-Provera		1.16		
		(0.80)		
Female Sterilization			1.06	
			(0.22)	
Male Sterilization				1.68**
				(2.86)
Control Variables				
Background Characteristics:				
Highly Educated	1.26	1.17	1.26	1.26
	(1.08)	(0.73)	(1.11)	(1.12)
Either Parent Ever Went to School	1.12	1.13	1.12	1.17
	(0.59)	(0.61)	(0.61)	(0.85)
Age 15 to 24 in 1996[a]	1.38	1.48†	1.29	1.19
	(1.60)	(1.82)	(1.32)	(0.88)
Marital Experiences:				
Any Participation in Choosing Spouse	0.95	0.89	0.98	0.98
	(-0.31)	(-0.61)	(-0.11)	(-0.13)
Number of Children Born by 1996	0.94	0.95	0.95	0.94
	(-0.83)	(-0.77)	(-0.69)	(0.98)
Love for Spouse in 1996	1.72***	1.70***	1.77***	1.73***
	(4.20)	(3.99)	(4.56)	(4.37)
Ethnic Group:[b]				
Lower Caste Hindu	0.76	0.72	0.77	0.85
	(-0.90)	(-1.04)	(-0.92)	(-0.56)
Newar	0.96	1.18	1.02	1.00
	(-0.12)	(0.41)	(0.06)	(0.00)
Hill Tibeto-Burmese	0.95	0.71	0.91	1.00
	(-0.18)	(-1.24)	(-0.37)	(0.01)
Terai Tibeto-Burmese	0.87	0.75	0.78	0.82
	(-0.58)	(-1.17)	(-1.07)	(-0.88)
N	529	487	566	566
-2 Log-Likelihood	1037	951	1103	1095

Note: Numbers in parentheses are t-ratios

[a] Reference Group is Age 25 to 34 in 1996

[b] Reference Group is Upper Caste Hindu

†p<.10; *p<.05; **p<.01; ***p<.001 (two-tailed tests)

Table 6.6. Ordered Logistic Regression Estimates of the Effects of Contraceptive Use on Change in Love for Spouse from 1996 to 2008 (Men's Reports)

	Model 1	Model 2	Model 3	Model 4
Contraceptive Use from 1997 to 2007				
Oral Contraceptive Pill	0.61			
	(-1.58)			
Depo-Provera		0.73		
		(-1.24)		
Female Sterilization			1.55	
			(1.09)	
Male Sterilization				0.84
				(-0.76)
Control Variables				
Background Characteristics:				
Highly Educated	0.92	0.91	1.03	1.00
	(-0.28)	(0.31)	(0.11)	(0.01)
Either Parent Ever Went to School	1.17	1.24	1.16	1.15
	(0.57)	(0.77)	(0.57)	(0.51)
Age 15 to 24 in 1996[a]	0.57†	0.54*	0.59†	0.60†
	(-1.88)	(-1.98)	(-1.79)	(-1.72)
Marital Experiences:				
Any Participation in Choosing Spouse	1.49	1.33	1.36	1.34
	(1.58)	(1.10)	(1.24)	(1.20)
Number of Children Born by 1996	0.81*	0.81*	0.83*	0.84†
	(-2.18)	(-2.09)	(-2.05)	(-1.91)
Love for Spouse in 1996	2.74***	2.80***	2.84***	2.79***
	(5.58)	(5.59)	(5.93)	(5.85)
Ethnic Group:[b]				
Lower Caste Hindu	2.04†	2.34†	1.83	1.80
	(1.69)	(1.85)	(1.48)	(1.43)
Newar	0.63	0.66	0.60	0.58
	(-0.88)	(-0.78)	(-1.05)	(-1.11)
Hill Tibeto-Burmese	0.62	0.63	0.68	0.66
	(-1.22)	(-1.14)	(-1.05)	(-1.13)
Terai Tibeto-Burmese	0.90	0.85	0.80	0.82
	(-0.32)	(-0.48)	(-0.67)	(-0.62)
N	294	277	313	313
-2 Log-Likelihood	528	496	557	558

Note: Numbers in parentheses are t-ratios

[a] Reference Group is Age 25 to 34 in 1996

[b] Reference Group is Upper Caste Hindu

†p<.10; *p<.05; **p<.01; ***p<.001 (two-tailed tests)

CHAPTER 7

CONCLUSION

Introduction

The aim of this dissertation has been to investigate how relationship dynamics between wives and their husbands' families are intricately linked to childbearing behavior in Nepal, a society undergoing dramatic social and demographic change. I have focused on dynamics of two relationships that are fundamental to the Nepalese kinship system: the husband/wife relationship and the mother-in-law/daughter-in-law relationship. The results expand our understanding of family dynamics and childbearing behavior, and have important implications for social theories, policies, and future research.

In this concluding chapter I first comment on some limitations of these analyses. I then briefly summarize the important findings of each of the substantive chapters. Finally, I close by discussing some of the broadest conclusions from this dissertation as a whole.

Limitations

Before I discuss prominent specific results and implications of these results, there are two challenges faced in this dissertation that warrant comment. The first is the ability to make causal inferences based on the results and the second is the use of unproven

measures of emotions in close relationships in empirical models. Below I briefly summarize these challenges and how I address them.

Endogeneity. As with most social science research, the ability to make causal inferences is limited because the results are based on observational study design. Wives are not randomly assigned into husbands' households. So, as an example, the findings observed in Chapter 6 may appear because wives who are most likely to use contraceptives may also have a high preceding propensity to have conflict with their husbands.

I attempt to minimize the chances that the observed results are due to endogeneity by using several methodological strategies. First, I exploit the temporal ordering embedded in the data to help establish the direction of association. So, to use Chapter 6 again as an example, the first contraceptive use occurs in between the measures of marital dynamics at two time points, helping to demonstrate that contraceptive use may cause a change in the marital dynamic from time one to time two. Second, I include extensive controls for a wide range of characteristics of the wives' backgrounds and the spouses' marital relationships that may influence both wives' relationships with their affinal family and their childbearing behavior. While of course there is an infinite number of omitted variables, for parsimony the analyses presented here include controls only for factors that are theoretically relevant. Third, I compare cases included in the analysis samples to similar cases that are excluded from the analysis samples to investigate how sensitive estimates may be to endogeneity issues. In the event that I find a significant difference in a certain characteristic such as education or ethnicity between the analysis sample and excluded cases, I comment on the potential for selection bias to be

introduced. However, for the most part I find that excluded cases are comparable to the analysis samples. Thus I conclude that the threat of endogeneity bias for conclusions based on these results is minimal.

Measuring Emotions in Close Relationships. Because this analysis uses subjective measures of emotions about close relationships, conclusions from these analyses may be threatened if these measures do not capture the intended concepts. In particular, two of the measures used in this dissertation – the measure of mother-in-law relationship happiness and the measure of spousal love – are innovative and unproven in the established literature. Because measures of emotions in relationship dynamics are largely missing from the understanding of demographic behaviors, three years of unstructured ethnographic interviewing, cognitive interviewing, and repeated pilot testing went into refining these measures before they were administered in the 1996 baseline survey. To provide further justification of the construct validity of these measures, I examine correlations between these measures and other measures which I expect them to converge with. I find that both measures of relationship happiness and love correlate with other measures reflecting their expected characteristics. For example, married respondents' reports of spousal love are negatively correlated with having experienced domestic abuse, and are positively correlated with their having ever listened to the radio, watched a movie, and watched television (for the full description of this analysis see Chapter 3). These findings are sensible because in many settings outside the West exposure to mass media such as radio, movies, and television is likely to promote the diffusion of Western cultural ideas about love and marriage, by romanticizing the nuclear family with its strong conjugal bond (Hornik and McAnany 2001; Barber and Axinn

2004). Incorporating these measures of love and relationship happiness into research on childbearing behavior is a useful first step toward filling the gap in research on emotions and demographic behaviors.

Findings

At the end of each of the three analytic chapters I provide a detailed discussion of that chapter's specific findings and implications. Below, I provide a very brief review of each of the analytic chapters.

Chapter 4. In Chapter 4 I examine how household co-residence with a mother-in-law affects subsequent childbearing behavior. I test two aspects of childbearing behavior, pregnancy and permanent contraceptive use, as dependent variables. This chapter benefits from a prospective study design. I exploit monthly measures of pregnancy and contraceptive use, which are linked to baseline measures of mother-in-law co-residence, to conduct an event-history analysis. Results highlight the important independent role played by extended family structure in childbearing behavior. Results support the hypothesis that the experience of living with a mother-in-law increases subsequent pregnancy. However, these results are only pronounced among women who have not yet had children. This effect may be explained by new wives' motivation to improve their status in their husbands' household through childbearing. Upon proving their fertility the first time, pressure for new wives to attain status may not be as intense. However, other intervening mechanisms may also be at work. Results provide some support for the hypothesis that living with a mother-in-law decreases subsequent contraceptive use. Although I find a negative influence of co-residence on the use of Depo-Provera, I find no effect of co-residence on the likelihood of a women or her husband getting sterilized.

Chapter 5. Chapters 5 and 6 demonstrate that childbearing behaviors can be a determinant of family relationship dynamics. Far less research attention has been paid to this direction of influence, compared to research on relationship dynamics as a determinant of childbearing behaviors. Chapter 5 provides evidence that childbearing is related to women's perceptions of happiness in relationships with their mothers-in-law. The chapter entails both cross-sectional and longitudinal analyses investigating this issue. Results of the cross-sectional analysis support the hypothesis that among wives, the more children they have borne the happier they perceive the relationship with their mothers-in-law. Furthermore, I find that bearing sons has an even stronger association with wives' reports of relationship happiness, whereas bearing daughters has no association. These results are fitting given that in this setting sons have more value to a mother-in-law relative to daughters. Bearing sons is likely to increase wives' status in their relationship with their mothers-in-law, which will increase the wives' level of positive sentiment about this relationship. Results of the longitudinal analysis indicate that childbearing may promote wives to report more relationship happiness with their mothers-in-law over time. However, most of the models in this analysis were unable to demonstrate statistically significant effects. This may be due to the small number of cases that met the criteria to be included in the longitudinal analysis sample, to the infrequency of childbearing during the time between interviews, or to the consistency over time of wives' perceptions of their relationships with their mothers-in-law.

Chapter 6. Results of Chapter 6 point to contraceptive use as a potentially important factor in marital relationship dynamics. This chapter benefits from measures of marital dynamics at two time points, as well as measures of contraceptive use between

these two time points. This longitudinal design helps to yield stronger inferences about contraceptive use causing change in marital dynamics over time. I examine a variety of contraceptive methods: oral contraceptive pills, Depo-Provera, and both female and male sterilization. I also test change in several marital relationship dynamics: disagreement, domestic violence, and love. The pattern of effects of using oral contraceptive pills is clear and consistent. Pill use is related to both husbands and wives reporting increased levels of disagreement, and wives reporting increased levels of domestic violence. Depo-Provera is also related to wives reporting increased levels of disagreement. Thus in this setting, contraceptive use seems to have more costs than benefits for marital relationships, especially the newly available pill. In these models, variation in marital dynamics in 1996 explains a great deal of variation in marital dynamics in 2008. Therefore, the significant effects of contraceptive use that are found in this chapter highlight the fact that contraceptive use may influence change in marital dynamics from one time point to another.

Overall Conclusions

The key point that the reader should take away from this dissertation is the importance of integrating interpersonal processes into empirical research on childbearing behavior. Empirical social science research on fertility has historically focused exclusively on women; however, these analyses demonstrate that women's relationships with their husbands and mothers-in-law are intricately related to their childbearing behavior. I investigate the links between childbearing and characteristics of these relationships such as co-residence and domestic violence, and emotions in these relationships such as happiness and love. I document reciprocal effects, first showing

how family structure influences childbearing behavior, and then showing how childbearing behavior plays a part in the changing nature of wives' relationships with their husbands and mothers-in-law. Family formation behaviors like marriage, birth, and contraceptive use – staples of family demography – tend to be perceived as events rather than prolonged and dynamic processes of interpersonal relationships. To better understand how demographic choices are made, future theoretical work and empirical research should engage with the complexities of relationship dynamics, and the mechanisms through which these dynamics are related to demographic outcomes.

Most research on intergenerational/spousal relationships and family formation comes from European and American populations and focuses on the parental family. This dissertation takes a step toward filling a substantial gap in the literature by providing empirical examples of the interrelationship of family dynamics and fertility in a non-Western context. Based on knowledge of marriage and family patterns in the context of the Chitwan Valley, this research emphasizes understanding the husband's family as an important social unit in which family formation occurs. This is because in this setting affinal relations are extremely relevant to women's family and demographic behaviors. Based on these findings, we may want to investigate similar relationships in the United States. For instance, the consequences of fertility limitation behaviors such as contraception or abortion for relationship dynamics of dating, cohabiting, or married couples may be fruitful areas for future research. However, before this work could be undertaken, our theory would need to be adjusted to account for characteristics specific to the United States context.

A better understanding of the dimensions of family dynamics most strongly related to childbearing behavior is essential for informing policies which aim to increase contraceptive use and lower fertility. Although these analyses focus on a population in rural Nepal, findings from this research may be applicable to other regions facing pressing overpopulation and poverty issues. These results may be particularly relevant to nearby regions of South Asia, including Northern India, Bangladesh, and Pakistan, where family life is similar to that in Nepal.

A major policy implication derived from this research is the increased inclusion of extended family members in the family planning process. A growing literature suggests that the neglect of husbands' roles in contraceptive behavior could perhaps be preventing the South Asian region from attaining goals of reduced fertility (Mahmood and Ringheim 1997; Sharan and Valente 2002). This dissertation demonstrated that contraceptive use, particularly use of the oral contraceptive pill, may create conflict with husbands. Therefore, policies aimed at providing women with information about the pill to transmit to their husbands could potentially increase their propensity to initiate and continue use of the pill. Programs could also provide support or counseling for couples whose marital relationships are strained as a result of using contraceptives. Furthermore, this research suggests that husbands are not the only family member who should be integrated into family planning programs. Information promoting family planning should also directly target mothers-in-law, especially if they are living in the same household as their daughters-in-law, which is extremely common in this region. This research showed that mothers-in-law are a key figure involved in wives' childbearing behavior. Co-residence with a mother-in-law increases the pace of first pregnancy, and childbearing is associated

with happier relationships between wives and mothers-in-law. Educating mothers-in-law about family planning and involving them in discussions of family planning may be useful policy tools for achieving fertility goals which have thus far not been met.

More generally, this analysis should motivate greater attention to emotions in social demographic research. In attempting to understand human behavior and demographic outcomes, sociologists tend to focus on rationality rather than emotionality (Basu 2006; Massey 2002). In his Presidential Address to the American Sociological Association, Massey described why failing to theorize about emotions and their interactions with rational cognition may yield fundamental misunderstandings about human social behavior (Massey 2002). Throughout human evolution, rationality has not replaced emotionality as the basis for human interaction; rather, it was gradually added to a preexisting emotional foundation. Over millions of years humans developed different areas of the brain for emotional impulses and rational cognition. Furthermore, the emotional area of the brain perceives, evaluates, and acts upon incoming stimuli before the rational area of the brain has even received the stimuli (LeDoux 1996). Moreover, many more neural pathways carry information from the emotional area of the brain to the rational area of the brain than in the other direction. For these reasons it is much more likely that emotional impulses will dominate or condition our rational cognition than vice versa. Thus instead of choosing one over the other, we should focus on the interplay between rationality and emotionality in both our theory and models. In this dissertation I investigate the links between childbearing and emotions such as mother-in-law relationship happiness and spousal love. This work includes only a tiny subset of all the possible emotions that could be measured. Investment in more measures of emotions

should be a high priority for social demographic surveys. Furthermore, engagement with emotionality could be broadened to understanding other demographic processes such as migration, urbanization, and mortality. Although it will be a challenging undertaking, incorporating these measures into empirical research is likely to pay off with a more profound and thorough understanding of demographic behaviors.

In addition to data collection efforts striving to improve measures of emotions, another step that researchers can take to build on this dissertation is to examine other close relationships and their links to childbearing behaviors. This dissertation investigates only husbands and mothers-in-law. These results are only a starting point for such empirical investigations into the connections between close personal relationships and demographic behaviors. There is good reason to believe that in this setting, neighbors may represent important personal relationships that are salient to individuals' childbearing behaviors. In this setting the immediate neighborhood is likely to have substantial meaning in people's lives, because neighborhoods contain a group of people who know each other and interact face-to-face every day (Axinn and Yabiku 2001). Recent research using the Chitwan Valley Family Study demonstrates that neighbors' attitudes about marriage influence individuals' marriage behaviors, even when controlling for structural properties of the neighborhood (Yabiku 2006). Because neighborhoods in Chitwan entail a close social network, it may be reasonable for future research to conceptualize neighbors as close relations who define the context for reproduction. Developing a more theoretically rich understanding of close personal relationships may yield deeper insights into demographic behaviors in this setting.

Finally, as daily activities have become organized outside of the family, opportunities for youth to interact socially have increased in this setting (Ghimire et al. 2006). Spending more time in shared experiences outside the home, such as at school, work, movie theaters, or youth clubs, may foster close bonds among youth. Although the family is likely to remain an important social context for childbearing behaviors, friends or peers may become more influential in individuals' lives. Thus social demographic researchers may want to consider friends or peers as close personal relations and investigate how dynamics of these relationships are interconnected with childbearing behavior.

BIBLIOGRAPHY

Adler, L.L., F.L. Denmark, and R.A. Ahmed. 1989. "Attitudes Toward Mother-in-Law and Stepmother: A Cross-Cultural Study." *Psychological Reports* 65:11-94.

Ahearn, L.M. 2001. *Invitations to Love: Literacy, Love Letters, and Social Change in Nepal*. Ann Arbor: The University of Michigan Press.

Allison, P.D. 1982. "Discrete-Time Methods for the Analysis of Event Histories." *Sociological Methodology* 13:61-98.

—. 1984. *Event History Analysis*. Newbury Park, CA: Sage Publications, Inc.

—. 1999. *Logistic Regression Using the SAS System: Theory and Application*. Cary, NC: SAS Institute Inc.

Amato, P.R., D.R. Johnson, A. Booth, and S.J. Rogers. 2003. "Continuity and Change in Marital Quality Between 1980 and 2000." *Journal of Marriage and Family* 65(1):1-22.

Antonucci, T.C., J.S. Jackson, and S. Biggs. 2007. "Intergenerational Relations: Theory, Research, and Policy." *Journal of Social Issues* 63(4):679-693.

Apter, T. 1986. Loose Relations: *Your In-laws and You*. London: Macmillan Press.

Avan, B.I. and S. Akhund. 2006. "Role of Family Type in the Idealization of a Larger Number of Children by Husbands in Pakistan." *Journal of Biosocial Science* 38(2):203-220.

Axinn, W.G. 1992. "Family Organization and Fertility Limitation in Nepal." *Demography* 29(4):503-521.

—. 1993. "The Effects of Children's Schooling on Fertility Limitation." *Population Studies* 47(3):481-493.

Axinn, W.G. and J.S. Barber. 1997. "Living Arrangements and Family Formation Attitudes in Early Adulthood." *Journal of Marriage and Family* 59(3):595-611.

—. 2001. "Mass Education and Fertility Transition." *American Sociological Review* 66(4):481-505.

Axinn, W.G., L.D. Pearce, and D.J. Ghimire. 1999. "Innovations in Life History Calendar Applications." *Social Science Research* 28(3):243-264.

Axinn, W.G. and S.T. Yabiku. 2001. "Social Change, the Social Organization of Families, and Fertility Limitation." *American Journal of Sociology* 106(5):1219-1261.

Bahr, H.M. and B.A. Chadwick. 1988. "Religion and Family in Middletown, USA." Pp. 51-65 in *The Religion and Family Connection: Social Science Perspectives*, edited by D.L. Thomas. Provo, UT: Religious Studies Center, Brigham Young University.

Barber, J.S. 2000. "Intergenerational Influences on the Entry into Parenthood: Mothers' Preferences for Family and Nonfamily Behavior." *Social Forces* 79(1):319-348.

Barber, J.S., S.A. Murphy, W.G. Axinn, and J. Maples. 2000. "Discrete-Time Multilevel Hazard Analysis." *Sociological Methodology* 30(1):201-235.

Barber, J.S. and W.G. Axinn. 2004. "New Ideas and Fertility Limitation: The Role of Mass Media." *Journal of Marriage and Family* 66(5):1180-1200.

Basu, A.M. 2006. "The Emotions and Reproductive Health." *Population and Development Review* 32(1):107-121.

Bawah, A.A., P. Akweongo, R. Simmons, and J.F. Phillips. 1999. "Women's Fears and Men's Anxieties: The Impact of Family Planning on Gender Relations in Northern Ghana." *Studies in Family Planning* 30(1):54-66.

Beckman, L.J. 1983. "Communication, Power, and the Influence of Social Networks in Couple Decisions on Fertility." Pp. 415-443 in *Determinants of Fertility in Developing Countries*, edited by R.A. Bulatao and R.D. Lee. New York: Academic Press.

Belsky, J., M.E. Lang, and M. Rovine. 1985. "Stability and Change in Marriage across the Transition to Parenthood: A Second Study." *Journal of Marriage and Family* 47(4):855-865.

Ben-Akiva, M.E. and S.R. Lerman. 1987. *Discrete Choice Analysis: Theory and Application to Travel Demand*. Cambridge: MIT Press.

Bennett, L. 1983. *Dangerous Wives and Sacred Sisters: Social and Symbolic Roles of High-Caste Women in Nepal*. New York: Columbia University Press.

Banerjee, Sir Gooroodass. 1984. *The Hindu Law of Marriage and Stridhana*. 4th ed. Delhi: Mittal.

Berreman, G.D. 1972. *Hindus of the Himalayas: Ethnography and Change*. Berkeley: University of California Press.

Berscheid, E. and H.T. Reis. 1998. "Attraction and Close Relationships." Pp. 193-281 in *The Handbook of Social Psychology*, edited by D.T. Gilbert, S.T. Fiske, and G. Lindzey. New York: McGraw-Hill.

Beutel, A., and W.G. Axinn. 2002. "Social Change, Gender, and Educational Status Attainment." *Economic Development and Cultural Change* 51(1):109-134.

Biddlecom, A.E. and B.M. Fapohunda. 1998. "Covert Contraceptive Use: Prevalence, Motivations, and Consequences." *Studies in Family Planning* 29(4):360-372.

Bista, D.B. 1991. *Fatalism and Development: Nepal's Struggle for Modernization*. Calcutta: Orient Longman Limited.

Blanc, A.K. 2001. "The Effect of Power in Sexual Relationships on Sexual and Reproductive Health: An Examination of the Evidence." *Studies in Family Planning* 32(3):189-213.

Blau, P.M. 1964. *Exchange and Power in Social Life*. New York: Wiley.

Bongaarts, J. and S.C. Watkins. 1996. "Social Interactions and Contemporary Fertility Transitions." *Population and Development Review* 22:639-682.

Booth, A., D. Johnson, and J.N. Edwards. 1983. "Measuring Marital Instability." *Journal of Marriage and Family* 45(2):387-394.

Bowen, G.L. 1988. "Family Life Satisfaction: A Value-Based Approach." *Family Relations* 37(4):458-462.

Bowlby, J. 1988. *A Secure Base: Parent-Child Attachment and Healthy Human Development*. New York: Basic Books.

Brunson, J. 2010. "Son Preference in the Context of Fertility Decline: Limits to New Constructions of Gender and Kinship in Nepal." *Studies in Family Planning* 41(2):89-98.

Bumpass, L.L. and J.A. Sweet. 1989. "National Estimates of Cohabitation." *Demography* 26(4):615-625.

Cain, M.T. 1977. "The Economic Activities of Children in a Village in Bangladesh." *Population and Development Review* 3 (3):201-227.

Caldwell, J.C. 1982. *Theory of Fertility Decline*. New York: Academic Press.

Caldwell, J.C., G. Immerwahr, and L.T. Ruzicka. 1982. "Illustrative Analysis: Family Structure and Fertility." Pp. 64. Voorburg, Netherlands: International Statistical Institute.

Caldwell, J.C., P.H. Reddy, and P. Caldwell. 1982. "The Causes of Demographic Change in Rural South India: A Micro Approach." *Population and Development Review* 8(4):689-727.

Caldwell, J.C., P.H. Reddy, and P. Caldwell. 1985. "Educational Transition in Rural South India." *Population and Development Review* 11 (1):29-51.

Caldwell, J.C., P.H. Reddy, and P. Caldwell. 1988. *The Causes of Demographic Change: Experimental Research in South India*. Madison: University of Wisconsin Press.

Cameron, M.M. 1998. *On the Edge of the Auspicious: Gender and Caste in Nepal*. Chicago: University of Illinois Press.

Campbell, J.C., L.C. Pugh, D. Campbell, and M. Visscher. 1995. "The Influence of Abuse on Pregnancy Intention." *Women's Health Issues* 5(4):214-223.

Central Bureau of Statistics (CBS). 2002. *Statistical Pocket Book Nepal*. Kathmandu: Central Bureau of Statistics.

Central Bureau of Statistics (CBS). 2003. *Population Monograph of Nepal*. Kathmandu: Central Bureau of Statistics.

Chen, F., S.E. Short, and B. Entwisle. 2000. "The Impact of Grandparental Proximity on Maternal Childcare in China." *Population Research and Policy Review* 19:571-590.

Chi, P.S.K. and P.-L. Hsin. 1996. "Family Structure and Fertility Behavior in Taiwan." *Population Research and Policy Review* 15(4):327-339.

Chibucos, T.R., R.W. Leite, and D.L. Weis. 2005. "Family Systems Theory." In *Readings in Family Theory*. Thousand Oaks, CA: Sage Publications.

Clark, C.J., J.G. Silverman, I.A. Khalaf, B.A. Ra'ad, Z.A.A. Sha'ar, A.A.A. Ata, and A. Batieha. 2008. "Intimate Partner Violence and Interference with Women's Efforts to Avoid Pregnancy in Jordan." *Studies in Family Planning* 39(2):123-132.

Clarkberg, M. 1999. "The Price of Partnering: The Role of Economic Well-Being in Young Adults' First Union Experiences." *Social Forces* 77(3):945-968.

Cook, K.S. 1995. "Introduction: Social Interaction and Social Structure." Pp. 203-208 in *Sociological Perspectives on Social Psychology*, edited by K.S. Cook, G.A. Fine, and J.S. House. Boston: Allyn and Bacon.

Dahal, D.R. 1993. "Rethinking Fertility Transition: Some Observation from Nepal." In *Population Dynamics in Nepal*, Ed. K.C. Bal Kumar. Kathmandu: Tribhuvan University, Central Department of Population Studies, pp. 49-58.

Dastider, M. 1995. *Religious Minorities in Nepal*. New Delhi: Nirala.

Davis, K. 1955. "Institutional Patterns Favoring High Fertility in Underdeveloped Areas." *Eugenics Quarterly* 2:33-39.

D'Angelo, D.V., B.C. Gilbert, R.W. Rochat, J.S. Santelli, and J.M. Herold. 2004. "Differences Between Mistimed and Unwanted Pregnancies Among Women who Have Live Births." *Perspectives on Sexual and Reproductive Health* 36(5):192–197.

Eby, K., J.C. Campbell, C. Sullivan, and W. Davidson. 1995. "Health Effects of Experiences of Sexual Violence for Women with Abusive Partners." *Health Care for Women International* 16(6):563–576.

Ellison, C.G. 1990. "Family Ties, Friendships, and Subjective Well-Being among Black Americans." *Journal of Marriage and Family* 52(2):298-310.

Ellsberg, M., L. Heise, R. Pena, S. Agurto, and A. Winkvist. 2001. "Researching Domestic Violence Against Women: Methodological and Ethical Considerations." *Studies in Family Planning* 32(1):1-16.

Emerson, R.M. 1962. "Power-Dependence Relations." *American Sociological Review* 27(1):31-41.

—. 1972. "Exchange Theory, Part I: A Psychological Basis for Social Exchange" and "Exchange Theory, Part II: Exchange Relations and Networks." Pp. 38-87 in *Sociological Theories in Progress*, edited by J. Berger, J. Zelditch, Morris, and B. Anderson. Boston: Houghton-Mifflin.

Entwisle, B., R.R. Rindfuss, D.K. Guilkey, A. Chamratrithirong, S.R. Curran, and Y. Sawangdee. 1996. "Community and Contraceptive Choice in Rural Thailand: A Case Study of Nang Rong." *Demography* 33(1):1-11.

Ezeh, A.C. 1993. "The Influence of Spouses over each Other's Contraceptive Attitudes in Ghana." *Studies in Family Planning* 24(3):163-174.

Fikree, F.F., A. Khan, M.M. Kadir, F. Sajan, and M.H. Rahbar. 2001. "What Influences Contraceptive Use among Young Women in Urban Squatter Settlements of Karachi, Pakistan?" *International Family Planning Perspectives* 27(3):130-136.

Fincham, F.D. and T.N. Bradbury. 1987. "The Assessment of Marital Quality: A Reevaluation." *Journal of Marriage and Family* 49(4):797-809.

Folmar, S. 1992. "Variation and change in fertility in West Central Nepal." *Human Ecology* 20(2):225-248.

Ford, K., W. Sohn, and J. Lepkowski. 2001. "Characteristics of Adolescents' Sexual Partners and Their Association With Use of Condoms and Other Contraceptive Methods." *Family Planning Perspectives* 33(3):100-105, 132.

Freedman, R., M.-C. Chang, and T.-H. Sun. 1982. "Household Composition, Extended Kinship, and Reproduction in Taiwan: 1973-1980." *Population Studies* 36(3):395-411.

Fricke, T.E. 1986. *Himalayan Households: Tamang Demography and Domestic Processes*. Ann Arbor, MI: UMI Research Press.

Garcia-Moreno, C., H.A.F.M. Jansen, M. Ellsberg, L. Heise, and C. Watts. 2005. "WHO multicountry study on women's health and domestic violence against women: Initial results on prevalence, health outcomes and women's responses." Switzerland: World Health Organization.

Gazmararian, J.A., M.M. Adams, L.E. Saltzman, C.H. Johnson, F.C. Bruce, J.S. Marks, S.C. Zahniser, and T.P.W. Group. 1995. "The Relationship Between Pregnancy Intendedness and Physical Violence in Mothers of Newborns." *Obstetrics and Gynecology* 85:1031- 1038.

Ghimire, D.J. 2003. "The Social Context of First Birth Timing in Nepal." Dissertation, Sociology, The University of Michigan.

Ghimire, D.J., W.G. Axinn, S.T. Yabiku, and A. Thornton. 2006. "Social Change, Premarital Nonfamily Experience, and Spouse Choice in an Arranged Marriage Society." *American Journal of Sociology* 111(4):1181-1218.

Godley, J. 2001. "Kinship Networks and Contraceptive Choice In Nang Rong, Thailand." *International Family Planning Perspectives* 27(1):4-10 & 41.

Goetting, A. 1990. "Patterns of Support Among In-Laws in the United States: A Review of Research." *Journal of Family Issues* 11(1):67-90.

Goode, W.J. 1964. *The Family*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Goodwin, P.Y. 2003. "African American and European American Women's Marital Well-Being." *Journal of Marriage and Family* 65(3):550-560.

Gray, J.N. 1990. "Chetri Women in Domestic Groups and Rituals." Pp. 211-241 in *Women in India and Nepal*, edited by M. Allen and S.N. Mukherjee. New Delhi: Sterling Publishers Private Limited.

Greeley, A. 1991. *Faithful Attractions: Discovering Intimacy, Love and Fidelity in American Marriage*. New York: Tom Doherty.

Gubhaju, B. 2009. "The Influence of Wives' and Husbands' Education Levels On Contraceptive Method Choice in Nepal, 1996-2006." *International Perspectives on Sexual and Reproductive Health* 35(4):176-185.

Guilkey, D.K. and R.R. Rindfuss. 1987. "Logistic Regression Multivariate Life Tables: A Communicable Approach." *Sociological Methods and Research* 16(2):276-300.

Guneratne, U.A. 1994. "The Tharus of Chitwan: Ethnicity, Class and The State in Nepal." Dissertation, Anthropology, The University of Chicago.

—. 1996. "The Tax Man Cometh: The Impact of Revenue Collection on Subsistence Strategies in Chitwan Tharu Society." *Studies in Nepali History and Society* 1:5-35.

Gurung, H.B. 1998. *Nepal Social Demography and Expressions*. Kathmandu: New Era.

Haq, K. 2002. "Human Development in South Asia 2001." Karachi: Mahbub ul Haq Human Development Center (MHDC).

Haq, M. 1997. "Human Development in South Asia." Karachi: Mahbub ul Haq Human Development Center (MHDC).

Harris, G.L., J.A. Giddens, Thomas E. Lux, F.M. Bunge, F.C. Rintz, and H.H. Smith. 1973. *Area Handbook for Nepal, Bhutan, and Sikkim*. Washington: Government Printing Press.

Hekmat, F., R.I. Kabacoff, and H.E. Klein. 1983. "Motivations for Childbearing and Fertility Behavior Among Urban and Rural Families of Iran." *Birth Psychology Bulletin* 4(1):26-39.

Helms-Erickson, H. 2001. "Marital Quality Ten Years After the Transition to Parenthood: Implications of the Timing of Parenthood and the Division of Housework." *Journal of Marriage and Family* 63(4):1099-1110.

Hobcraft, J. 2006. "The ABC of demographic behaviour: How the interplays of alleles, brains, and contexts over the life course should shape research on understanding population processes." *Population Studies* 60(2):153-187.

Hoelter, L.F., W.G. Axinn, and D.J. Ghimire. 2004. "Social Change, Premarital Nonfamily Experiences, and Marital Dynamics." *Journal of Marriage and Family* 66(5):1131-1151.

Hof, C. and A. Richters. 1999. "Exploring Intersections between Teenage Pregnancy and Gender Violence: Lessons from Zimbabwe." *African Journal of Reproductive Health* 3(1):51-65.

Hornik, R. and E. McAnany. 2001. Mass media and fertility change, in J. Casterline (ed.), *Diffusion Processes and Fertility Transition*. Washington: National Academy Press, pp. 208-239.

Howard, M.M., D. Fortenberry, M.J. Blythe, G.D. Zimet, and D.P. Orr. 1999. "Patterns of Sexual Partnerships among Adolescent Females." *Journal of Adolescent Health* 24(5):300-303.

Hunt, R.A. and M.B. King. 1978. "Religiosity and Marriage." *Journal for the Scientific Study of Religion* 17(4):399-406.

Jackson, J. and L. Berg-Cross. 1988. "Extending the Extended Family: The Mother-In-Law and Daughter-In-Law Relationship of Black Women." *Family Relations* 37(3):293-297.

Jain, A., L. Visaria, P. Visaria, and V.P. Shah. 1992. "Impact of Family Planning Program Inputs on Use of Contraceptives in Gujarat State, India." Pp. 24. Ahmedabad, India: Gujarat Institute of Development Research.

Johnson, D.R., L.K. White, J.N. Edwards, and A. Booth. 1986. "Dimensions of Marital Quality: Toward Methodological and Conceptual Refinement." *Journal of Family Issues* 7(1):31-49.

Joshi, P.L. 1995. "Population Policy and Family Planning Programme in Nepal." Kathmandu: Central Bureau of Statistics.

Kadir, M.M., F.F. Fikree, A. Khan, and F. Sajan. 2003. "Do Mothers-in-Law Matter? Family Dynamics and Fertility Decision-Making in Urban Squatter Settlements of Karachi, Pakistan." *Journal of Biosocial Science* 35(4):545-558.

Kalichman, S.C., E.A. Williams, C. Cherry, L. Belcher, and D. Nachimson. 1998. "Sexual Coercion, Domestic Violence and Negotiating Condom Use Among

Low-Income African-American Women." *Journal of Women's Health* 7(3):371–378.

Kanin, E.J. and A.L. Switzer. 1973. "The Application of the General Theory of Selective Needs to In-Law Relationships." *Human Relations* 26(1):23-30.

Karra, M.V., N.N. Stark, and J. Wolf. 1997. "Male Involvement in Family Planning: A Case Study Spanning Five Generations of a South Indian Family." *Studies in Family Planning* 28(1):24-34.

Katz, B.P., D. Fortenberry, G.D. Zimet, M.J. Blythe, and D.P. Orr. 2000. "Partner-Specific Relationship Characteristics and Condom Use Among Young People With Sexually Transmitted Diseases." *Journal of Sex Research* 37(1):69-75.

Kaye, D.K. 2006. "Community Perceptions and Experiences of Domestic Violence and Induced Abortion in Wakiso District, Uganda." *Qualitative Health Research* 16(8):1120-1128.

Kaye, D.K., F.M. Mirembe, G. Bantebya, A. Johansson, and A.M. Ekstrom. 2006. "Domestic Violence as Risk Factor for Unwanted Pregnancy and Induced Abortion in Mulago Hospital, Kampala, Uganda." *Tropical Medicine and International Health* 11(1):90-101.

Kelley, H.H. and J.W. Thibaut. 1978. *Interpersonal Relations: A Theory of Interdependence*. New York: Wiley.

Kemper, T.D. and R. Collins. 1990. "Dimensions of Microinteraction." *American Journal of Sociology* 96(1):32-68.

Kerlinger, F.N. 1979. *Behavioral Research: A Conceptual Approach*. New York: Holt, Rinehart and Winston.

Khandaker, R.I., R.L. Vereecken, and P. Nijs. 2002. "Psychosexual Impacts of Contraception on Partner Relationship." *Sexual and Relationship Therapy* 17(1):31-37.

Kishor, S. and K. Johnson. 2006. "Reproductive Health and Domestic Violence: Are The Poorest Women Uniquely Disadvantaged?" *Demography* 43(2):293-307.

Kmenta, J. 1986. *Elements of Econometrics*. Ann Arbor: The University of Michigan Press.

Koenig, M.A., S. Ahmed, M.B. Hossain, and K.A. Mozumder. 2003. "Women's Status and Domestic Violence in Rural Bangladesh: Individual- and Community-Level Effects." *Demography* 40(2):269-288.

Koenig, M.A., R. Stephenson, S. Ahmed, S.J. Jejeebhoy, and J.C. Campbell. 2006. "Individual and Contextual Determinants of Domestic Violence in North India." *American Journal of Public Health* 96(1):132-138.

Kohler, H.-P. 1997. "Learning in Social Networks and Contraceptive Choice." *Demography* 34 (1):369-383.

Kohler, H.-P., J.R. Behrman, and S.C. Watkins. 2001. "The Density of Social Networks and Fertility Decisions: Evidence from South Nyanza District, Kenya." *Demography* 38(1):43-58.

Kritz, M. 2010. "Malaysia: The Effects Of Family Planning On Marital Disruption In Malaysia." Durham, NC: Family Health International.

Ku, L., F.L. Sonenstein, and J.H. Pleck. 1994. "The Dynamics of Young Men's Condom Use During and Across Relationships." *Family Planning Perspectives* 26(6):246-251.

Kurdek, L.A. 1999. "The Nature and Predictors of the Trajectory of Change in Marital Quality for Husbands and Wives Over the First 10 Years of Marriage." *Developmental Psychology* 35:1283-1296.

Kusunoki, Y. 2010. "Relationship Dynamics and Contraceptive Use Reported in an Online Weekly Survey: Preliminary Results." Ann Arbor: University of Michigan Population Studies Center Research Report No. 10-703.

Kusunoki, Y. and D.M. Upchurch. 2010. "Contraceptive Method Choice among Youth in the United States: The Importance of Relationship Context." Forthcoming in *Demography*.

Lan, P.-C. 2002. "Subcontracting Filial Piety: Elder Care in Ethnic Chinese Immigrant Families in California." *Journal of Family Issues* 23:812-835.

Landis, J.T. 1960. "Religiousness, Family Relationships, and Family Values in Protestant, Catholic, and Jewish Families." *Journal of Marriage and Family Living* 22:341-343.

Laumann, E.O., J.H. Gagnon, R.T. Michael, and S. Michaels. 1994. *The Social Organization of Sexuality: Sexual Practices in the United States*. Chicago, IL: University of Chicago Press.

Lawler, E.J. 2001. "An Affect Theory of Social Exchange." *The American Journal of Sociology* 107(2):321-352.

Lawler, E.J. and S.R. Thye. 1999. "Bringing Emotions into Social Exchange Theory." *Annual Review of Sociology* 25:217-244.

LeDoux, J. 1996. *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. New York: Simon and Schuster.

Leone, T., Z. Matthews, and G.D. Zuanna. 2003. "Impact and Determinants of Sex Preference in Nepal." *International Family Planning Perspectives* 29(2):69-75.

Lerner, G. 1993. *The Creation of Feminist Consciousness: From the Middle Ages to 1870*. New York: Oxford University Press.

Lewis, R.A. and G.B. Spanier. 1979. "Theorizing About the Quality and Stability of Marriage." Pp. 268-294 in *Contemporary Theories about the Family*, edited by W.R. Burr, R. Hill, F.I. Nye, and I.L. Reiss. New York: Free Press.

Lim, I.-S. 1997. "Korean Immigrant Women's Challenge to Gender Inequality at Home: The Interplay of Economic Resources, Gender, and Family." *Gender & Society* 11:31-51.

Lovaglia, M.J. 1995. "Power and Status: Exchange, Attribution, and Expectation States." *Small Group Research* 26(3):400-426.

Maddala, G.S. 1983. *Limited-Dependent and Qualitative Variables in Econometrics*. London: Cambridge University Press.

Mahmood, N. and K. Ringheim. 1997. "Knowledge, Approval and Communication About Family Planning as Correlates of Desired Fertility Among Spouses in Pakistan." *International Family Planning Perspectives* 23(3):122-129+145.

Majupuria, I., and T. C. Majupuria. 1989. *Marriage Customs in Nepal: Traditions and Wedding Ceremonies among Various Nepalese Ethnic Groups*. Bangkok: Craftsman.

Manlove, J., S. Ryan, and K. Franzetta. 2007. "Contraceptive Use Patterns Across Teens' Sexual Relationships: The Role of Relationships, Partners, and Sexual Histories." *Demography* 44(3):603-621.

Manning, W.D., M.A. Longmore, and P.C. Giordano. 2000. "The Relationship Context of Contraceptive Use at First Intercourse." *Family Planning Perspectives* 32(3):104-110.

Martin, S.L., B. Kilgallen, A.O. Tsui, K. Maitra, K.K. Singh, and L.L. Kupper. 1999. "Sexual Behaviors and Reproductive Health Outcomes: Associations with Wife

Abuse in India." *Journal of the American Medical Association* 282(20):1967-1972.

Massey, D.S. 2002. "A Brief History of Human Society: The Origin and Role of Emotion in Social Life: 2001 Presidential Address." *American Sociological Review* 67(1):1-29.

Mbizvo, M.T. and D.J. Adamchak. 1991. "Family Planning Knowledge, Attitudes, and Practices of Men in Zimbabwe." *Studies in Family Planning* 22(1):31-38.

McDonald, P. 2000. "Gender Equity in Theories of Fertility Transition." *Population and Development Review* 26(3):427-439.

Min, P.G. 1998. *Changes and conflicts: Korean immigrant families in New York*. Boston: Allyn & Bacon.

Ministry of Health and Population (MOHP) [Nepal], New ERA, and Macro International Inc. 2007. *Nepal Demographic and Health Survey 2006*. Kathmandu: Ministry of Health and Population, New ERA, and Macro International Inc.

Molm, L.D. 1991. "Affect and Social Exchange: Satisfaction in Power-Dependence Relations." *American Sociological Review* 56(4):475-493.

Molm, L.D. and K.S. Cook. 1995. "Social Exchange and Exchange Networks." Pp. 209-235 in *Sociological Perspectives on Social Psychology*, edited by K.S. Cook, G.A. Fine, and J.S. House. Boston: Allyn and Bacon.

Molm, L.D., T.M. Quist, and P.A. Wiseley. 1994. "Imbalanced Structures, Unfair Strategies: Power and Justice in Social Exchange." *American Sociological Review* 59(1):98-121.

Montgomery, M.R. and J.B. Casterline. 1996. "Social Influence, Social Learning and New Models of Fertility." *Population and Development Review* 22:151-175.

Ministry of Population and Environment (MOPE). 2000. *Nepal Population Report 2000*. Kathmandu: Ministry of Population and Environment.

Norton, R. 1983. "Measuring Marital Quality: A Critical Look at the Dependent Variable." *Journal of Marriage and Family* 45(1):141-151.

Oppenheimer, V.K., M. Kalmijn, and N. Lim. 1997. "Men's Career Development and Marriage Timing During a Period of Rising Inequality." *Demography* 34(3):311-330.

Pallitto, C.C. and P. O'Campo. 2004. "The Relationship between Intimate Partner Violence and Unintended Pregnancy: Analysis of a National Sample from Colombia." *International Family Planning Perspectives* 30(4):165–173.

—. 2005. "Community Level Effects of Gender Inequality on Intimate Partner Violence and Unintended Pregnancy in Colombia: Testing the Feminist Perspective." *Social Science & Medicine* 60(10):2205-2216.

Pearce, L.D. 2000. "The Multidimensional Impact of Religion on Childbearing Preferences and Behavior in Nepal." Dissertation, Sociology and Demography, The Pennsylvania State University.

Pearce, L.D. and W.G. Axinn. 1998. "The Impact of Family Religious Life on the Quality of Mother-Child Relations." *American Sociological Review* 63(6):810-828.

Petersen, T. 1986. "Estimating Fully Parametric Hazard Rate Models With Time-Dependent Covariates: Use of Maximum Likelihood." *Sociological Methods and Research* 14(3):219-246.

—. 1991. "The Statistical Analysis of Event Histories." *Sociological Methods and Research* 19(3):270-323.

Population Reference Bureau (PRB). 2006. <http://www.prb.org/Countries/Nepal.aspx>

Purwar, M.B., L. Jeyaseelan, U. Varhadpande, V. Motghare, and S. Pimplakute. 1999. "Survey of Physical Abuse During Pregnancy in GMCH, Nagpur, India." *Journal of Obstetrics and Gynecology Research* 25(3):165–171.

Rao, V. 1997. "Wife-Beating in Rural South India: A Qualitative and Econometric Analysis." *Social Science & Medicine* 44(8):1169-1180.

Retherford, R.D. and S. Thapa. 1998. "Fertility Trends in Nepal, 1977-1995." *Contribution to Nepalese Studies* 25(Special Issue):9-58.

—. 2004. "Recent Trends and Components of Change in Fertility in Nepal." *Journal of biosocial science* 36(6):709-734.

Rogers, S.J. and D.D. DeBoer. 2001. "Changes in Wives' Income: Effects on Marital Happiness, Psychological Well-Being, and the Risk of Divorce." *Journal of Marriage and Family* 63(2):458-472.

Rubin, Z. 1970. "Measurement of Romantic Love." *Journal of Personality and Social Psychology* 16(2):265-273.

Rusbult, C.E. and X.B. Arriaga. 2000. "Interdependence in Personal Relationships." Pp. 79-108 in *The Social Psychology of Personal Relationships*, edited by W. Ickes and S. Duck. Chichester, England: John Wiley & Sons Ltd.

Sabatelli, R.M. 1988. "Measurement Issues in Marital Research: A Review and Critique of Contemporary Survey Instruments." *Journal of Marriage and Family* 50(4):891-915.

Saltzman, L.E., C.H. Johnson, B.C. Gilbert, and M.M. Goodwin. 2003. "Physical Abuse around the Time of Pregnancy: An Examination of Prevalence and Risk Factors in 16 States." *Maternal and Child Health Journal* 7(1):31–43.

Salway, S. 1994. "How Attitudes Toward Family Planning and Discussion Between Wives and Husbands Affect Contraceptive Use in Ghana." *International Family Planning Perspectives* 20(2):44-47+74.

Schoen, R., S.J. Rogers, and P.R. Amato. 2006. "Wives' Employment and Spouses' Marital Happiness - Assessing the Direction of Influence Using Longitudinal Couple Data." *Journal of Family Issues* 27(4):506-528.

Schuler, S.R., S.M. Hashemi, and S.H. Badal. 1998. "Men's Violence against Women in Rural Bangladesh: Undermined or Exacerbated by Microcredit Programmes?" *Development in Practice* 8(2):148-157.

Sharan, M. and T.W. Valente. 2002. "Spousal Communication and Family Planning Adoption: Effects of a Radio Drama Serial in Nepal." *International Family Planning Perspectives* 28(1):16-25.

Shih, K.Y. and K. Pyke. 2010. "Power, Resistance, and Emotional Economies in Women's Relationships With Mothers-in-Law in Chinese Immigrant Families." *Journal of Family Issues* 31(3):333-357.

Sikder, M.A.S. 2000. "Practice of Contraceptive Devices Associated with Family Structure in Rural Bangladesh." *South Asian Anthropologist* 21(1):7-14.

Silverman, J.G., M.R. Decker, N.A. Kapur, J. Gupta, and A. Raj. 2007. "Violence against Wives, Sexual Risk and Sexually Transmitted Infection among Bangladeshi Men." *Sexually Transmitted Infections* 83(3):211–215.

Silverstein, J.L. 1990. "The Problem with In-Laws." *Journal of Family Therapy* 14:399-412.

Smith-Lovin, L. 1995. "The Sociology of Affect and Emotion." Pp. 118-148 in *Sociological Perspectives on Social Psychology*, edited by K.S. Cook, G.A. Fine, and J.S. House. Boston: Allyn and Bacon.

Soler, H., D. Quadagno, D.F. Sly, K.S. Riehman, I.W. Eberstein, and e. al. 2000. "Relationship Dynamics, Ethnicity and Condom Use Among Low-Income Women." *Family Planning Perspectives* 32(2):82-88, 101.

South, S.J. 1996. "Mate Availability and the Transition to Unwed Motherhood: A Paradox of Population Structure." *Journal of Marriage and Family* 58(2):265-279.

South, S.J. and K.D. Crowder. 1999. "Neighborhood Effects on Family Formation: Concentrated Poverty and Beyond." *American Sociological Review* 64(1):113-132.

Spanier, G.B. 1976. "Measuring Dyadic Adjustment: New Scales for Assessing the Quality of Marriage and Similar Dyads." *Journal of Marriage and Family* 38(1):15-28.

Sprecher, S. 2001. "Equity and Social Exchange in Dating Couples: Associations with Satisfaction, Commitment, and Stability." *Journal of Marriage and Family* 63(3):599-613.

Stack, C.B. 1974. *All our kin*. New York: Harper & Row.

Stash, S. 1996. "Ideal-family-size and Sex-composition Preferences among Wives and Husbands in Nepal." *Studies in Family Planning* 27(2):107-118.

Stash, S. 1999. "Explanations of Unmet Need for Contraception in Chitwan, Nepal." *Studies in Family Planning* 30(4):267-287.

Steinem, G. 1994. *Moving Beyond Words*. New York: Simon & Schuster.

Steinitz, L.Y. 1980. "Religiosity, Well-Being, and Weltanschauung among the Elderly." *Journal for the Scientific Study of Religion* 19(1):60-67.

Stephenson, R., M.A. Koenig, R. Acharya, and T.K. Roy. 2008. "Domestic Violence, Contraceptive Use, and Unwanted Pregnancy in Rural India." *Studies in Family Planning* 39(3):177-186.

Stephenson, R., M.A. Koenig, and S. Ahmed. 2006. "Domestic Violence and Contraceptive Adoption in Uttar Pradesh, India." *Studies in Family Planning* 37(2):75–86.

Stone, L. 1978. "Cultural Repercussions of Childlessness and Low Fertility in Nepal." *Contributions to Nepalese Studies* 5(2):7-36.

Subedi, B.P. 1998. "Regional Patterns of Fertility." *Contribution to Nepalese Studies* 25(Special Issue):146-156.

Suwal, J.V. 2001. "Socio-Cultural Dynamics of First Birth Intervals in Nepal." *Contribution to Nepalese Studies* 28(1):11-33.

Tam, V.C.and D. Detzner. 1998. "Grandparents as a Family Resource in Chinese-American Families." Pp. 243-263 in *Resiliency in Native American and Immigrant Families*, edited by H.I. McCubbin, E.A. Thompson, A.I. Thompson, and J. Fromer. Thousand Oaks, CA: Sage.

Teachman, J.D. 1983. "Analyzing Social Processes: Life Tables and Proportional Hazard Models." *Social Science Research* 12(3):263-301.

Thibaut, J.W. and H.H. Kelley. 1959. *The Social Psychology of Groups*. New York: Wiley.

Thornton, A. 2001. "The Developmental Paradigm, Reading History Sideways, and Family Change." *Demography* 38(4):449-465.

—. 2005. *Reading History Sideways: The Fallacy and Enduring Impact of the Developmental Paradigm on Family Life*. Chicago: University of Chicago Press.

Thornton, A., W.G. Axinn, and J.D. Teachman. 1995. "The Influence of School Enrollment and Accumulation on Cohabitation and Marriage in Early Adulthood." *American Sociological Review* 60(5):762-774.

Thornton, A., M.-C. Chang, and T.-H. Sun. 1984. "Social and Economic Change, Intergenerational Relationships, and Family Formation in Taiwan." *Demography* 21 (4):475-499.

Thornton, A., and H.-S. Lin. 1994. *Social Change and the Family in Taiwan*. Chicago: University of Chicago Press.

Tone, A. 2001. *Devices and Desires: A History of Contraceptives in America*. New York: Hill and Wang, a division of Farrar, Straus and Giroux.

Tuladhar, J.M. 1989. *The Persistence of High Fertility in Nepal*. New Delhi: Devendra Printers.

Turner, R.H. 1970. *Family Interaction*. New York: Wiley.

United Nations Development Programme (UNDP). 2000. "Human Development Report 2000." New York: Oxford University Press.

—. 2001. "Nepal Human Development Report 2001." Nepal: Jagadamba Press.

Varghese, R.P. 2009. "Welfare consequences of coresiding with the mother-in-law in patriarchal joint families for women and children: Evidence from India and Bangladesh." Dissertation, Public Policy, The University of Chicago.

Waite, L.J.W., F.K. Goldscheider, and C. Witsberger. 1986. "Nonfamily Living and the Erosion of Traditional Family Orientations Among Young Adults." *American Sociological Review* 51(4):541-554.

Waszak, C., L.J. Severy, L. Kafafi, and I. Badawi. 2001. "Fertility Behavior and Psychological Stress: The Mediating Influence of Gender Norm Beliefs Among Egyptian Women." *Psychology of Women Quarterly* 25(3):197-208.

Wilson-Williams, L., R. Stephenson, S. Juvekar, and K. Andes. 2008. "Domestic Violence and Contraceptive Use in a Rural Indian Village." *Violence Against Women* 14(10):1181-1198.

Wingood, G.M. and R.J. DiClemente. 1998a. "Partner Influences and Gender-Related Factors Associated With Noncondom Use Among Young Adult African American Women." *American Journal of Community Psychology* 26(1):29-51.

—. 1998b. "Rape among African American Women: Sexual, Psychological, and Social Correlates Predisposing Survivors to Risk of STD/HIV." *Journal of Women's Health* 7(1):77-84.

Wood, K. and R. Jewkes. 1997. "Violence, Rape and Sexual Coercion: Everyday Love in South Africa." *Gender and Development* 5(2):23-30.

Yabiku, S.T. 2004. "Marriage Timing in Nepal: Organizational Effects and Individual Mechanisms." *Social Forces* 83(2):559-586.

—. 2005. "The Effect of Non-Family Experiences on Age of Marriage in a Setting of Rapid Social Change." *Population Studies* 59(3):339-354.

—. 2006. "Neighbors and Neighborhoods: Effects on Marriage Timing." *Population Research and Policy Review* 25(4):305-327.

Yamaguchi, K. 1991. *Event History Analysis*. Newbury Park, CA: Sage Publications.